

Cost Effective Local Loop Telephony Services using VoIP

Background

The client has a license to provide local telephony services in Enugu province in Nigeria. The license is for the use of 3.5GHz wireless equipment. WTL supplied all the VoIP switching, carrier interconnect, Pre-Paid business platform and tools to run this network.

Money had been invested to obtain the operator license so the client needed to implement a solution quickly and to start generating revenue as soon as possible. An attractive set of telephony services had to be available for potential subscribers from day one.

As this was to be a completely new venture it was very difficult to estimate the capacity required. A highly scalable solution was therefore essential.

WTL Solution

The network design selected used IP across a radio link to subscriber premises. This IP service could then be used to deliver both telephony (using IPNx AG VoIP gateways) and internet access. Directional antennae were used which allowed radio coverage to be built up as required. Each base station supports up to 12 transmitters each covering a 30° spread. This meant blanket radio coverage did not have to be installed, keeping start up costs down.

All traffic is delivered over the radio network to a central router and IPNx switch. The router splits internet data traffic off for connection via a satellite link to an internet backbone connection in the UK. VoIP traffic is passed to the IPNx. Routing then takes place depending on the call's destination. The powerful routing built-in to the IPNx separates national and international traffic.

International calls remain as VoIP and are routed via the satellite to a carrier partner in the UK. These international calls are converted by the IPNx into NOP (WTL's patented Network Optimisation Protocol). This gives up to 16 to 1 traffic compression and excellent efficiency on the satellite link. This is essential to the effective operation of the business as the satellite bandwidth is expensive and is shared between VoIP and internet traffic.

In the UK the carrier partner has been equipped to receive WTL's optimised NOP traffic before terminating the calls in the most economical way.

Local and national calls are converted from VoIP to regular TDM and routed via E1 ports with SS7 straight into Nitel, the Nigerian PTT (later also to Nigerian GSM operators).

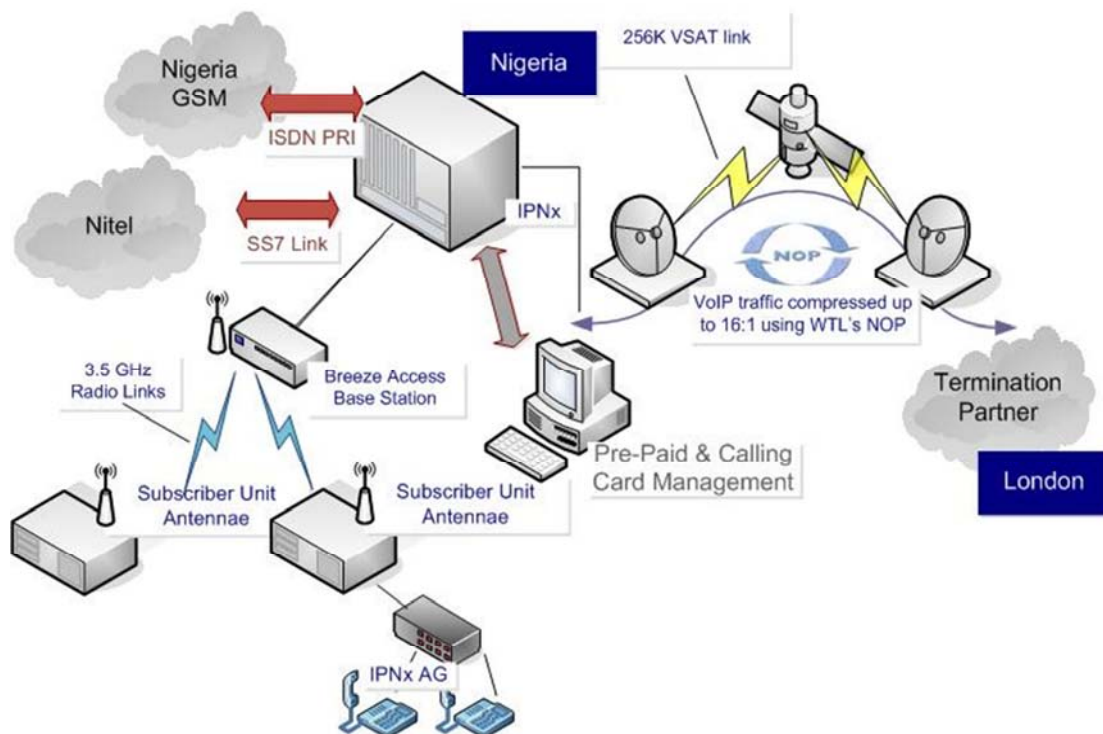
Revenue Generation

A challenge of this project was the conflicting requirements of establishing a new wireless infrastructure whilst trying to generate revenue as soon as possible. In an ideal world it would be possible to establish extensive radio coverage with a large number of base stations and then launch a marketing campaign to attract subscribers anywhere in the region. However, this takes a large amount of up-front investment. Instead a number of services were launched, taking advantage of the flexibility of the solution installed:

- **IP Call shops** – taking advantage of the low international rates now available via VoIP over satellite the customer was able to offer WTL-supplied IP Call Shops. The initial Call Shop were selected within the coverage of the first radio antennae.

- **International Wholesale** – any spare capacity on the international satellite link could be offered to other Nigerian competitive operators. These operators deliver their calls to the customer's switch in a telehouse, either via ISDN or as VoIP. Once in the IPNx calls were transformed into NOP format for transmission across the satellite link.
- **Calling Cards** – The customer was already active in the Nigerian calling card market. It was natural to extend this operation using the Calling Card support of the IPNx and the high quality satellite link to Europe to offer attractive call rates.
- **Termination in Nigeria** – Calls to Nigeria are normally expensive and often low quality. Because of the official, licensed status and high reliability SS7 connection to Nitel, the customer was able to take advantage of this and offer European carriers termination.

Wireless Local Loop Project



Future

The solution described is a pilot and as part of the license provisions must be rolled out to all parts of Enugu state. Other services are envisaged, for example, work is underway to offer voice mailboxes to subscribers.

The customer also holds a license for the 1.8 GHz frequency. This gives less bandwidth per connection and is not suitable for the high capacity IP services described above. However, the cost of

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equipment per subscriber is lower meaning that lower value subscribers can be served. Their traffic will be brought into the same central site switching infrastructure where they can be offered the same range of voice services as the premium subscribers (but not internet access).

Benefits of WTL Solution

- Speed of implementation
- Wide range of service possibilities
- routing splits international calls from national
- Use of NOP to reduce cost of carrying international traffic via satellite
- Multi-protocol IPNx allows E1 TDM connections, SS7, standard VoIP and optimised NOP on same switch
- Single box solution for VoIP, SS7, carrier interconnect, routing, pre-paid customer, billing & provisioning
- Ability to add new services at any time (call back, business or domestic telephony, calling cards)
- Low starting cost but high scalability
- Full support for VoIP Call Shops
- WTL partner carriers for call termination