

Terrestrial Broadcasting and TV Content Delivery on the NBN



BROADCASTAUSTRALIA

**Broadcast Australia
White Paper**

Summary

Broadcast Australia believes Australia will benefit from enhanced broadband services and that the NBN investment will lead to growth and innovation for the media sector which is good for consumers and the industry alike. Broadcast Australia shares the Federal Government's vision for the contribution that broadband will have on the overall Australian economy and believes it can continue to play a leading role in that vision through terrestrial transmission and its wholly owned subsidiary Hostworks.

Broadband services delivered over the fixed network will complement terrestrial broadcast services and not replace them. Terrestrial broadcast distribution will remain a highly cost effective mechanism (with a total of over 100 Mbps of high quality video capacity already available today) for distributing Free to Air (FTA) content to market sectors and geographies within those areas covered by the NBN fibre and those that will remain beyond the reach and capabilities of the NBN's FTTH footprint. Indeed, terrestrial distribution requires no incremental or ongoing additional costs for 99% of Australian homes whilst the NBN fibre network is planned to reach only 90%. Additionally, as detailed in Goldman Sachs NBN report¹, there is unlikely to be significant growth in consumer expenditure on content services over coming years despite the development of greater network capability. This highlights the strong and ongoing need for FTA terrestrial broadcasting.

Consequently, Broadcast Australia believes there is no compelling business case for replicating carriage of FTA, or even Pay TV services on the NBN as existing distribution facilities (terrestrial, cable and satellite) already provide acceptable and ubiquitous delivery platforms that will simply be duplicated if, in particular, an RF (radio frequency) overlay capability was implemented on the NBN. There does not appear to be any desire or justification from either the broadcasters or consumers to pay new costs for an NBN delivered service, particularly those that are delivered to consumers free to view.

The objective of this short paper is to present Broadcast Australia's views of the merits of the technology choices available for delivering media services, both existing technologies and those that may be enabled through the NBN. These are vital factors that NBN Co. and other key industry stakeholders will have to consider when assessing what media content opportunities might exist for delivery over the NBN in a way that creates new innovative services that complement existing services.

¹ Navigating the Path to Australia's NBN, Goldman Sachs August 2009

Background

For many decades, terrestrial broadcast technologies have been the primary mechanism for distributing linear media content to audiences. These technologies have stood the test of time and have evolved very effectively using analogue transmission. They have progressively incorporated new features such as stereo radio, colour TV, Teletext, stereo TV sound and EPGs. The recent deployment of digital TV and radio transmission opens up even greater opportunity for future enhancements. In Australia, the current digital TV services already deliver a cumulative bitstream in excess of 100 Mbps into the vast majority of homes in the country.

The advent of the "mass market" internet over the past 15 years has also demonstrated capability for delivering complementary media services such as internet radio, short video clips (e.g. YouTube) and most recently catch-up TV (e.g. BBC iPlayer and ABC iView). Whilst introducing new dynamics to the media industry, these new services have generally been viewed as complementary to, rather than substitutes for, linear broadcast services. This is demonstrated by the recent introduction of hybrid terrestrial broadcast / IPTV boxes such as TiVo, HbbTV (in France and Germany), project Canvas in the UK and many other similar initiatives.

Implementation of the NBN and the quantum leap in fixed network bandwidth it will deliver, will provide new and greater opportunity to deliver further value added services to consumers over time, potentially including new media services. For the reasons outlined in this paper, Broadcast Australia strongly believes these new services will be complementary to existing terrestrially delivered services rather than replacements.

As a result it would appear that the business case for an RF overlay component to the NBN is difficult to justify.

Approach

In developing this paper, Broadcast Australia has:

- drawn upon its own extensive experience and knowledge in developing and implementing media content delivery networks and systems in both terrestrial transmission and the internet;
- held discussions with other key stakeholders in the industry including: FTA broadcasters, Pay TV operators, likely NBN technology vendors and other key industry opinion leaders; and
- conducted cost analysis of some of the content delivery options.

Technology Choices

There are broadly six approaches for the delivery of high quality audio visual (i.e. video or TV content). These are summarised below. The lighter areas relate to existing / traditional means of distribution and the darker areas relate to new / emerging means of distribution.

