

African operator upgrades
to HSPA with CBNL

- African operator requires fast and scalable 2G to 3G hybrid backhaul upgrade to expand coverage and capacity for a major sporting event
- CBNL deploy VectaStar from a central hub at 10.5GHz and 26GHz
- Success leads to further significant network-wide deployments.

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Major sporting event calls for 2G to 3G hybrid backhaul upgrade



The challenge

With a high-profile sporting event on the horizon, a major African operator had to expand its mobile data coverage and capacity. Not only to prepare for increased traffic, but to stay competitive by extending coverage and rolling out a high-speed data service.

The operator's long-term strategy was to migrate its network to an all-IP core and in preparation, needed a backhaul network that was efficiently and quickly deployed, whilst maintaining the flexibility to scale for the future.

Its existing 2G backhaul links were provided by the incumbent wireline operator. However, in evaluating its business case, the operator could see that continuing with leased lines would not only limit the speed at which it could roll out its network, but leased lines' capacity limitation would also affect its ability to scale going forward. It required a transport efficient backhaul solution that was fast and scalable, supporting the upgrade from 2G to 3G, whilst managing costs and dealing with the bursty nature of 3G traffic.

The solution

Having previously achieved backhaul success with CBNL's VectaStar point-to-multipoint (PMP) microwave solution in other markets, the operator found this solution was fast to deploy and capable of backhauling mixed traffic.

Unlike leased lines, PMP links a number of cell-sites to a single aggregation point and operates multiple frequencies from the same hub station. This immediately reduces the number of radios and antennae, making the network less expensive to build.

To build the backhaul network quickly, and with the flexibility to scale for the future, a combination of the VectaStar 10.5GHz for coverage and 26GHz for capacity in urban centres was deployed. VectaStar solutions can operate multiple frequencies from the same hub station so that sites can be commissioned initially for coverage and then have 26GHz overlay capability commissioned later if required for capacity.

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next generation
thinking

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The results

Today the operator is using VectaStar to enable new 3G cell-sites. The operator recognised the ability of the core VectaStar architecture to optimise capacity through statistical multiplexing. Furthermore, with VectaStar abis optimisation enabled, the operator is now seeing, on average, a 4 to 1 sector aggregation gain. Abis optimisation removes unused TDM traffic timeslots and the remaining timeslots are constantly analysed for activity. Only timeslots carrying new information are carried across the service.

Three of the E1s were used for GSM backhaul (abis interface) and one E1 was used for 3G backhaul (lub interface). In the example below, you can see that the optimisation reduces the bandwidth carried from 8Mbps (four E1s) down to 1.5Mbps (less than one E1).

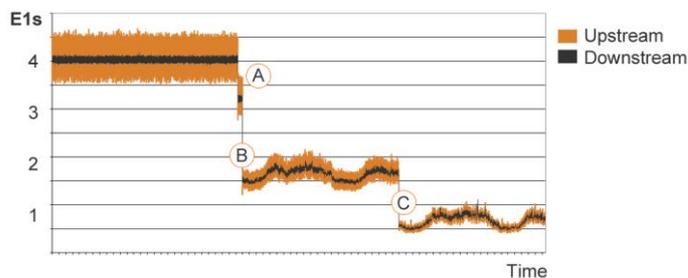


Figure 3 - Sequential implementation of optimisation on four E1 services

- A. Optimisation switched on for the first E1
- B. Optimisation switched on for the second and third E1s
- C. Optimisation switched on for the fourth lub E1

A good example of this in practice is one town where 41 cell sites are covered with a single VectaStar base station backhauling the equivalent of 88 E1s (more than 176Mbps of potential capacity). The legacy point-to-point microwave link that backhauls the base station is peaking at 40-50Mbps which demonstrates the aggregation efficiency of the VectaStar solution. This ability to instantly establish links further compliments the operator's move towards HSPA+ and its continuous migration to an all-IP core, rapidly increasing in the speed of rollout.

By electing to use the VectaStar PMP microwave backhaul solution, this major operator was not only able to install a platform that supported their migration from TDM to an all IP network using a hybrid network intermediate step, but was also able to implement valuable traffic optimisation technology reducing the payload to be carried.

The solution was also able to cope with a global sporting event without extraordinary upgrades. The PMP architecture enables the operator to rapidly expand the number of cell sites whilst coping effectively with fast data traffic growth by aggregating site traffic over the air at the network edge.