Aprisa XE

Remote rural deployment

ADVANCED POINT-TO-POINT WIRELESS SOLUTIONS

Cellular mobile coverage regardless of location: customers demand it, and operators want to provide it. In addition to deploying mobile base stations across large geographical areas, operators need a compelling business case for traffic backhaul to justify the widespread rollout of services. Add to this the need for high capacity, low latency, flexibility, security, and above all reliability, it is easy to understand why locating the right backhaul infrastructure can be a complicated process.

Enter the Aprisa XE point-to-point microwave radio family from 4RF. Operating in the sub-3 GHz licensed bands, the Aprisa XE products provide up to 65 Mbit/s throughput, over distances of up to 250 km, supporting both E1/T1 and Ethernet traffic. Whether bypassing existing microwave infrastructure to save capital expenditure in rural backhaul or replacing VSAT backhaul to overcome deployment issues and reduce operational expenditure, the Aprisa XE delivers a cost-effective, high performing backhaul solution.

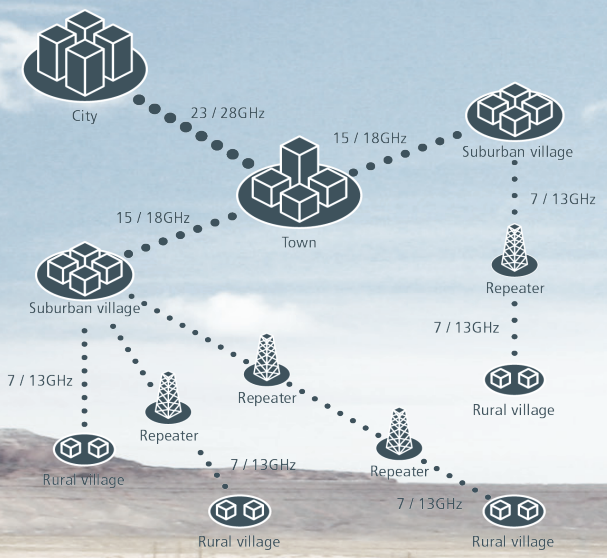
4RF helps mobile cellular operators and their customers realise the dream of ubiquitous mobility.

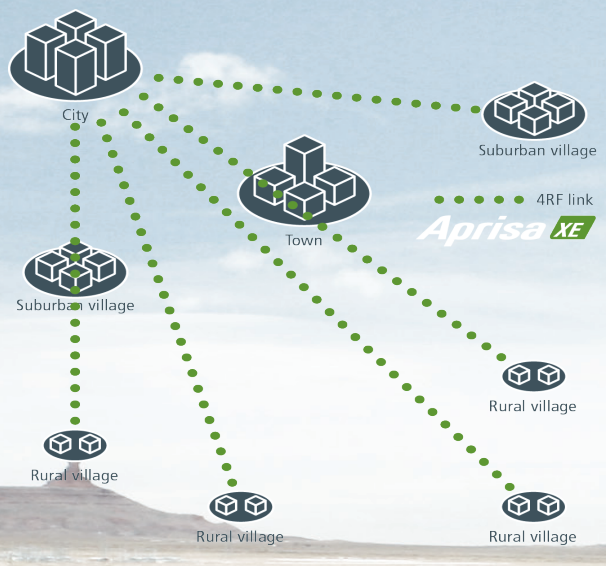
4RF

Infrastructure bypass

APRISA XE

Making a viable business case for operating mobile base stations in rural areas is difficult. The typical backhaul route involves a series of point-to-point microwave links from the rural location to a suburban tower, to a regional town, then finally to a city location where traffic reaches the core network.





The backhaul capacity required by each rural base station propagates back through the network, accelerating congestion in urban markets. This often results in the need to upgrade capacity right through the network. This is further complicated by the fact that larger channels in the traditional microwave bands between 7 and 38 GHz may be unavailable, and where they are, they are often prohibitively expensive.

The end result – despite the desire for wireless coverage in even the most rural areas, cellular operators cannot make an economically viable business case and are forced to make a choice: deny coverage or deploy loss-making infrastructure.

THE 4RF SOLUTION

Connect each rural base station directly to the core network using a single Aprisa XE long distance microwave point-to-point link.

Rural traffic can be backhauled with a single link without impacting the rest of the network. Using lower frequency licensed bands means that quality and reliability of service are not compromised. Bypassing existing microwave infrastructure brings many benefits:

- Capital expenditure and spectrum licensing costs are reduced by eliminating the need to invest in higher capacity equipment and additional bandwidth in the existing spectrum bands throughout the network.
- Where in-band mobile frequencies can be used for the Aprisa XE links, additional spectrum licensing costs are eliminated altogether.
- Additional revenue opportunities are generated by freeing up existing rural infrastructure, such as deploying WiFi hotspots or offering WiMAX-based broadband services in more rural areas.

Why choose Aprisa XE?

The Aprisa XE is the ideal backhaul infrastructure for cellular operators, bypassing capex-intensive microwave infrastructure in rural locations and replacing opex-draining VSAT links elsewhere in the network. Overall, the Aprisa XE presents operators with class-leading price-performance, a compelling backhaul business case throughout mobile networks.

