How Will NBN Voice Services Work?

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Subscribers have long assumed ubiquitous availability of reliable fixed line voice services. The NBN will replace the fixed line voice network, and hence must provide an alternative to it.

The NBN provides a "layer 2" service. This means that the NBN presents an Ethernet port (connection) to subscribers, another one to Service Providers (known as Access Seekers), then transfers Ethernet frames (packets) between these ports according to a previously agreed Quality of Service.

In other words, the NBN provides a pipe. Service Providers use it to offer products: Broadband Access, Pay TV etc.

However many subscribers will demand on-going access to a fixed line voice service, or a similar alternative. Supporting voice services is a key NBN objective, this report shows how it is done.

Background

From a subscriber perspective, fixed line voice services generally appear as one or more "RJ11" wall sockets. Handsets (cordless or fixed) plug into these sockets via the standard RJ11 plug, a fixed line voice service results.

In particular, the telephone socket provides electric power to operate the handset, transfers dial tones, ring signals, numbers for call setup and analog voice signals.

The NBN must replicate this socket, so that existing handsets can be plugged in and work as before.

Although the socket may be replicated, the remainder of the fixed line voice infrastructure will not be, as the NBN has replaced it. As outlined above, the NBN is a layer 2 service provider. Voice services provided over the NBN network will be based on Voice over IP (VOIP), similar to current subscriber voice services offered by companies such as Engin.

However voice services running on the NBN will be sold by third party Retail Service Providers, not by the NBN. This is in keeping with the NBN "wholesale" layer 2 service provider mandate.

Nonetheless the NBN must provide as standard the infrastructure needed to support VOIP services, as well as voice call data capacity.

This works as follows.

NBNCo Voice Call Infrastructure

The standard NBNCo customer device, known as a residential Network Terminal Unit (NTU-R) has 4 Ethernet data ports and two analog voice ports. The NTU replaces the existing broadband gateway. The two voice ports replace the previous twisted pair voice service connection, and are called Analog Telephony Adaptors (ATAs).

Subscribers connect their fixed line phone to one of the analog voice ports. If they have purchased a voice service from a Retail Service Provider, then the fixed line telephones will (appear) to work as before.

Each Analog Telephony Adaptor port provides the following:

- electric power for handsets, conversion of analog voice signals to digital (and vice versa), DTMF tone conversion, dial tone, ring/busy signal, calling number display
- a Session Initiation Protocol (SIP) Profile implementation. SIP is the standard signalling protocol for VOIP services.

In addition to the analog voice ports, the subscriber NTU also has 4 data ports, similar to current broadband gateways. A voice service can also operate through a data port, using similar VOIP mechanisms to the ones on the analog voice ports. However, in this case the Analog Telephony Adaptor is a separate piece of equipment, which connects to the NTU data port. Engin currently offer VOIP services in a similar way, with an external "voicebox" connecting to a data port on the subscriber broadband gateway.

Reserving Voice Call Capacity within the NBN

The two voice ports on the subscriber NTU allow the connection of fixed line phones, and the SIP Profile needed to setup and receive calls. For these calls to work, sufficient NBN data capacity must be reserved for them.

Subscribers access the NBN via an "Access Virtual Circuit" or AVC (see http://tektel.com.au/how-fast-is-the-NBN/ for more detail on NBN AVCs). The default NBN subscriber interface comprises two Access VCs, one for data, one for voice services. The voice AVC has a bi-directional 150 kbps reserved to support voice calls.

Additional Requirements for Voice Service Support

The NBN provides voice ports and capacity for voice traffic. The Retail Voice Service Provider (or Access Seeker) is responsible for the remaining voice service components. These include:

- subscriber number management (e.g. transferring telephone numbers from previous services)
- call termination
- billing
- service assurance

Current retail VOIP service providers provide similar functions to the ones above.

Summary

The NBN replaces the fixed line voice network, and hence must allow the existing fixed line voice services to be replicated. The NBN does this by providing analog voice ports in the subscriber Network Terminal Unit (NTU) and reserving network capacity for voice calls. Retail voice service providers will be responsible for all other voice service components.