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Managing Director Raz Islam | +971 50 451 8213 raz.islam@cpitrademedia.com **Nominations**

Editorial Director

Vijaya Cherian | +971 55 105 3787 vijaya.cherian@cpitrademedia.com **Information**

Marketing Manager

Sheena Sapsford | +971 4 375 5498 sheena.sapsford@cpitrademedia.com



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WELCOME



ME. Last month I attended Arabsat's Broadcast Forum in Salalah, Oman, It was a wonderful experience to meet so many broadcasters and partners, and gain valuable insight into the issues that the industry is currently facing, as well as the solutions to remedy them. For instance, the issue of pirate channels has been the scourge of the industry for years, but following the efforts of the anti-piracy coalition a lot of channels have been taken off-air. This is not to say that more won't pop up, but the commitment to fight this is truly commendable.

An issue that I am very passionate about is animal conservation. I think you will love the feature about how Yahsat is helping conserve lions in Africa, and how alongside it, the Maasai are getting recieving to education through satellite.

There's an inherent feeling of satisfaction that the industry that I work in is able to reach out and help, and for that I am grateful.

Furthermore, with the emergence of big data and IoT, machine learning has become very important. This isn't going to be a Skynet situation, but rather something to complement the human workforce. What are your thoughts about having a digital assistant and augmented intelligence?

I'm also very excited to see you at our awards on the 14th of this month. Wear your best suit because it will definitely be a star studded night to remember.



CLAYTON VALLABHANEditor
SatellitePro ME

SATELLITEPRO

CPI TRADE PUBLISHING

PUBLISHING DIRECTOR

RAZ ISLAM
raz islam@cpitrademedia.com

+971 4 375 5483

EDITORIAL DIRECTOR

VIJAYA CHERIAN

vijaya.cherian@cpitrademedia.com +971 4 375 5472

EDITORIAL

EDITOR

CLAYTON VALLABHAN
clayton.aldo@cpitrademedia.com
+971 4 375 5479

SUB EDITOR

AELRED DOYLE

aelred.doyle@cpitrademedia.com

ADVERTISING

GROUP SALES DIRECTOR

SANDIP VIRK

sandip.virk@cpitrademedia.com +971 4 375 5483

+971 50 929 1845

DESIGN

ART DIRECTOR

SIMON COBON

simon.cobon@cpitrademedia.com +971 4 433 2849

DESIGNER

LUCY MCMURRAY

MARKETING

MARKETING MANAGER

Sheena Sapsford sheena.sapsford@cpitrademedia.com +971 4 375 5498

CIRCULATION & PRODUCTION

DISTRIBUTION MANAGER

SUNIL KUMAR sunil.kumar@cpitrademedia.com +971 4 375 5476

PRODUCTION MANAGER

VIPIN V. VIJAY vipin.vijay@cpitrademedia.com +971 4 375 5713

WEB DEVELOPMENT

MOHAMMAD AWAIS SADIQ SIDDIQUI

FINANCE

ACCOUNTS

NAHEED HOOD naheed.hood@cpitrademedia.com +971 4 375 5474

CREDIT CONTROL EXECUTIVE

CAMERON CARDOZO cameron.cardozo@cpitrademedia.com +971 4 375 5499

FOUNDER

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UPDATE

Eurochannel upgrades to HD on Eutelsat

CONTRACTS

Eurochannel has announced its upgrade from standard to HD with Eutelsat. Already a direct customer of Eutelsat for the last five years, the channel is now expanding its capacity on the high-power EUTELSAT 16A satellite to launch its HD version for European viewers

its HD version for European viewers. **EUTELSAT 16A** is positioned at Eutelsat's 16° East key neighbourhood, a preferred location for TV distribution to terrestrial networks across Europe, from Reykjavik to Moscow and Tenerife to Tbilisi. Eurochannel is currently received by more than 70 cable and IP operators in 17 countries across Europe and will leverage EUTELSAT 16A's reach to reinforce its European distribution, recently extended to Russia, Lithuania and Croatia. The upgraded HD channel will be uplinked from Bosnia via Eutelsat's partner teleport TEAM: MEDIA.

Eurochannel is dedicated to showing the diversity of European culture through films and series, as well as European fashion.

UAESA welcomes Kuwaiti delegation

MEETING

The UAE Space Agency welcomed an official delegation from the Kuwaiti scientific, research and academic institutions visiting the UAE this week to learn about the experience, achievements and future plans of the UAE space sector. The delegation included representatives from Kuwait University, Kuwait Advanced Technology Foundation and Kuwait Institute for Scientific Research (KISR).

The tour began at UAE Space Agency headquarters in Abu Dhabi, where the delegation was briefed on the agency's latest developments and the progress of its missions and projects, as well as achievements made at organisational, legislative, scientific and educational levels since the establishment of the agency.

Following the meeting, the delegation toured Yahsat Space Laboratory at Masdar Institute, Al Yah Satellite Communications Company (Yahsat) facilities, the Mohammed Bin Rashid Space Centre (MBRSC) and the Sharjah Centre for Astronomy and Space Sciences (SCASS).

HE Dr Eng Mohammed

Nasser Al Ahbabi, Director General of the UAE Space Agency, said: "Hosting the Kuwaiti delegation comes within the framework of the UAE Space Agency's strategic plans to enhance its links with prominent global and regional entities in the space sector. The agency is ready to cooperate with various Arab parties to develop joint projects capable of developing the current space capabilities."

"The delegation's visit today highlights several areas of cooperation for the near future, which comes in line with the agency's goals of uniting Arab efforts in the aim of launching joint space related projects," he added.



GBI partners with social media



CONTRACTS

GBI is teaming up with social media platforms, content delivery networks and global cloud providers in the Middle East. Regional users will now experience a faster connection to the media and content hubs.

Through its regional landing partners, fixed broadband and mobile network operators, GBI has access to reliable terrestrial in-country networks. As the only operator to provide diverse routing from Europe to all the countries of the Gulf and the lowest latency route between Europe and India, the network design uses the latest technology, including 40G and 100G.

"As more people adopt digitally-aided lifestyles, we are thrilled to partner with social media networks to enhance their users' experience, providing a faster and more reliable connection," said Amr Eid, CEO of GBI.



Eutelsat acquires Noorsat

ACQUISITION

Eutelsat has acquired NOORSAT, a satellite service provider in the Middle East, from Bahrain's Orbit Holding Group. Established in 2004, NOORSAT is the premier distributor of Eutelsat capacity in the Middle East, serving blue-chip customers and providing services for over 300 TV channels almost exclusively from Eutelsat's MENA neighbourhoods at 7/8° West and 25.5° East.

Michel Azibert. **Eutelsat Chief** Commercial and Development Officer, said: "NOORSAT's capabilities and market knowledge will further consolidate our longstanding position in the dynamic Middle East video market. By integrating NOORSAT's service platform and teams, we are underlining our commitment to serving customers in one of the key markets within our global footprint."

Third set of Iridium NEXT satellites reach orbit

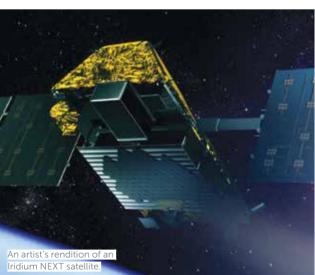
NEW SATELLITE

Iridium Communications announced that the third set of 10 Iridium NEXT satellites, launched on 9 October by SpaceX, are functioning nominally and have begun the testing and validation process. This batch of 10 satellites was launched from Vandenberg Air Force Base in California, increasing the total number of Iridium NEXT satellites in space to 30.

