4RF

# Replacing VSAT gives quality improvement and rapid ROI for Vodacom

Vodacom had been using satellite (VSAT) in the Democratic Republic of Congo to backhaul remote cellular traffic. As well as huge operational costs, traffic performance was compromised by the latency of the VSAT service affecting the BTS-BSC backhaul protocol and causing RACH/SDCHH assignment failures. Using the Aprisa XE point-to-point microwave link instead greatly improved both traffic quality and quantity, as well as providing Vodacom with a return on investment of just a few months.

APPLICATION AND DEPLOYMENT REQUIREMENTS

Using VSAT for cellular backhaul meant that Vodacom had two different issues to solve:

- Each VSAT link was costing nearly $2000 per month, which had a huge impact on operational expenditure
- The inherent round trip latency of VSAT caused a traffic backlog, which resulted in call failures of around 50%

Deployment of the Aprisa XE point-to-point microwave link began with one critical link to backhaul traffic from a base station in Gombe Matadi to Mbanza Ngungu, a distance of nearly 34 kilometres. Because Vodacom already had access to licensed spectrum in the 2000 – 2300 MHz band, the link was planned using this band:

THE 33.94 KM LINK BETWEEN GOMBE MATADI AND MBANZA-NGUNGU
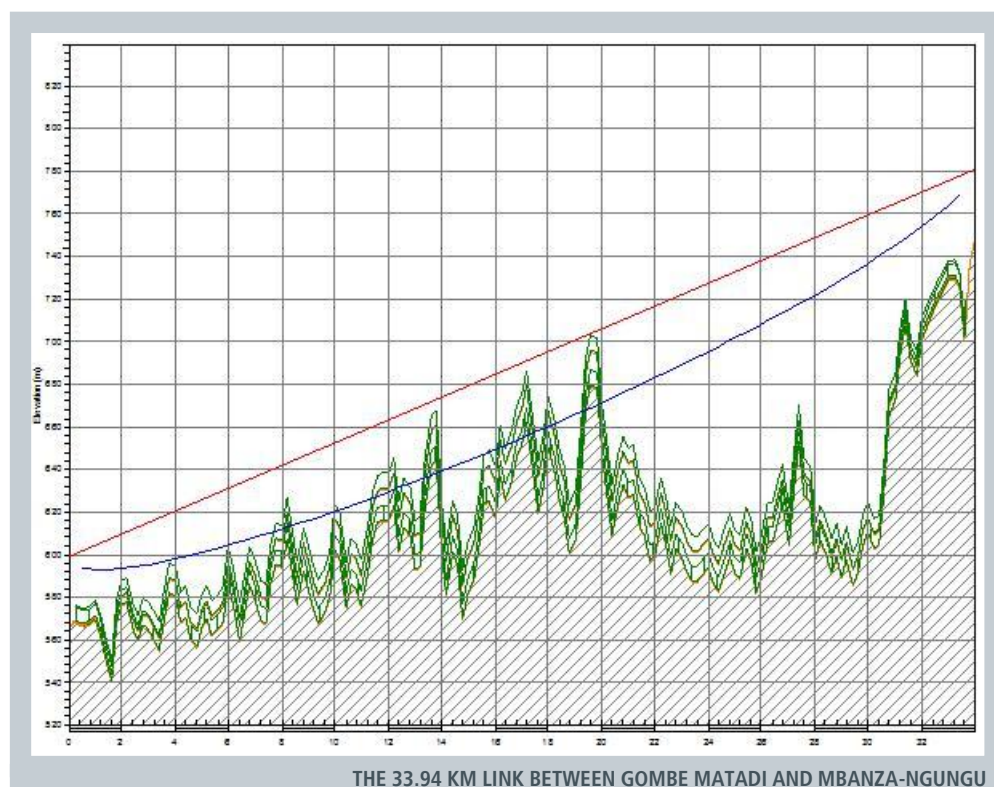
VODACOM
Democratic Republic of the Congo

> "
> We chose 4RF because the Aprisa XE could replace a VSAT link with a single radio link. This saved us considerable ongoing operational expenditure as well as improving the quality and quantity of our data transmission.
> "

Alain Mambueni Malanda
Head of Transmission Planning & Optimisation, Vodacom DRC

About Vodacom

Vodacom is an African mobile communications company providing voice, messaging, data and converged services to just over 47 million customers. From its roots in South Africa, it has grown its operations to include networks in Tanzania, the Democratic Republic of Congo ('DRC'), Mozambique and Lesotho. Vodacom is majority owned by Vodafone, one of the world's largest mobile communications companies by revenue. The company is listed on the JSE Limited and its head office is in Johannesburg, South Africa.