Technology	Description	Strengths	Weaknesses
Terrestrial FTA Broadcast	Traditional means of distribution of FTA radio and TV via RF terrestrially	<ul style="list-style-type: none"> Well proven with established networks Ubiquitous – already reaching the vast majority of Australian homes Very efficient Significant sunk investment with minimal need for re-investment In home reception and display equipment already in place and paid for (this will be especially so by 2013 when analogue turns off) High bandwidth multi-channel and high definition capable Portability (e.g. with rabbit ears can be watched in shearing shed) 	<ul style="list-style-type: none"> One-way multicast architecture Not appropriate for delivery of “long tail” content (i.e. consumer specific content on demand or niche content)
Satellite FTA Broadcast	Used to distribute FTA TV to very remote areas not served by terrestrial networks ²	<ul style="list-style-type: none"> As above Serves remote areas unlikely to be reached with 100Mbps services by other current or future technologies under the NBN rollout National coverage, already supported by Federal Government’s commitment to new satellite digital platform at \$40m p.a. (see footnote) 	<ul style="list-style-type: none"> As above
Cable	Subscription TV delivered via cable (HFC) networks	<ul style="list-style-type: none"> Well proven with established networks Very efficient Significant sunk investment with minimal need for re-investment (at least for TV distribution purposes) In home reception and display equipment already in place and paid for 	<ul style="list-style-type: none"> Limited cable footprint Needs in-house cabling
Internet / IP Unicast	IP unicast uses the core “bit pipe” functionality of the internet / NBN to provide higher speeds to deliver content to consumers PCs, TVs and other devices. It is primarily designed for one-to-one (i.e. unicast) conveyance of content.	<ul style="list-style-type: none"> Ideal for delivery of on-demand content e.g. ABC iView and therefore delivery of the “long tail” Enhanced opportunity with additional NBN bandwidth 	<ul style="list-style-type: none"> Not appropriate for delivery of high demand content to multiple users at the same time due to network capacity limitations For example broadcast type content especially popular / live content

² On 5 January 2010 the Minister for Broadband, Communications and the Digital Economy announced decision to assign \$40m for provision of TV services to viewers in regional blackspots. Satellite will be used to serve many of these areas

Technology	Description	Strengths	Weaknesses
IP Multicast	Utilises the core IP NBN capabilities to deliver one to many multicast services (e.g. IPTV)	<ul style="list-style-type: none"> Overcomes some of the unicast capacity issues for delivering high demand “popular” content 	<ul style="list-style-type: none"> IP Multicast operates at layer 3. Given that the NBN will be a wholesale operator and has stated it will provide only layer 1 and 2 services, there are some open questions as to how this technology will in reality be deployed Proven deployment experience on large wholesale public networks is limited Therefore cost and capacity impacts of deploying this technology are not yet well understood For viewing on existing TV equipment consumers would need to obtain new set-top boxes or other devices requiring further costs for consumers in addition to the current terrestrial digital transition expenses
RF Overlay	Already deployed in Australia on some existing small scale estate based fibre deployments. Also by Verizon in the US. ³ This would use a completely separate light wavelength on the NBN’s layer 1 fibre network. The new wavelength would be “modulated” with the RF carriers for existing FTA terrestrial broadcasters, and possibly subscription TV services (i.e. Foxtel or Austar). Services would appear at the consumers premises as a regular coax connection on the NBN Optical termination unit (ONT) for connection, in most instances, to existing TV devices	<ul style="list-style-type: none"> Delivers existing FTA terrestrial services (and potentially Pay TV services) to the consumer in exactly the same electrical format as currently available. Compatible with existing TVs, set-top boxes, PVRs, etc. No impact on the NBN IP capacity May be usable in selected terrestrial “blackspot” areas Also useful in areas where planning restrictions / covenants prohibit installation of rooftop antennas, e.g. gated communities – estimated to currently number up to 100,000 homes Provides the ability to target small population centres as the equipment is scaled to serve 1,000 to 2,000 fibred premises 	<ul style="list-style-type: none"> Incremental cost of implementation nationally across the NBN will be significant. Broadcast Australia estimates somewhere between \$900m to \$1.1 bn⁴, plus additional costs to the consumer for re-cabling from the ONT to TV antenna outlets Costs will increase further the greater the capacity (i.e. number of services) needed (e.g. if transport of both FTA terrestrial and pay-TV services were required) Not suitable for non FTTH areas Additional cost to consumers for re-wiring antenna feeder to the NBN termination box for little benefit if existing antenna is fully serviceable Many homes use set-top antennas (e.g. “rabbits ears”) for reception. They are likely to be reluctant to incur in-house wiring to connect their TVs to the NBN termination unit Services will not be available outside the NBN FTTH footprint nor to caravan and boat dwellers, nor to handheld / portable devices Optical link budget needs careful planning and may suffer from interference restrictions, especially if deployed in order to carry FTA and Pay TV signals

Traditional vs. NBN Costs of Delivery

Broadcast Australia conducted an analysis of the ongoing cost of providing existing terrestrial broadcast services compared with the likely cost of replicating these on the NBN using an RF overlay to provide services that would be compatible with existing TVs and STBs and therefore would not need further consumer equipment investment.