"Since Monday's success, all things are pointing positive," said Scott Smith, Iridium COO. "The team at the Satellite Network Operations Centre (SNOC) is ready and has already been working around the clock since their deployment Monday. Unlike previous launches,

where some satellites were sent drifting to their operational orbital plane, all 10 satellites from this launch will go directly into operation once testing is completed. This phase of satellite manoeuvres and testing is where the Iridium satellite network operations teams truly shine."

For approximately the next 45 days, these newly launched satellites will undergo a series of testing and validation procedures, ensuring they are ready for integration with the operational constellation. Once testing is completed, Iridium will also hand over control of Aireon's Automatic Dependent Surveillance-Broadcast hosted payload to the team at Aireon's Hosted Payload Operations Centre (HPOC).



Thuraya partners with Gulfsat



PARTNERSHIP

Thuraya has announced the signing of a partnership with satellite communications company Gulfsat to launch data services in Kuwait. The partnership allows the companies to combine interests and increase both their distribution channels.

The new agreement gives Thuraya a data service presence in Kuwait for the first time and enhances broadcasting capabilities, backed by Gulfsat's media broadcasting influence.

Danny COTE, CCO at Thuraya, said: "We are delighted to work with Gulfsat, through whom we are able to gain a foothold in Kuwait and extend services into some of the country's key sectors, including its prominent maritime market. Together, our joint offerings will also facilitate the remote operational capabilities of the Middle East and **North African utilities** and oil & gas sectors."

UAESA signs MoU with Luxembourg

PARTNERSHIPS

The UAE Space Agency has signed an MoU with the Government of the Grand Duchy of Luxembourg, defining a framework for collaboration and the exchange of information and expertise in the fields of space science, research and technology.

The MoU was signed by HE Dr Ahmad Belhoul Al Falasi, Minister of State for Higher Education and Chairman of the UAE Space Agency, and Etienne Schneider, Deputy Prime Minister and Minister of the Economy, Internal Security



and Defence of the Grand Duchy of Luxembourg.

The MoU was part of an official visit to Abu Dhabi by a high-level delegation from Luxembourg, headed by HRH Prince

Guillaume, Crown Prince of Luxembourg, and including HRH Princess Stephanie, Crown Princess of Luxembourg, and Elisabeth Cardoso, Ambassador of Luxembourg to the UAE. The delegation met with distinguished UAESA officials including HE Dr Al Falasi and HE Dr Eng Mohammed Al Ahbabi, DG of the UAE Space Agency.

HE Dr Al Falasi said:
"Our agreement with the
government of the Grand
Duchy of Luxembourg falls
within the strategic visions
of both the Space Agency
and the UAE. This includes
working towards closer
international cooperation,
establishing mutually
beneficial international
partnerships and exchanging
scientific knowledge with
the rest of the world."

Thuraya showcases new services to Police Air Wina

NEW SERVICES

Thuraya held meetings with senior officials from the Abu Dhabi, Dubai and Sharjah Police Air Wings to showcase a suite of satcom products and services. As the main MSS operator in the country, the company has worked with local law enforcement teams before and was pleased to present solutions for the departments' upcoming plans to extend mobile services, patrolling activities and response operations. Thuraya also discussed recent advancements in M2M services that could facilitate IoT plans for enhanced civil defence capabilities.

Muhsen Al Kait. **Business Development** Manager at Thuraya, who represented the company at the roadshows, said, "Part of our vision as a **UAE-based company is to** empower and add ease to any development initiative in the country, especially in regard to safety and security measures. We had a very positive response after meeting with senior enforcement officials from three different emirates, and look forward to further discussing how we can work together in their city-wide endeavours."

Products included the IP+ and IP Voyager, satellite phones like the XT series of handsets and Thuraya IP M2M.

SES Video hires two senior members of staff



NEW APPOINTMENTS

Two new senior appointments will bolster SES Video's growth strategy and enhance support for the evolving needs of video and media customers in the fast-growing Asia-Pacific video market. SES announced that SES Video has welcomed to the fold experienced industry professionals Yew Weng Soo as Vice

President, Sales & Market Development, and John Huddle as Director, Market Development for Asia-Pacific.

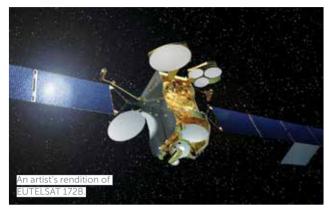
Yew Weng Soo brings more than 25 years of industry experience to his new role at SES Video, driving business strategy, commercial activities and creation of new value-added solutions for customers in Asia-Pacific.

Eutelsat 172B reaches GEO orbit

NEW SATELLITE

The EUTELSAT 172B spacecraft built by Airbus for Eutelsat has now reached geostationary orbit, breaking the record for the fastest satellite electric orbit raising (EOR).

The Airbus spacecraft control centre in Toulouse took control for early operations, initialisation and deployment of the solar array and electric propulsion arms, and completed initial testing prior to starting EOR on 8 June. During this fourmonth phase, electric thrusters smoothly and efficiently propelled the satellite to the targeted



orbit, consuming almost six times less propellant mass than for a satellite with chemical propulsion.

Following completion of the payload in-orbit tests and drift to its operational location led by the Eutelsat team, EUTELSAT 172B is scheduled to enter commercial service in November to provide enhanced telecommunications, in-flight broadband and broadcast services.

"We are the first company to demonstrate full electric propulsion for satellites of this size and capacity, enabling their launch in the most cost-efficient manner. Furthermore, with our system design, operation strategy and the plasma thruster technology we implement, we have completed the fastest electric orbit raising ever from transfer to geostationary orbit, which will allow Eutelsat to put their electric satellite in service in a record time," said Nicolas Chamussy, Head of Space Systems at Airbus.

UAE researchers submit space studies at IAC

SPACE STUDIES

Delegates from the UAESA and MBRSC presented eight unique academic papers to the 68th International Astronautical Congress (IAC), providing insight into the recent successful experiences of the UAE space sector and programme. The Space Agency delegation, which exhibited and participated in events throughout the IAC, was led by HE Dr Ahmad Belhoul Al Falasi, Minister of State for Higher **Education and Chairman** of the UAE Space Agency.

HE Dr Eng Mohammed Nasser Al Ahbabi, Director General of the UAE Space Agency, said: "The



agency's participation in the international space event was essential, due to the rapidly changing nature of space science and exploration. We intend to support the space sector in the UAE with the latest international developments, which will be reflected on existing and future projects."

BBC Arabic renews agreement with Arabsat

CONTRACTS

BBC Arabic television has announced the long-term renewal of its agreement on Arabsat BADR-4 at 26°E, which covers the entire MENA region and most of Western Europe. The service will continue to be offered on the frequency on Arabsat BADR-4.

BBC Arabic extends its commitment to Arabsat at 26°E as a key means of reaching its audience across the MENA. This new contract will extend the partnership to 15 years of delivery of free-to-air radio and television services.

Sam Farah, Head

of BBC Arabic, said:
"It is good news that
we are continuing
this partnership and
continuing to reach our
audiences in these places.
BBC Arabic TV will be
bringing viewers new
programmes as well as
their existing favourite
flagship shows."