NETWORK DEPLOYMENT

The Aprisa XE was deployed using the 2000 – 2300 MHz band, configured with QPSK modulation in a 14 MHz channel. To support the backhauling E1 requirement, the QJET interface card was installed. Using lightweight parabolic grid antennas reduced the wind loading on the towers as well as making deployment fast and easy.

RESULTS

As configured, the link provided Vodacom with 11 E1 channels plus 1,024 Mbit/s of Ethernet traffic. The graph below records the parameters that contribute to the Stand-alone Dedicated Control Channel (used in cellular networks to provide a reliable connection for signalling and SMS messages) on a daily basis for a week before and three weeks after the base station traffic was switched over from the VSAT service to the Aprisa XE link. The congestion was hugely improved, with call failures dropping from 50% to a much more normal 5%.
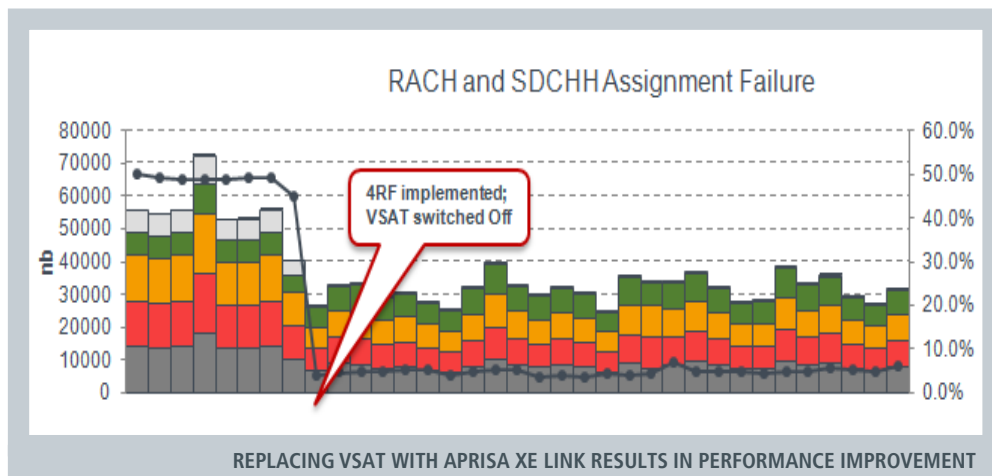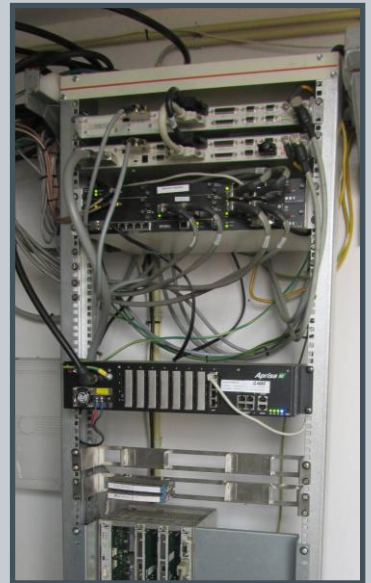

REPLACING VSAT WITH APRISA XE LINK RESULTS IN PERFORMANCE IMPROVEMENT

Additionally, Vodacom has eliminated the $1,977 monthly operational expenditure it was incurring for this single base station. The link has been operational for more than a year, without any drop in quality of service. After the success of this pilot deployment, to date a further seven Aprisa XE links have been deployed throughout Vodacom's network, and more links are currently being designed.

This deployment demonstrates clearly that while the Aprisa XE excels in making technically challenging links, such as long distances, over water or in harsh climates, it can also be used to help solve the business and operational challenges that alternate technologies bring.

Aprisa XE at Mbanza Ngungu

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