

ARE YOU KEEPING UP WITH THE NATIONAL BROADBAND NETWORK TECHNOLOGY, YOU MUST

What we refer to as the National Broadband Network is in fact made up of various companies and technologies. Today you can buy a dwelling that is connected to the National Broadband Network through network companies like nbn, OptiComm and a number of others. So the National Broadband Network is a hybrid set of network providers using a range of access technologies which provide higher speeds than those most of us currently experience, at least those of us not already connected to fibre. Regardless of how the National Broadband Network gets to the customer our challenge is making sure the customer can connect to the services provided. So let's recap what the technologies are, how they are delivered, what legacy services they can support and where can a cable connect to and what about the growing number of granny flats.

The technologies being used by the various network companies to deliver the National Broadband Network are:

Fibre to the Home FTTH or also known as Fibre to the Premises FTTP. This is where fibre is run into the home and terminated on an Optical Network Termination device (ONT) which is called NTD for Network Termination Device.

Fibre to the Node FTTN is where fibre is run to typically within 500 meters from the home and then the existing copper cable is used to extend the service from the node to the home. The service is terminated on a Vectored VDSL Modem which is very similar to the current ADSL modems.

Fibre to the Building is where fibre is run into an apartment building and

terminated in a building node. Just like FTTN the only difference is, instead of the node being in a large green weather proof cabinet out on the street it is inside the building. The service is terminated on a Vectored VDSL Modem which is very similar to the current ADSL modems.

Hybrid Fibre Coax (HFC) or as is more commonly known, Pay TV cable. A coax cable is run in from the street and terminated onto an F connector typically mounted on a wall plate. The service is terminated on what is typically referred to as a cable modem.

Fixed wireless, this is where the service is delivered using the same technology used for mobile phones, except the service is terminated on a fixed wireless device and is called an NTD.

Satellite is where the service is delivered via a satellite link and terminated on a satellite termination device and is called NTD.

Table 1 shows the access technology and the ports that are found of the NTD or modem that terminated the network provider's network.

The question is, where can I, a cabler connect to, or work from?

Whilst this can seem messy, it is not if we use first principles to the definition of the network boundary as outlined in AS/CA S009 appendix J. In summary this is:

The network boundary is:

1. as agreed between the customer and the carrier, if there is no agreement then:
2. the MDF, if there is no MDF, then
3. the Network Termination Device (NTD), if there is no NTD, then
4. the first telephone socket

So in the case of a service provided over FTTN it is the NTD.

On the other hand for a service provided over FTTN/B it could be any of the following:

1. Copper NTD
2. MDF
3. First telephone socket

If we apply the same logic to each and every access technology you can easily work out where the network boundary is. If in doubt, consult appendix J of Australian Standards AS/CAS009.

Now, that was easy, once you identify the access technology you know where you can connect to and work from. But maybe not, yes, there is always a "but". Whilst you can identify the network boundary and yes you can make changes from there you must be conscious of the fact that the services being delivered are in fact delivered by a Retail Service Provider (RSP). In the majority of cases the RSP will install another device that connect to the NTD or modem and this is commonly known as a "Residential Gateway" and in the case of FTTN/B and HFC the residential gateway could be incorporated into the modem.

A residential gateway is a device which provides a number of functions, these being:

1. Router
2. Switch
3. Analogue Terminal Adaptor
4. Ethernet switch
5. Wireless access point

Figure 1 shows a residential gateway with connections to the network provider's access technology, traditional analogue phones, wireless devices and Ethernet devices including Smart TVs and VoIP phones.

Connection to wireless devices is reasonably straight forward as long as you are within the range of the wireless signal. Sometimes this is a challenge so you can use WiFi extenders or simply install another wireless access point.

Connection to the analogue and Ethernet devices are best done using Category 5 cable or better. Just install the category 5 cable as you do for data and it will support analogue voice and Ethernet. In some cases when cabling is a problem and the wireless is beyond reach you can consider installing Power Line Telecommunications devices which use the 240V AC power cable as the physical carrier.

If you want the connectivity to be the most reliable possible, then always start with Category 5 or 6 cable as this is the most reliable and cost effective connectivity technology.