"This move supports our content strategy to deliver specialised video frequencies reflecting market demand to Arabsat audiences across the MENA and Europe, ensuring the best free-to-air viewing experience at home," said Khalid Balkheyour, Arabsat President and CEO.





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CELEBRATING SUCCESS

Arabsat's 9th Atheer Customer Broadcasting Forum was a roaring success, with dignitaries including ministers and high-ranking government officials in attendance



Salalah is an extremely popular tourist destination for people looking to relax and put their feet up. Whether it's the pristine beaches where fishermen still haul in the catch of the day at the crack of dawn, or the lush plantations dotted with banana and coconut trees, Salalah has a spot for anyone looking to be one with nature.

The forum started with Khalid Balkheyour, President and CEO of Arabsat, addressing the honoured guests and customers and thanking them for their continuing support. He extolled the virtues of growth at the 26-degree East position and explained plans for expansion and integration within the Arab community.

Wael Al Buti, VP and CCO of Arabsat, also gave a presentation on how the orbital position is growing, with more broadcasters coming onboard and MBC holding the exclusive rights for transmission of Saudi Football League matches. He said there are more than 170 channels in HD on Arabsat satellites, and he only sees that number growing in the coming years. He also explained that because of the growing number of exclusive channels on 26-degrees East, 78% of households across the GCC have their dishes turned to this position.

Vidya Subramanian Nath, Research Director at Frost & Sullivan gave an interesting presentation. It offered insights into MENA TV viewing habits. For instance, there are 66m TV households in the region and 62% of these households have HDTV sets. Furthermore 77% TV viewing is through satellite, and only 11% of viewers subscribe to Pay-TV services.

Another presentation by Elie Aoun, CEO Middle East, Africa and Pakistan (MEAP), Ipsos Connect revealed some amazing numbers on advertising expenditure in the MENA region.

The total offline media spend in 2016 was \$21.2b, and for this year figures till August stood at \$14.2b.

The sector that invested the most in advertising on TV was the

beauty and hygeine sector, making up 13.2% of revenue. This was followed by foodstuff and leisure at 11.7% and 10.1% respectively.

The forum also featured a host of panel discussions, including one on why customers prefer 26-degrees East, the outlook and opportunities for broadcasting in the MENA, various broadcasting technologies and how they can benefit broadcasters, and lastly the effect of digital disruptors on traditional broadcasting.

Arabsat has always provided access to strong technical support and has a firm drive to back anti-piracy measures.

When MyHD came to Arabsat, it was the first pay-TV service to launch at 26-degrees East. Since then, more have joined. A lot of Arabsat customers had much to say about why they chose 26-degrees East and stuck to it.

Samir Safer, CEO of MyHD, said: "When you decide to launch a new pay-TV platform, you try to find strong partners. Now most channels want HD-quality content streamed. Arabsat has been a great partner for bringing HD to the region. We have



a reach in 22 countries for our lowcost pay-TV platform. Arabsat has an upgraded fleet with new satellites.

"The aim for us was to have customers have a small dish antenna and get HD channels at a low cost. After five years, we have grown significantly in this position. We needed to get good content, and then adoption was imminent. We also started with different packages for different regions. We started MyArab for GCC countries, and we launched different packages for Indians and Filipinos living in the region too. We also launched a new package for Maghreb."

During the last Atheer in Marrakech, people were talking about MBC moving towards the Badr location at 26-degrees East, away from 7/8-degrees West. Part of the reason for this was to give advertisers a more targeted footprint to invest. This is because advertisers are not necessarily interested in the entire MENA, but are more inclined to advertise in a smaller geographical area.

Sam Barnett, CEO of MBC, said: "One of the things about moving satellites is that people thought we would lose audience on the way. We still have a good audience share and are still getting advertising. It has been difficult to say if advertising on spot beams has been successful. We are getting there, but it's too early to say for now."

David Couret, Director Technical Solutions – Distribution, France24, said: "Maghreb is becoming a big region for Arabsat, and this is a region where France24 also wanted to increase its presence. There are also a lot of good-quality entertainment channels on the hotspot. This is why we wanted to migrate onto the 26-degree position."

In the case of BBC Arabic, the trigger was not advertising, but rather getting more concentrated eyeballs in the MENA region.
Nigel Fry, Head of Distribution at



Our aim is to attract more channels to the region on Arabsat and serve the viewers in the region. As far as entertainment content, we have MBC on Arabsat as a whole bouquet, and we're getting many more exclusive channels"

Khalid Balkheyour, President and CEO, Arabsat

BBC Global News, explained: "We produce content in 41 languages, and at the moment we are reaching 346m people worldwide. Of the viewers we have, there are 43m in the Arab world, so it's a big market for us."

"What is interesting is how dominant satellite is in this market, and we've seen in various markets the emergence of internet and the use of mobile devices as a way of people accessing content. From a traditional broadcast perspective, it's quite reassuring to see satellite in such a strong position. Furthermore, the internet is only useful for those who can afford to use it. Satellite TV broadcasts reach further."

On the technological front,

at the 26-degrees East position Selevision has introduced a lot of new technologies in order to enrich the viewing experience.

CEO Dr Raed Khusheim explained: "Satellite channels have been moving from analogue to DBV-S, and now we can see several channels in DVB-S2. Arabsat has been a great partner for us because we focus more on technology, and they have been facilitating a lot of bandwidth and knowledge.

"Soon we will be going forward with DVB-S2X and GSEU, which is generic streaming encapsulation. This is all apart from HEVC and 4K channels. The facilitation and the partnership we have with Arabsat is very important to us, and we can see this help with a dynamic and targeted advertising approach.

"There must be a collaboration with STB manufacturers, but the approach which we are working on with Arabsat is sat to IP. This is very important, for instance, in the hospitality industry, where they might have to receive signals through an encoder and then push those to a smart TV or a smartphone."

The 26-degrees East hotspot is a healthy community with two different operators at the orbital position. This has made the position stronger, and more people have turned their dishes towards 26-degrees East because beIN Sports moved a lot of channels from 7/8-degrees West. A lot of broadcasters in the region supported this as a wise move at the time.

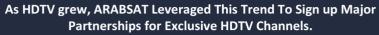
Balkheyour said: "We realised that sports channels and entertainment were the most attractive, whether they are pay-TV or FTA. This is why we moved them on 26-degrees. We were also keen for Es'hailSat to be on the 26-degrees East position. Es'hailSat has its own satellite with its own content, and the unfortunate political situation has not negatively affected existing channels.

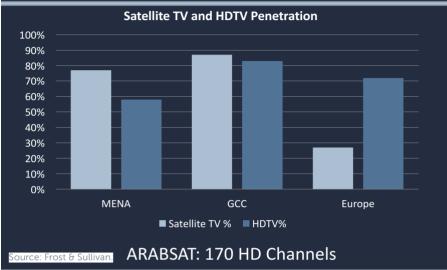
"This is a concern I respect, but I don't see any need for fear. They are two separate satellites at the same location, addressing the same audience. Our aim is to attract more channels to the region on Arabsat and serve the viewers in the region. As far as entertainment content, we have MBC on Arabsat as a whole bouquet, and we're getting many more exclusive channels. We are also getting many exclusivity rights for sports broadcasts on Arabsat.

"The situation hasn't really affected the broadcasters that are with us, and there is no need for them to be worried. We have contractual commitments with our clients, and we respect those, while we expect them to respect the content we agree on with intellectual rights and copyrights."