³ As at February 2009, Verizon claims to have connected 1.9 million homes in the US using its FiOS network

⁴ Source: This figure comes from a variety of industry sources. One such source is: http://www.circleid.com/posts/20091214_ip_tv_vs_ip_tv_plus_rf/

The cost of deploying an RF overlay on the NBN is estimated to be between \$125 and \$150 per household⁵. This includes the incremental costs of ONTs that support an RF overlay plus network costs of obtaining RF feeds off-air, modulating these RF signals onto an optical source, together with associated optical amplifiers and combiners. Based on an assumed 7.2m households covered by the NBN FTTH network footprint this represents an incremental investment of between \$900m and \$1.1bn. It is expected this network investment is likely to need periodic upgrading / replacing possibly on a frequency of 7 to 10 years on average.

Consequently it does not appear that a competitive return would be achieved from this new investment when it directly replicates existing terrestrial and satellite networks which have significant sunk investment of many hundreds of millions of dollars. Therefore there does not appear to be a financial justification for deploying linear video services via an RF overlay on the NBN, requiring the FTA and Pay TV broadcasters to incur significant additional simulcast costs during a transition period with no benefit to themselves or end consumers.

Most households have already invested in terrestrial antenna installations which rarely need attention and by 2013 most homes will have converted to digital terrestrial reception prior to analogue switch off (note that more than 54% of homes are already DTV ready)⁶. As a result there appears little consumer justification for switching to the NBN to receive the same or similar broadcast services if they were to be made available.

Consumer Proposition

The uptake of internet delivered media has demonstrated a strong desire by consumers to complement existing TV viewing. It has marked the start of a period of significant fragmentation of media consumption with some market sectors selectively supplementing traditional broadcast usage with modest amounts of online, whilst other sectors have more significantly replaced traditional consumption with online content.

However, there does not appear to be any evidence that the market as a whole wishes to replace traditional viewing with internet delivered on-demand content. On the contrary, the growth in digital TVs and sale of digital Set Top Boxes suggests that audiences see a lot of value in traditional TV⁶ as a way of viewing their mainstream video services. This is especially true for live content such as sport, news, reality TV, etc. For the

vast majority of homes, existing terrestrial and Pay TV facilities function very well. Asking consumers to pay to re-wire their TV signal inputs from current rooftop / set-top arrangements to an IP delivered / RF overlay output from the NBN would be costly and confusing and is unlikely to result in 100% compliance particularly when considering rental accommodation, multi-dwelling units, body corporate processes, etc. This problem is aggravated because of the significant number of TV devices per home (the average Australian household has 2.3 TV receivers)⁶.

The only situation where RF Overlay delivered services may be seen favourably for delivery of FTA TV might be on newly built estates where it is expected fibre will be installed as standard (it is planned to be compulsory from later in 2010) and so planning antenna wiring to terminate at the fibre ONT rather than a rooftop antenna may be viewed favourably. Even then the relative costs versus installing a traditional antenna may need careful consideration, as already discussed.

It is not clear that the NBN will be able to deliver media / TV services to a critical geography of users that live outside the FTTH footprint. This represents a significant population that largely receive terrestrially delivered broadcast services today (currently NBN Co. is targeting 90% of households with FTTH whereas terrestrial broadcast reaches 99%). Other categories of users that will not be able to receive fixed services are those living in caravans and boats, and those using small handheld devices or portable receivers.

It is also worth noting the strong move to wireless telecommunications services generally. For example, the fastest area of broadband growth is currently wireless broadband which supports the view that end users strongly prefer mobility, portability and general flexibility⁷.

Existing Broadcasters

Most broadcasters have a significant online strategy which complements their broadcast services. This includes catch-up TV services such as ABC's iView and / or hybrid set-top box services, offering a whole new range of on-demand services such as those offered through TiVo.

However, FTA broadcasters have long term commitments to terrestrially delivered services as their primary form of content delivery. This ubiquitous, well proven technology still provides the most effective mechanism for reacting to the vast majority of viewers in a manner that is most

⁵ Costs based on discussions with various vendors, network operators and other industry commentators

⁶ For the government's own figures see www.digitalready.gov.au/digitaltracker.aspx

⁷ Reference: Communications Day, 18 November 2009, "Thodey : Telstra's future unquestionably wireless"

compatible with an ‘untethered’ future and with zero incremental costs of adding additional end users.

The commercial FTA broadcasters have requested a number of considerations in their submission on the NBN to help facilitate content distribution⁸. The most relevant to this paper is their request that the current retransmission scheme for FTA without permission should be reconsidered and that ‘rules should be introduced to prevent the removal of FTA aerial connections when the home is connected to the NBN network’.

Broadcast Australia strongly supports this latter proposal as being in the public interest as it would ensure competition and consumer choice is maximised by retaining full, open and free access to existing terrestrial services.