VSAT replacement

APRISA XE

Satellite backhaul for suburban or rural mobile base stations enables a relatively simple network configuration, but presents many problems, including the operational expenditure incurred by monthly rental charges. These can undermine the economic viability of base stations, particularly in rural areas.

Satellite latency can impact network performance, particularly for time-sensitive voice calls. Deployment can be time-consuming and difficult, requiring large antennas, and with the need for a clear view of the sky, obtaining the relevant roof rights can be problematic. Weather conditions can also cause signals to fade significantly.

The end result – operators invest significant operational expenditure in the form of service charges, equipment rental and roof rights, for a network they do not themselves own, often making the business case for a cell site untenable.

THE 4RF SOLUTION

Use Aprisa XE terrestrial microwave long distance point-to-point links to backhaul traffic from mobile base stations to the core network.

Mobile base stations can be quickly and cost-effectively connected to the rest of the network. Replacing satellite backhaul with terrestrial point-to-point links brings many benefits to operators:

- Operational expenditure is greatly reduced, with the Aprisa XE's return on investment time often as little as six months.
- Control is retained over the network, eliminating reliance on third party service providers.
- Equipment installation is easier, less expensive, and less time-consuming than satellite, with small lightweight antennas maximising location options.
- Service quality, reliability and security are maximised, whilst minimising latency, essential for bandwidth-demanding time-sensitive applications.

Cost-effectiveness bypassing existing infrastructure significantly lowers capex and replacing VSATs eliminates ongoing opex.

Flexibility with T1/E1 and 10/100Base-T Ethernet options, the Aprisa XE is a flexible backhaul solution for voice and data applications today and tomorrow.

Capacity up to 65 Mbit/s throughput, with class-leading spectral efficiency.

Carrier-class performance with 99.999% availability, the Aprisa XE provides the quality of service mobile cellular operators need.

Availability with non-line-of-sight operation even over obstructed paths, traffic can be backhauled from base stations in topographically challenging locations.

Licensed frequencies with support for more than ten frequency bands between 300 MHz and 2.7 GHz, the Aprisa XE provides deployment flexibility, with the use of licensed frequency bands eliminating interference.

Range a single Aprisa XE link can cover up to 250 km, perfect for rural base stations, eliminating multiple hops and minimising capital expenditure.

Environmental robustness the use of lower frequency bands minimises the effects of rain fading, ducting, dust and sand storms that impact satellite and higher frequency microwave.

Minimal maintenance an all-indoor single box, front access to interfaces and connectors, and 4RF's SNMP-based management tool mean minimal maintenance, reducing network running costs. Split mount equipment is not required for lower frequency bands, eliminating the need to climb towers for maintenance.

Ease of install with its small form factor and lightweight grid or yagi antennas, the Aprisa XE maximises site selection options, eliminating many planning constraints and reducing the rigidity required for mounting.

Aprisa XE

ADVANCED POINT-TO-POINT WIRELESS SOLUTIONS

The Aprisa XE family of digital microwave radios is deployed by operators and companies throughout the world, for rural broadband access, inter-exchange linking, DSL extension, remote monitoring and control and base station linking. The Aprisa XE digital microwave radios enable always-on connectivity and the transmission of Internet, voice and data traffic between two fixed points over distances of up to 250 km.

The radios operate in the licensed sub-3 GHz frequency bands and transport a wide range of broadband-enabled services including Internet, VPN and LAN interconnect, VoIP, video conferencing, web-hosting and E-business applications; and voice services for telephone and fax.

SPECIFICATION	APRISA XE	
SUPPORTED FREQUENCY BANDS	300 MHz (330 – 400 MHz) 400 MHz (400 – 470 MHz) 600 MHz (620 – 715 MHz) 700 MHz (698 – 806 MHz) 800 MHz (805 – 890 MHz)	900 MHz (850 – 960 MHz) 1400 MHz (1350 – 1550 MHz) 1800 MHz (1700 – 2100 MHz) 2000 MHz (1900 – 2300 MHz) 2500 MHz (2300 – 2700 MHz)
MODULATION	16 / 32 / 64 / 128 QAM and QPSK, software configurable	
CAPACITY	up to 65 Mbit/s	
CHANNEL SIZES	25 kHz to 3.5 MHz in 300, 400 MHz bands 1.75 MHz to 3.5 MHz in 600 MHz band 500 kHz to 1 MHz in 700 MHz band 75 kHz to 3.5 MHz in 800 MHz band	25 kHz to 1.75 MHz in 900 MHz band 75 kHz to 7 MHz in 1400 band 500 kHz to 14 MHz in 1800 band 250 kHz to 14 MHz in 2000, 2500 MHz bands
INTERFACES	E1 / T1 G.703 / 4 2-Wire FXO / FXS 4-Wire E&M	V.24 async, sync and over sampling mode High-speed sync X.21 / V.35 / RS-449 / RS-530 Integrated 4-port 10/100Base-T switch

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ABOUT 4RF

Operating in more than 130 countries, 4RF provides radio communications equipment for critical infrastructure applications. Customers include utilities, oil and gas companies, transport companies, telecommunications operators, international aid organisations, public safety, military and security organisations. 4RF point-to-point and point-to-multipoint products are optimized for performance in harsh climates and difficult terrain, supporting IP, legacy analogue, serial data and PDH applications.