Another core concern is piracy, a topic central to the success of television and a struggle, especially in this region. Arabsat and MBC have been working hard after forming the anti-piracy coalition to eradicate all forms of piracy on channels broadcast via satellite.

Barnett said: "Piracy on satellite can be a big issue. Within a couple of months, there were 75 channels with pirated sports and movies. This was content we paid for and was being played for free on satellite channels.





Source: Ipsos Connect.

One of the reasons we are so close to Arabsat is because we went to them and said we want to start a coalition to fight piracy, and asked if they would support us. It didn't take even 30 seconds for them to say yes. Arabsat has fought with us against this scourge for the past five years. In the last few months, we have taken 45 pirate channels off the air from 7-degrees West. For the first time as an industry, we're now clean."

"Online piracy is something much bigger. This takes all the paid

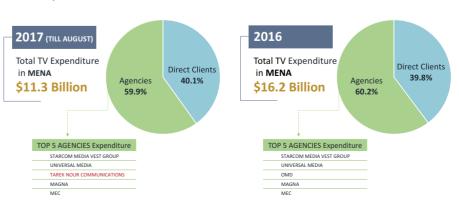
sports channels and streams them for free. This is not attacking just beIN but it attacks all of us, because it's pushing people from satellite to online. There is a range of them. Every time we hit an unauthorised online portal we make satellite stronger, and this will help all of us."

Arabsat has some Ka-band capacity at the 26-degrees location, and many don't know it is used to reduce jamming and interference.

"When people hear about Ka-band, they think of broadband and high throughput, as well as being a smaller spot beam which is focused on a particular geographic location. However, when we planned for 26-degrees East, we thought in terms of protecting some of the channels from interference, and we built the option for Kaband in Badr-5 and Badr-7.

"This allows the broadcaster to uplink on Ka-band, and downlink on MENA coverage using Ku-band. This protects the signal from jamming or interference on the uplink. This was our idea in protecting broadcasters from interference from different locations around the world," concluded Balkheyour.

TV Expenditure





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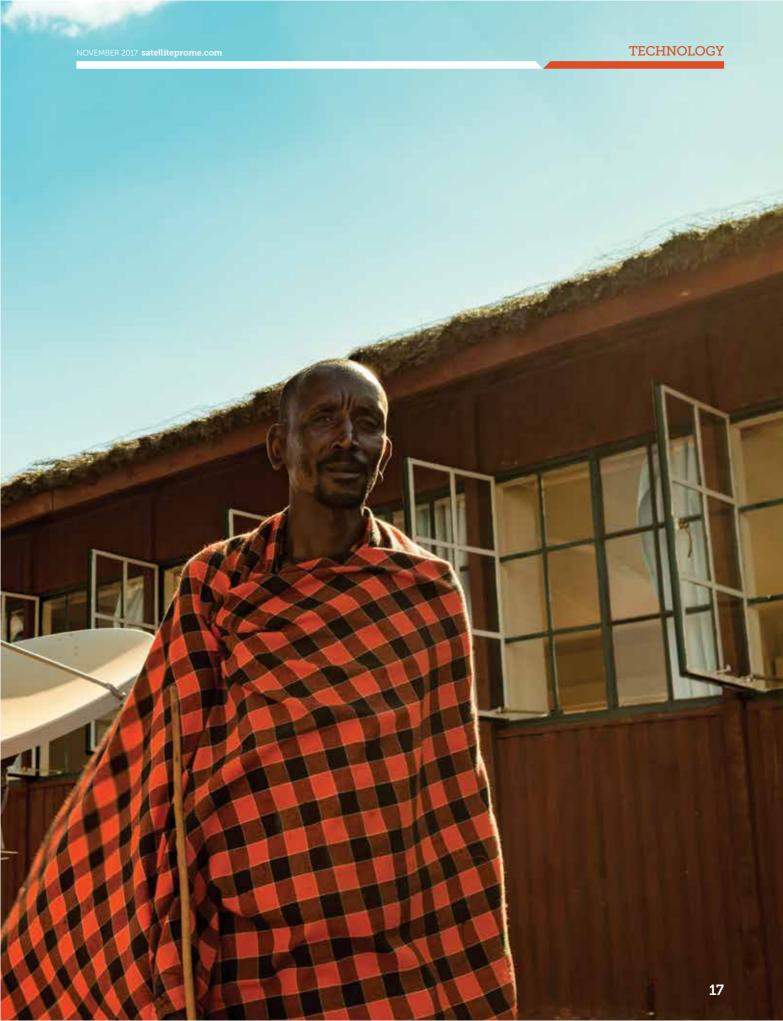




TECHNOLOGY

TECHNOLOGY FOR CONSERVATION





For the Masai that inhabit the beautiful plains and savannahs of Kenya and Tanzania, lion hunting is part of their culture, and more importantly an integral part of the people and their livestock.

It is considered a rite of passage for young Maasai warriors, but it must be understood that the tribe does not actively seek out lions to kill. According to Maasai traditions, it is only when a lion attacks a tribe member's cattle that the predator is hunted down. Lionesses and sick members of the pride are forbidden to be attacked either.

Today however, urbanisation has begun chipping at the habitat. With less land to occupy, lion attacks on cattle have increased. The Maasai, in turn, have hunted the lions. As a consequence, populations of the great cat have plummeted from over 100,000 to approximately 15,000 in recent decades.

Active conservationists have tried to tread the fine line between keeping the Maasai tradition alive, yet introducing technology that will help restore balance.

Enter Yahsat. The UAE-based satellite operator is trying hard to connect some of Africa's remotest areas, with the push for satellite broadband in the form of YahClick.

Farhad Khan, CCO, Yahsat, says: "For the Maasai, we've been able to bridge two gaps. One is the focus on endangered wildlife species and the other is the advancement of a community of people who for generations

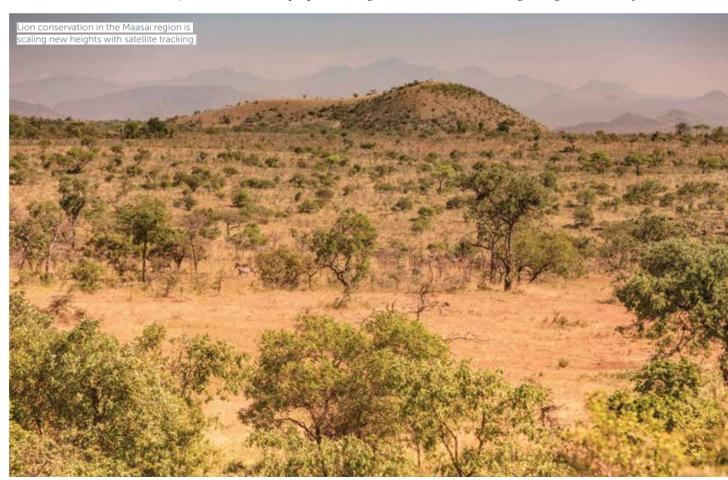
and decades have predominantly been left on the fringe of society for a variety of reasons."

Yahsat has joined hands with conservationists in the region to help monitor lions that pose a threat to the Maasai tribe.

One such conservationist is Luca Belpietro, the founder of Campi ya Kanzi, an eco-lodge in the Chyulu Hills of southern Kenya, and a career conservationist. Belpietro moved to Kenya in 1997 and has made it his life's purpose to save the lions.