One of the challenges is knowing if the current services you have can be easily migrated to the National Broadband Network. In short, you need to check as we do not know as it is a combination of the Network providers Network and the Retail Service Providers Network. So in the case of premises where they have:

1. Back to base alarm
2. Personal alarms such as medical alerts
3. EFTPOS

You need to check with the existing provider of the service in question to confirm that their service will in fact operate over the service being provided by the Retail Service Provider chosen. Do not make it complicated for yourself, simply inform your customer to ask their Retail Service Provider that is their Telephone and/or Internet Service provider:

"Can my existing back to base alarm, personal alarm etc. work on your service offering?"

Ideally your telephone and/or internet service provider should respond to this question in writing. Once they have an answer then you need to connect them the same way you did on the existing copper telephone service.

What about connections to a granny flat or more correctly a second dwelling at the same address? There are two ways to look at a separate dwelling at the same address:

1. Share the same access technology
2. Have a separate service installed

If you share the existing access technology you will need to install some connectivity technology between the main dwelling and the second dwelling, this technology could be WiFi or Wired. WiFi is probably not adequate as the signal will probably be too weak, so you may need to look at a wired solution. A wired solution has some challenges as there are a few:

- a. PLT
- b. Twisted copper cable say Cat 5
- c. Fibre

PLT may work as long as the main dwelling and the separate dwelling are on the same circuits but you need to consider the susceptibility to lightning.

Twisted copper pair is relatively easy but again you must consider surge suppression. In fact "AS/CA S009 clause 10.2 installation of surge suppression where required" note 2 states "Where a cable is provided between two buildings, the surge suppression should be installed at the point where the cable enters each building, i.e. at both ends of the cable between the buildings"

Fibre between the buildings is the best

solution as lightning is not an issue. Once the fibre is there, you will need to install a media converter that converts the RJ45 Ethernet port to fibre. Naturally you will need two, one at each end. Alternatively you can buy Ethernet switches with 1 fibre port so you can use this to extend the service. Note, if you use fibre to the second dwelling then any existing analogue services such as telephone, personal alarm will not work as all telephony will need to be VoIP unless you install another gateway device with the analogue terminal adaptor, phone port.

If you want a separate service installed you will need to request this from your telephone or internet service provider.

This is a new and exciting world for all of us but we need to make sure we keep up with all the changes that are happening with the move to a National Broadband Network. If you have any questions please send them to enquiries@acrs.com.au or go to www.registeredcables.com.au/industry/marketing-and-support-material/ and log in using your cabler registration number and your surname as there is quite a lot of technical information.

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Figure 1: Residential gateway connectivity

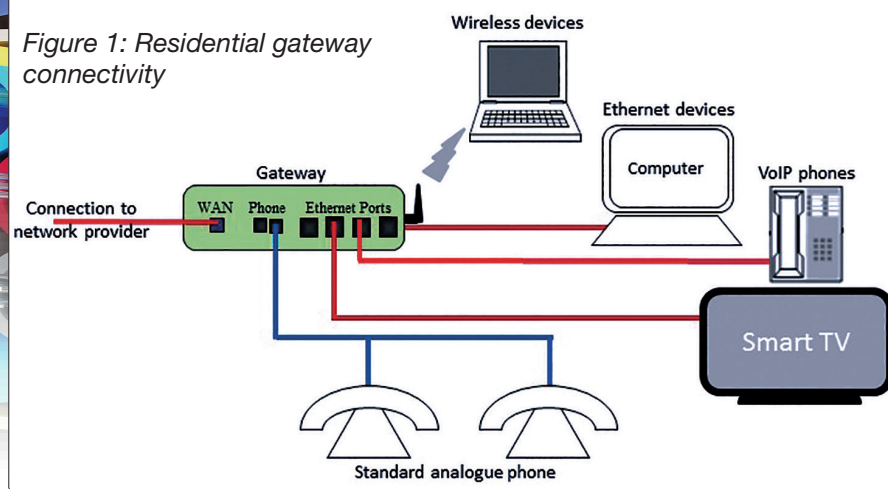


Table 1: Voice, Data and RF ports

Access Technology Network	Termination Device	Voice ports (legacy)	Data ports (Ethernet)	RF port
FTTH	NTD	Yes	Yes	Yes ¹
FTTN	Modem	Yes	Yes	No
FTTB	Modem	Yes	Yes	No
HFC	Modem	Yes	Yes	No
Fixed Wireless	NTD	No	Yes	No
Satellite	NTD	No	Yes	No

Note 1: This applies in some new developments