Existing Pay TV Providers

For similar reasons as those stated above, existing Pay TV providers (i.e. Foxtel and Austar) have long standing distribution networks through cable and satellite. Equally facilities are well established at the consumer end. These providers will also likely offer IP delivered “long tail” and catch-up services via hybrid product offerings. Thus, there appears to be limited demand to transition to an RF overlay capability on the NBN.

Unless the existing HFC networks are sold to NBN Co. they can be expected to continue to independently carry Pay TV services for some time to come.

ISPs and Other Providers

For ISPs and other service providers including Telstra, iiNet, Internode, TiVo and Fetch TV, the NBN represents a significant opportunity to provide advanced new IP delivered media services (i.e. IPTV or web delivered services). Many have or are in the advanced stages of planning the release of hybrid boxes that use terrestrial and internet / IP delivered services in a seamless manner. An RF overlay on the NBN is not necessary to deliver such seamless hybrid capability to viewers.

NBN Co. Issues and Choices

As with any new technology platform, Broadcast Australia understands that NBN Co. (and its advisers) will need to evaluate a range of issues before making decisions about how it enables the provision of media services. This includes understanding consumer preferences, looking at the likely demands for, and the cost of alternative technologies and the NBN Co.’s own remit.

NBN Co. has stated that it intends to “enable” multicast services. This will include making layer 2 “aware” of layer 3 functions such that multicast services can be provisioned in an efficient manner. This will be of particular relevance to existing and new entrants looking to offer IPTV services. There are compelling reasons to argue for a single national service provider for multicast services. NBN Co. and the Government will need to think through how this can be done whilst affording protection to consumers and users at the same time.

However, NBN Co. has stated that it is undecided about an RF overlay. According to CEO Mike Quigley (09/2009), “*the purpose of the NBN is to provide a wholesale service that enables competition and innovation by retail service providers.*” Provisioning broadcast services (especially current FTA’s) on the NBN would not appear to fall within this remit and it should be the broadcasters who decide how and if the NBN might be used to deliver such existing FTA services.

Additionally, the incremental costs of carrying FTA TV services on the NBN would need to be considered. As already set out, consumers are unlikely to pay for something they already get for free. Cross-subsidisation from the offering of other services on the NBN would raise competition concerns and would be expected to lack support from broadcasters who would not want consumer access to free to air services to be locked into a paid for bundle. Arguably this could distort competition in other parts of the broadcast ecosystem. Innovation in this space is far more likely to come from complementary services such as catch up TV, video on demand services, and alternative subscription IPTV services carried on the fibre.

The possible bundling of TV together with telephone and broadband services is a decision for layer 3 retail service providers and it is not clear that FTA broadcasters would agree to have their services sold in a bundled offering.

Consequently, RF Overlay may only be relevant for isolated situations where audiences are unable to receive Free TV or Pay TV via terrestrial, cable or satellite.



⁸ Submission by Free TV Australia Ltd to DBCDE, 3 June 2009

Summary

The cost of replicating existing terrestrial and satellite broadcast services across the NBN would be significant and does not appear to deliver greater functionality to that currently possible from existing wireless platforms. Indeed, there will remain a significant number of situations where the NBN will be unable to match terrestrially delivered services' reach and coverage and there appears to be little rationale for trying to replicate them in the first place.

Existing FTA terrestrial broadcast services deliver over 100 Mbps of wireless capacity to a greater proportion of Australian viewers than is envisaged by the NBN's 90% FTTH objective and the services are delivered free to consumers.

Consumers have already sunk investments (antenna systems, STBs, display devices, etc.) to receive Free TV via the established terrestrial broadcast networks, especially through the analogue to digital transition. Many will be reluctant to make further investment, especially for something that delivers them no incremental personal benefit.

The significant cost of trying to replicate these services on the NBN seems difficult to justify, except where specifically applicable (e.g. selected blackspots). It is also unclear how the capital cost of replication and the incremental simulcast operating costs, in the absence of 100% substitution, could be justified and paid for.

High bandwidth fibre is ideal for delivering complementary innovative new services. This is demonstrated by recent new entrants (both in Australia and globally) launching hybrid broadcast / IP delivered services through a single device. These solutions have demonstrated the use of the terrestrial network for what it does best – “mass market” linear TV - and using the internet for on-demand type services.

Finally, FTA should remain exactly that, free to consumers.



Definitions

EPG	Electronic Programme Guide
FTA	Free to Air
FTTH	Fibre to the Home
HFC	Hybrid Fibre Coaxial
IP	Internet Protocol
ISP	Internet Service Provider
Layer 2	The data link layer of the seven-layer OSI network model
Layer 3	The network layer of the seven-layer OSI network model
Mbps	Mega Bits per Second
NBN	National Broadband Network
ONT	Optical Network Terminal
RF Overlay	Radio Frequency Overlay
STB	Set-top Box

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11 February 2010