While it offers luxury and outdoor adventure to its visitors, the lodge's primary aim is to spread conservation and leverage tourism to protect the local landscapes and Maasai tribes.

Living amongst a community



of 17,000 Maasai, Belpietro has observed the massive imbalance in the protection of wildlife.

"75% of the wildlife has already been known to live outside of the protected area of national parks and game reserves. Thus, it was quite obvious to me that there would not have been successful conservation policies, if wildlife that was living in private land was not addressed," explains Belpietro.

Yahsat also partners with the Maasai Wilderness Conservation Trust (MWCT) across several initiatives.

The Maasai must co-exist not only with lions, but cheetahs, wild dogs and hyenas. It's the work of the MWCT on the ground that has paved the way for success in dealing with such dangerous predators.

"If you protect lions you can attract tourists," says Belpietro.

"This income creates employment with the lodge and creates a bunch of side benefits like compensation of livestock killed."

To protect the lions from the Maasai, and vice versa, the MWCT must monitor the movement of the prides using satellite-tracking technology.

By providing broadband coverage to a vast area of land previously unconnected, Yahsat's YahClick service has revolutionised conservation and the protection of wildlife where the Maasai dwell.

"We've been able to do this mainly because of our footprint in Africa. We cover almost 65% of the population with the launch of Al Yah 3, using technology that our competitors can never match, because with satellite technology we are able to go almost anywhere where we have a footprint. This allows us to cover people who don't even have access to electricity," explains Khan.

Seven lions in total are currently collared by the MWCT, two



For the Maasai, we've been able to bridge two gaps. One is the focus on endangered wildlife species and the other is the advancement of community of people who for generations and decades have predominantly been left on the fringe of society for a variety of reasons"

Farhad Khan, CCO, Yahsat

with the old VHF collar and five with satellite collars, tracked by ground staff via the connectivity provided by the YahClick service. The benefit of the latter is that it locates the exact positions of the lions, and warns the tribe's people of lurking predators.

Khan believes that Yahsat has had to battle outdated preconceptions on how complex or expensive satellite technology is to get their message across.

"It is literally plug and play," says Khan.

"We are facing a mental barrier that we have to overcome with our subscribers and potential subscribers or with the communities at large. They are used to satellite technology costing an absolute fortune. They're also used to, when you mention satellite technology, seeing a massive dish, almost the size of a swimming pool."

In reality, with the HTS technology that Yahsat uses, the dish can have a radius 30cm, on average the same size, if not smaller, than a TV satellite dish. Cost of equipment and installation is now a fraction of what it used to be, and is comparable to the price of a smartphone.

It's a challenge that Yahsat has been overcoming in various fields including education, healthcare, government services and more recently, hospitality and conservation.

"The Maasai people are fully part of the equation. They are profit sharers of the hospitality environment and receive healthcare treatment on an ongoing basis. We found a way to embed ourselves in 360-degree ecosystem." says Khan.

Samson Parashina, a Maasai, is the Chairman and President of the MWCT.

"For us, the Maasai, we have always seen people come and work in our land, thinking that the land is being taken away from us. Hence, the challenge for the Maasai was to accept the idea. It took them a very long time, until they've seen that there is some economic benefit that is coming to them," explains Parashina.

The new technology has transformed the environmental landscape, according to Parashina.

"YahClick helps us reduce conflict," he says.

"The Simbas, the rangers who follow the movements of the wildlife through satellite



connections, are able to know which pride of lions is where. The rangers can then go and alert the community."

The Future

Belpietro sees only positive signs as the MWCT looks to build relations with more partners.

The Massachusetts Institute of Technology (MIT) media lab has shown an interest in being involved in the project, while the MWCT – which already provides 47 scholarships – is also in talks with Alexandria State University, which is keen to offer online degrees for Maasai students.

Belpietro also believes the endeavours of the MWCT provide a window for the world to see the work they carry out and a way for the Maasai to learn about the world beyond.

"The outside world is not the challenge; the outside world is the opportunity. The Maasai are very proud of what they are, and they simply need to learn from the mistakes made by other communities in other nations. Connectivity is the key to the future," concludes Belpietro.



We cover almost 65% of the population with the launch of Al Yah 3, using technology that our competitors can never match, because with satellite technology we are able to go almost anywhere where we have a footprint. This allows us to cover people who don't even have access to electricity"

Farhad Khan, CCO, Yahsat



Khan echoes Belpietro's view, calling this partnership with the Maasai 'a brilliant marriage' of tradition and technology.

"This is exactly how Yahsat has designed the YahClick product, to actually integrate into communities. The Maasai have a rich and ancient culture," explains Khan.

"We know that the ability to hold onto the Maasai heritage and history is critical to the identity of the community, as is the ability to preserve their traditions, while also ensuring they embrace the technology and be as forthright and ahead of other communities. They should not remain steeped in traditions and ages past," he concludes.

POWERFUL AMBITIONS

On November 4, 2017, RSCC celebrates its 50th anniversary. It handles a satellite constellation of 12 spacecraft, as well as five teleports. Clayton Vallabhan speaks to RSCC Director General Yuri Prokhorov to learn more about the company's activities and market vision



the first satellite network of the Orbita system was launched in the Soviet Union to deliver Central Television programmes from Moscow to Siberia, the Far East and Central Asia. In 1968, the Space Communications Station was set up, whose tasks included the operation and development of groundbased satellite communications equipment, the provision of Central TV programmes and telephone communication channels via satellites. Over the next 50 years, the Space Communication Station has grown into a fullfledged operator - the RSCC which today is one of the largest satellite operators in the world.

With each new generation of satellites, from Molniya ('Lightning'), Ekran ('Screen') and Gorizont ('Horizon') to Express (A through AM to the most recent AMU), RSCC capability has kept growing, and its services list expanding.

An important milestone for



RSCC was arranging satellitesupported television broadcasts of the Moscow Summer Olympics in 1980. To address the task, a Space Communications Centre (SCC) was set up in Dubna in the Moscow region, which remains the largest teleport in Russia and Eastern Europe.

Having built its own VSAT network in 2009, the RSCC started to actively pursue services based on VSAT technologies - data transmission and the internet - and communications and broadcasting services on sea vessels, including in the Arctic region.

In 2015, we pioneered Kaband satellite services in Russia, a totally new market in the country. Today, the length of the RSCC satellite network in Ka-band is 7,000km, arguably the longest satellite network in the world.

Over the past five decades, the company has transformed from a small teleport and a pioneer in the field of television broadcasting via an HEO satellite to a successful geostationary satellite operator with a presence in 52 countries and an integral part of the global satellite communications industry.

What have been the key achievements of RSCC over these 50 years?

I think the main result of our work is user satisfaction. From a satellite communication station whose tasks were strictly confined to just operating the facilities, the RSCC has developed into a fullfledged all-around operator. The enterprise survived and kept on developing in the period of the country's political system change and deep economic crisis. We also experienced a painful period of spacecraft failures in orbit and losses of satellites at launch. Today, the RSCC successfully operates in a highly competitive environment.

We have managed to become



Until 2025, the RSCC plans to build, launch and commission five spacecraft for geostationary orbit and four spacecraft in high-elliptical orbits, and we also plan to further develop the ground infrastructure"

Yuri Prokhorov, Director General, RSCC

an operator which is convenient to work with. Having staged a management revolution, we have developed into a client-oriented company that successfully competes with the world's satellite business big four. In today's open market, the Russian consumer and service providers in most cases choose RSCC services: 80% of Russian users work via domestic operators. At present, our spacecraft are highly competitive on the global market.

the RSCC's satellites and market presence? The RSCC fleet currently

What can you tell us about

includes twelve spacecraft in the geostationary orbit, located from 14° W to 145° E and covering the territories of Russia and CIS, Europe, the Middle East, Africa, Latin and South America, Asia and Australia. The RSCC satellite constellation includes multi-functional spacecraft of the Express-AM, Express-AMU and Express-A series, as well as the direct broadcast satellites Express-AT.

The harmonious combination of various orbital positions, the frequency bands, fixed and narrow beams with cross-strapping options, vertical applications and geographic areas, as well as a network of regional partners and teleports - all this offers a unique opportunity to provide communications and broadcasting services almost all over the globe.

The RSCC never stops to update its orbital constellation. In the period from 2013 to 2015, seven new satellites were successfully launched, and now the RSCC operates one of the youngest fleets, in which an average in-service period of a satellite does not exceed five years. This is highly appreciated by customers: they can sign longterm contracts with the confidence that they will not have to change the satellite in the near future.

The company also uses the most progressive solutions when ordering its satellites, including electric propulsion systems, high throughput Ka-band, frequency reuse and so on. Also, the RSCC operates five world-class teleports, providing two-way satellite communications, tracking, telemetry and monitoring for other satellite operators.

What is the company strategy, and what kind of services do you aim to provide?

Initially, the goal of the company was to satisfy the needs of Russian customers, but then RSCC began

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to offer international satellite capacity to domestic customers, subsequently turning into an international commercial operator. Today, about 40% of the company's revenues come from international sales. The RSCC is one of the key players in the Middle East market, providing support to its regional and European customers. In addition, the RSCC successfully operates in North and sub-equatorial Africa, South Asia and Latin America. In the international market, the company offers unique solutions to connect Europe, North Africa, the Middle East and southern Asia.

Long-term relations with our customers and flexibility in meeting their needs are the hallmark of the RSCC, which helps in making attractive marketbased optimised price-versusquality offers to customers.

From leasing the satellite segment, today we are proceeding to tackle complicated solutions and services, including corporate networks, mobile communications, massive broadband access and the company's proprietary television platform.

What are the main challenges facing the RSCC?

We see our main task as fully satisfying the needs of our customers. The deficit of satellite capacity in Russia which existed five years ago was overcome by bringing into orbit seven new RSCC satellites in the period from 2013 to 2015. The company's activities are now shifting to the area of providing value-added services based on complex combined solutions. New opportunities appear in the market at the interface of IT and communications. The future, in our opinion, belongs to the convergence of services. The social goals and rapidly changing needs of users are acquiring particular relevance. We plan to work in all geographically accessible markets, while continuing to develop vertically.

What are your plans for capital expenditure to build new satellites?

Until 2025, the RSCC plans to

build, launch and commission five spacecraft for geostationary orbit and four spacecraft in highelliptical orbits, and we also plan to further develop the ground infrastructure. The orbital frequency resource available for use in satellite communication networks will see a 1.7-fold increase. Two satellites

- Express-103 and Express-80

- are already in production.

The development of the

The development of the constellation will ensure the creation of a promising information and telecommunications infrastructure that will enable us to address tasks in the interests of economic development, public administration and security throughout the Russian Federation, including the Arctic zone, and to increase the RSCC presence in the international market.

What services does the RSCC primarily plan to develop?

In the past few years, the RSCC has made significant investments in the ground infrastructure of satellite networks, allowing us to enter new market segments where previously we had no presence. Last year, the RSCC fully commissioned its own network of high-speed satellite broadband internet access in the Ka-band. We have changed our approach to the provision of television services. Where originally we provided primarily satellite capacity to large pay-TV operators, we now rely on our own RSCC television platform to provide a comprehensive service to broadcasters in a single-window mode.

Another promising area has been the development of broadband access for mobile objects. Currently, we provide services for sea vessels in the Atlantic, Arctic and Pacific oceans, including access to the internet, reception of television programmes, video surveillance, weather data transmission and telephone communications.

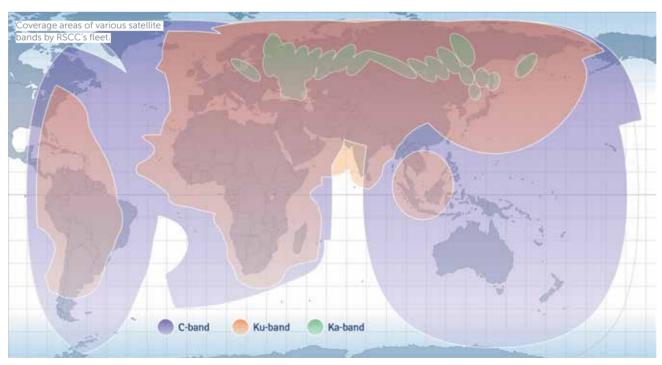
In its Development Strategy, RSCC concentrates on several high-tech areas which in the near future will undoubtedly have an impact on the structure of the satellite communications market in the face of growing market competition. They are: a) implementation of new projects involving new spacecraft in both the geostationary and highly elliptical orbit (HEO) to address priority tasks of fixed and mobile satellite communications for government and commercial customers in Russia, including the Arctic region; b) adaptation of the existing space and ground infrastructure of the company to handle new tasks of providing communication of mobile objects and the developing market of large data, including the Internet of Things.

What does the RSCC expect to achieve by the end of 2017, and in the next five years?

Last year, when earnings of most international satellite operators were plummeting, the RSCC demonstrated good revenue growth, which in rubles increased by 24%. The main task of the RSCC until the end of 2017 is to maintain business growth and meet the

planned revenue targets in the conditions of industry stagnation.

The entire satellite communication industry is going through a difficult period. The offer of satellite capacity considerably exceeds demand, competition of satellite operators against FOL is getting tougher, and new national operators are emerging, complete with their own space vehicles. In these circumstances. it is essential that we retain the current client base, primarily in the home region, and that we support organic development and access new geographical and vertical markets. Particular emphasis should be placed on increasing the share of highmargin services, such as maritime VSAT. For example, the RSCC is developing its communication and broadcasting services along the Northern Sea Route, which is becoming an increasingly busy area of navigation. To advance communications in the Arctic, in addition to GEO satellites, we plan to use spacecraft in the HEO. PRO



COMMS NEWS



NOVEMBER 2017 satelliteprome.com

Batelco Bahrain appoints a new CEO

APPOINTMENT

Batelco Group has announced the appointment of Mohamed Bubshait as Batelco Bahrain's new CEO. Bubshait joins Batelco from the Bahrain TRA, where he held the role of General Director.

His career in the communications industry spans several years, including a number of years in senior roles with Batelco prior to joining the TRA.

Bubshait brings a wealth of knowledge and relevant experience that will be invaluable as Batelco continues its evolution as the leading digital solutions provider in Bahrain. Chairman Shaikh Mohamed Bin Khalifa Al Khalifa said he welcomed Mohamed to Batelco Bahrain and looked forward to working alongside him to ensure the delivery of Batelco's future goals.

Etisalat launches first IPX Exchange platform in MEA

IPX EXCHANGE

Etisalat announced the official launch of the first IPX Exchange platform in the Middle East and Africa (MEA) region to support IPX traffic exchange, an integral part of SmartHub services. The official launch was made in the presence of senior Etisalat executives at the 13th Telecoms World Middle East, an industry event that gathers experts from across global markets.

IPX Exchange is a platform through which mobile carriers, CDN, cloud players and ISPs can interconnect and exchange Ethernet traffic and roaming traffic, using MPLS (Layer2 and Layer3) among their networks.

Ali Amiri, Etisalat Group Chief Carrier and Wholesale Officer, said: "The launch of the first IPX Exchange is an achievement, as it sets a benchmark for Etisalat and the industry. The exchange will give our customers a high-quality service in terms of flexibility of speed and accessibility. The IPX exchange will add value to the SmartHub data centre's services and to our customers by providing them better connectivity and a reliable platform, also adding new facility to the existing platforms in the United States, Europe and Singapore."

SmartHub is powered by many platforms including submarine systems, capacity structuring and IX, all of which serve carriers and ISPs for carrier grade services. The latest IPX/ GRX exchange platform will power SmartHub to also serve mobile carrier operators.



STC signs deals with new vendors



CONTRACTS

STC signed major agreements with a number of international companies (Nokia, Ericsson, Huawei) on the margin of GITEX 2017. The first agreement was signed with Nokia to boost mobile broadband capacity and coverage in Saudi Arabia using Nokia's 4.5G-Pro technology. The agreements were signed by Emad A. Alaoudah, Procurement and Support Services Sector VP at STC. in the presence of Dr Khaled H. Biyari, STC Group CEO.

The enhanced network will meet the everincreasing demands of end customers, including the millions of visitors who travel to Mecca and Medina each year, particularly during the Hajj and Ramadan seasons. Furthermore, the NB-IoT will enable STC network infrastructure to evolve into the new era of digitisation, a solid step toward the new programmable world.

Nokia and Zain complete LTE-U trial

TESTING

Nokia and Zain Saudi Arabia have successfully completed the Middle East's first trial of LTE-Unlicensed, combining unlicensed spectrum in the 5GHz frequency band with 1800MHz spectrum to deliver a downlink speed of 223MB/s. Following the trial, the Nokia technology will be deployed in hotspots, for example in malls and cafés in Jeddah and around the Holy Mosque in Makkah. Service providers like Zain are looking to technology innovation to serve the everincreasing data needs of their customers. LTE-U is one such approach, combining traditional LTE with LTE in



unlicensed 5GHz spectrum to enable service providers to deliver exceptional service quality without significantly increasing their spectrum expenses.

Small cells are integral to

successfully using unlicensed LTE, and Nokia's Flexi Zone multiband small cell technology will support Zain in significantly increasing downlink data rates for mobile devices while

also enhancing mobility, security and reliability of 4G/LTE connections.

Eng Sultan Abdulaziz AlDeghaither, Chief Technology Officer, Zain Saudi Arabia, said: "There has been exponential growth in the demand for high-speed mobile broadband services.

"This trial, with the support of our longstanding and trusted partner Nokia, is an important step in our commitment to adopt the latest technological solutions to provide innovative and best possible services to our subscribers. It will also give us a crucial competitive edge."

Vodafone Cameroon expands 4G network



4G EXPANSION

Vodafone Cameroon, part of the Afrimax Group, has expanded and enhanced coverage of its 4G LTE network to the towns and cities of Bafoussam, Bamenda, Buea, Edea, Kribi, Kumba, Limbe and Mutengene. The development follows the signing of a

'strategic national network sharing agreement' with CamTel last month, under which Vodafone is able to make use of the state-owned telecoms operator's existing network infrastructure in Douala and Yaounde and to expand its coverage to new locations across the country.

TP-Link Technologies appoints new distributor

NEW DISTRIBUTOR

TP-Link Technologies has appointed Assr Al Jawal as its distributor for the Neffos smartphone portfolio in the UAE. According to the vendor, which manufactures a broad range of products to the consumer, SOHO and SMB markets, including wireless solutions, ADSL, routers, switches, IP cameras, powerline adapters, print servers, media converters, network adapters and smartphones, the appointment paves the way for the company to further develop its business with independent retailers in the UAE.

In terms of the deal, Assr Al Jawal will supply independent retailers in the UAE with TP-Link's entire range of Neffos smartphones and accessories. Lucas Jiang, GM, TP-Link MEA FZE, said the company is delighted to have signed Assr Al Jawal as its distributor in UAE.

"By appointing Assr Al Jawal to distribute the Neffos range of smartphones and accessories.

"We believe our products can be distributed well across the market so that more consumers can buy our products easily," he said.

A.T. Kearney: Telecoms in growth support

RESEARCH

More than 80% of telecom executives in the SAMENA region believe future success and growth depend on making fundamental changes to their business and operating models, according to a recent report produced by management consultant A.T. Kearney in conjunction with the SAMENA Telecommunications Council.

The report, based on a recent survey of C-level executives from the region's leading telecom companies, highlights the importance of mastering customer retention and customer base value management to sustain returns. Simultaneously, diversification and development of new businesses is becoming increasingly important, with 85% of executives affirming that developing new business is critical to their company's success.

In terms of new consumer revenue sources, less than

a quarter of executives believe content or digital services will be important.

Simultaneously, to sustain competitiveness, telecom operators will continue focusing on operational efficiency (network, IT, overhead), although commercial-related costs will be less under scrutiny. The key driver, as A.T Kearney sees it, is the understanding that significant investment is needed to bring commercial operations into the digital age with upgrades to the customer experience such as online sales support and self-service via apps.

Marc Biosca, Partner, A.T. Kearney, said: "Telecom operators in the region are considering a wide range of changes to their operating model. The customer is at the epicentre of this strategy, as most operators and executives in the region believe that a differentiated and superior customer experience is a top priority."





Dejero Cellsat blends cellular and satellite connectivity

PARTNERSHIP

Dejero has announced a partnership with Intelsat to provide broadcasters with a new blended cellular and Ku-band IP solution for live television coverage from remote locations.

Dejero CellSat leverages Dejero's patented network blending technology to combine cellular connectivity from multiple mobile network carriers with Kuband IP connectivity provided by Intelsat. This gives CellSat users the required bandwidth and greater confidence to go live from virtually anywhere. If the bandwidth available from cellular connections dips due to network congestion or other factors, CellSat automatically blends in Ku-band IP satellite connectivity to boost bandwidth to the requested level for the live shot.

ZTE accelerates Pre5G evolution

NEW SOLUTION

ZTE Corporation has officially launched a total solution designed to accelerate the Pr-5G evolution for 5G-ready networks at the 2017 ZTE Wireless and Services User Congress held in Brussels, Belgium. This solution represents a comprehensive Pre5G upgrade following ZTE's proposal on its Pre5G innovation philosophy and development of a series of solutions.

With the 'Enjoying the present, cobuilding the future' philosophy, the total Pre5G solution allows existing 4G subscribers to experience 5G-like services. Meanwhile, it is able to co-exist with the 5G in the future for long-term collaborative development, quintessentially illustrating the clear view of ZTE based on its long-term ICT development research.

4G subscribers will still dominate the market for a long period (presumably a decade). That is, the Pre5G or post-4G network will still play a principal service-bearing role, while the 5G network will largely bear the services of high-end and hotspot areas and new services like uRLLC.

THE RESURGENCE OF SATELLITE BROADCASTING

Andrew Bond, Sales and Marketing Director, ETL Systems speaks exclusively to *SatellitePro ME* about the evolution of satellite broadcasting

NOVEMBER 2017 satelliteprome.com

EXPERT VIEW





Consumers demand content on every platform, everywhere, whenever they

want it. This constant flow of content has evolved and produced Over-The-Top (OTT) - the buzzword of the moment and an umbrella phrase for content delivered for on-demand streaming over the internet.

Many insist this will lead to the eventual demise of satellite for broadcasting. But in actuality, consumer demand for instant breaking news and access to live events and sports means that satellite is, in many instances, the only viable and reliable way of delivering this content. It is still, therefore, very much in demand, as those of us in the industry have long maintained given the number of applications dependant on it every day around the globe.

The Evolving Face of Broadcast

Nevertheless, broadcasters still struggle to compete with OTT channels, which enable almost any content producer to mass distribute on a reasonable budget. Much of the content available on OTT channels is free, further complicating broadcast operations with pressure to maintain low subscription costs and even in some cases, free content.

Broadcasters also face the all-but-impossible task of racing the public to be the first on a newsworthy scene or to supply exclusive access to live events. What with the proliferation of social media and the fact that any individual with a mobile device can capture and distribute footage, sometimes even before a broadcaster knows an event is happening, there is an increased impetus on the speed of deployment.

As a result, broadcasters must to be able to provide coverage to consumers rapidly, from wherever a scene may be, and most importantly in good quality. This is the key to maintaining relevancy, given that it is one of the few aspects which smartphones and footage captured by the unskilled public simply can't match.

Of course, this means broadcasters have to make the right investments and prevent the purchasing of below-par equipment as an attempt to keep expenditure low.

Maintaining a Reputation

The need for content everywhere, from anywhere is truly at the heart of the argument for maintaining satellite connections. Established broadband infrastructure is on the rise but can any region in the world boast quality, reliable fibre connections absolutely everywhere? My guess is no.

This is particularly applicable for live events or, for example, a well-known cycling race which only occurs once a year and is usually situated in remote countryside. Especially in the case of tragic natural disasters like the very recent Hurricanes battering the Caribbean Islands and United States, the only realistic way of ensuring a reliable feed to viewers is via satellite.

Reliable technology

Satellite operators know that for newsgathering, the ability to deliver live coverage quickly is paramount to a broadcaster's success. Let's consider the advantage of being able to setup a portable VSAT terminal in minutes, with auto-pointing antennas ensuring errors are unlikely and footage can be distributed instantly.



Consumer demand for instant breaking news and access to live events and sports means that satellite is, in many instances, the only viable and reliable way of delivering this content"

Andrew Bond, Sales and Marketing Director, ETL Systems

But consumers are also much less loyal to television channels or content offerings nowadays, due in part to the sheer range of options available to them. If they face any fluctuations in the quality of a broadcast, they are likely to switch elsewhere for their content.

The satellite industry is constantly innovating and producing new technologies to ensure continuous quality. In the past, VSATs were a byword for satellite interference and inevitably poor quality broadcasts. But solutions like a mobile app for assistance during setup, and vigorous type approvals to weed out the poor-quality amplifiers,

attenuators, block up converters and so on, are now beating the problem. Even the slightest error during manufacturing can severely effect broadcast operations when it comes to VSATs, but it is this type of innovation which will ensure satellite continues to remain a key player for broadcasting.

Within the realm of outside broadcast, where the locations and conditions of the live environment are often unique, VSAT equipment must be able to operate effectively and cope with many distinct challenges. Consider the difficulty of avoiding damage to any equipment within OB trucks in tricky driving conditions.

Within the military environment where equipment really is tested to its limits, it's absolutely essential that VSAT terminals remain reliable. But the very same VSAT equipment used in these environments are also used for broadcast, so we know they are well up to the task of covering live events and newsworthy occurrences wherever in the world.

Satellite's Future

The simple efficiency of satellite for broadcast will ensure it remains an integral way of distributing coverage from one place to another as well as Direct-to-home services. Arguably no other form of distribution affords such reliability in such hostile environments, meaning it is perfectly suited for an industry that demands coverage everywhere.

As this continues to grow and consumers come to expect news and live events as they happen, the demand for satellite will also do the same, as long as satellite providers ensure they invest in capable and quality equipment up to the task ahead.

BROADCASTPRO SATELLITEPRO

TOP 50 COMPANIES YOU NEED TO KNOW

PR050 has all you need to know about the top players in the region's broadcast and satellite market. A compilation of profiles of 50 broadcast and satellite companies in the GCC, the hardback coffee table book is a valuable resource for not only business entities but also customers looking for a ready reckoner of key industry players.



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Publishing Director Tel: +971 4 375 5471 raz.islam@cpitrademedia.com

Sandip Virk

Group Sales Director +971 50 929 1845 sandip.virk@cpitrademedia.com

Sheena Sapsford

Marketing Manager +971 4 375 5498 sheena.sapsford@cpitrademedia.com



AUGMENTED INTELLIGENCE

Augmented Intelligence (AI) is the current hot topic across a number of industries. Many companies are beginning to look at ways in which it can really help improve processes and reduce errors. Martin Coleman, Executive Director, IRG explains

It stands to reason that augmented intelligence should be the next tool we look at to solve the problem of interference, which is only going to get bigger. We are ahead of the game, but changes in technology will wipe out our efforts unless we adapt.

There are two very distinct methods: knowledgeable engineering, which is about teaching a machine some of the knowledge accumulated by people; and machine learning, where we teach a machine facts. Imagine the impact that either or both of those approaches could have on reducing errors and interference. I believe we should do both in parallel.

We have a big problem in our industry. You only have to look around the room at any satellite conference to see that there is a distinct lack of young talent. Older engineers with a wealth of accumulated experience about how to spot different types of interference or determine the source, for example, have to think about how they can bring their Level-1 or Level-2 engineers up to the level of their best engineer who has all the experience and knows how to deal with interference. Education

is important, but it takes nearly three years to go from a middle-tier engineer to someone who is at the top of the game, and that is expensive.

If we can feed some of that information into machines that can then use that knowledge to help us resolve interference, that will be a massive game changer. The alternative is knowledge simply being lost when someone retires.

Machine learning is about us telling the machine some of the facts and processes involved with interference resolution, so again some of those processes can be automated and sped up so much more than would be possible manually. Ultimately, you need to teach these machines. They are clever, but unless we input that information, they don't know what to be clever about.

Essentially, whichever method we are talking, augmented intelligence is like having a digital assistant to help solve the problem faster. What it never can be is a replacement for people, as you still need that human element. So alongside it, we should still be looking at education and what we do to attract new talent to the industry. Of course, this is still happening and

satellite operators already pour a great deal of resources into training people – that should definitely continue.

At the same time, we need a digital assistant for the satellite industry. While we need that to help solve interference, the beauty is that it can be taught a whole spectrum of things relating to the day-to-day tasks of satellite operations engineers.

Over the past few years, we have seen operators working together within the Satellite Interference Reduction Group (IRG) and the Space Data Association (SDA), for example. Now I would like to see those same operators, and more besides, working together to build the industry's first digital assistant to help solve some of those issues.

It will take some time, of course, but after maybe five years you will end up with a digital assistant, but instead of being specific to a certain operator, it will be a global digital assistant. Because it is a machine, it can work 24/7 and doesn't need rest like a human operator. All it needs is a capital cost of increased power. And a digital assistant could probably cope with various scenarios while doing its day job. PRO





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