IPTV and internet video delivery models

Video content services over IP
in Australia

JUNE 2010

communicating | facilitating | regulating

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Introduction

This report is intended to provide a basic snapshot of current delivery options for content over IP in Australia.

The Australian Communications and Media Authority (the ACMA) regularly undertakes research into technology and service developments in the communications and media industries. This report is concerned with emerging Internet Protocol (IP) distribution methods for commercially developed video content, primarily the delivery of internet video over various devices including the mobile phone, the television and the personal computer (PC). Developments in the delivery of content over IP illustrate pressures occurring as a result of the convergence of the previously distinct platforms by which content is communicated. The ACMA has identified convergence occurring across nine areas of regulatory focus and to that end, the ACMA's research into IP content delivery developments provides information to assist the ACMA in developing potential regulatory responses to convergence issues.[1]

New IP content delivery models have been enabled in part by the additional bandwidth on IP networks. Both the increased amount of bandwidth available, improved compression rates and the continually evolving processes to deliver content over IP have contributed to an explosion in the availability of film and television content online. With access to a high-speed broadband service, consumers can now download a film in minutes rather than hours. Large content files such as a television program can be streamed over the internet with a reasonable expectation (though no guarantee), of a good viewing experience. The continuing improvement in the content viewing experience over the internet has encouraged the growth in content available over the internet.

At the same time, there has been growth in content delivered through digital television, which utilises existing broadcast spectrum for delivery, rather than IP content delivery (which is the focus of this report). The introduction of additional digital channels such as the Nine Network's 'Go!', Seven Network's '7Two', Ten Network's 'One HD' and 15 HD channels on Foxtel, have expanded choices and content available to viewers from both Free-To-Air (FTA) and subscription television broadcasters.

This report is concerned with the delivery of content over IP networks. These content delivery services are generally described as either IPTV or internet video services. There are various definitions for IPTV and internet video and these can be fast-changing and fluid.[2] While the terms IPTV and internet video can often be used interchangeably, there are important differences between the two. In addition, the term internet video encompasses a wide range of services from user-generated clips to television programs and films delivered over the internet, and can be called different names, including 'Internet TV' and 'Web TV' depending on the services and content provided.

This report will use the following definitions for IPTV and the 'Internet TV' and 'Web TV' versions of internet video:

> **IPTV:** This report uses the International Telecommunication Union Telecommunications Standardization Sector (ITU-T) definition of IPTV. The ITU-T defines IPTV as 'multimedia

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[1] ACMA Corporate Plan 2009-11

[2] Refer to the 2008 ACMA report, *IPTV and Internet Video in Australia*, www.acma.gov.au/WEB/STANDARD/pc=PC_311325, pages 15–17, for a more detailed discussion of the definitions of IPTV and Internet video and the differences between these services and broadcast television.

services such as television/video/audio/text/graphics/data delivered over IP-based networks managed to support the required level of QoS/QoE, security, interactivity and reliability'.[3]

> **Internet TV (Internet video):** Services that provide both on-demand and catch-up services usually from traditional FTA and subscription television broadcasters. 'Internet TV' services often have some level of management over the delivery of the content by the content provider or internet Service Provider (ISP), although the content is still delivered over the open internet.

> **Web TV (Internet video):** Video content delivered over the open internet on a best-efforts basis.

The discussion in this report is restricted to commercially-developed content delivered by internet video such as television programs and films, which are provided with content owner consent (commercially developed content). This definition of commercially developed content only incorporates content shown in its entirety, such as a full-length film or a television program, which excludes short clips of content. The report also excludes pirated material and user-generated material to allow a more comprehensive examination of new content delivery methods that complement and compete with existing modes of delivery, such as FTA and subscription broadcast television.

This report is intended to provide general information to contribute to industry and government understanding of the changing media and communications sectors in Australia. However, the ACMA would welcome any feedback on this report to industry.analysis@acma.gov.au or by writing to:

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Melbourne VIC 8010

Examples of services and companies are used throughout this report to illustrate points and show who is operating in various market sectors. These examples are not a complete list of all applicable services or companies and the ACMA is not to be taken to be endorsing these services mentioned.

Purpose

The ACMA has undertaken this research into the provision of IPTV and internet video over various devices as part of an ongoing research program about the application of emerging technologies. This report is intended to:

> provide a taxonomy of delivery models used to provide internet video and IPTV services in Australia

> outline the role of different industries in the provision of internet video and IPTV

> discuss the commercial environment in which these services are operating.

This report serves as an update to the 2008 ACMA report, *IPTV and Internet Video in Australia*. Rather than repeat commentary and technical details from this earlier report, this report will indicate where more information can be found in the 2008 report.[4]

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[3] International Telecommunication Union – Telecommunications, IPTV Joint Coordination Activity, Definition of IPTV, viewed 20 January 2010, www.itu.int/ITU-T/jca/iptv/index.html

[4] The 2008 ACMA report, *IPTV and Internet Video in Australia* can be found at: www.acma.gov.au/WEB/STANDARD/pc=PC_311325.

Research background and methodology

The analysis and commentary in this report draws on the following information sources:

> third-party consumer data purchased by the ACMA and consumer behaviour survey commissioned by the ACMA

> industry analyst reports

> company reports and announcements and news reports.

Summary

The Australian experience

The content delivery environment in Australia is rapidly changing as greater amounts of content are available through devices and platforms other than the cinema, the VCR/DVD player and FTA and subscription television. In addition, the digital terrestrial platform has allowed broadcasters to offer supplementary channels and consequently, more content. There are now a variety of ways and devices on which to access content, including game consoles, internet-ready televisions, and mobile phones. Content rights holders are experimenting with online delivery and new entrants and ISPs are increasingly offering new content services. Examples include:

> **Australian FTA and subscription broadcaster websites** offer recently screened content for viewing

> **TiVo**, an internet-ready set-top box (STB), enables users to access film and television content[5]

> **Sony Australia (Sony)** has launched the Sony BRAVIA television set with access to on-demand catch-up television content from the Seven Network and SBS[6]

> **Telstra Corporation Limited (Telstra)** has recently launched the set-top T-Box (17 June 2010). T-box consists of a personal video recorder providing access to FTA television, seven BigPond TV channels including sports, news and music, and a library of on-demand movies.[7]

> **Microsoft Corporation (Microsoft)** has recently launched an online video service in Australia for the Xbox 360.[8]

Consumers are increasingly able to choose when, where and how they access and consume content.

When the ACMA last reported on developments in IPTV and internet video services in April 2008, the only known Australian providers of IPTV services were TransACT Capital Communications Pty Ltd (TransACT) and TPG Internet Pty Ltd (TPG).[9] While further IPTV developments have been slow to emerge, there has been some further activity in this area in the first six months of 2010. For example, iiNet and FetchTV have announced a partnership to offer IPTV services to iiNet customers, with trials of the service taking place since April 2010, and the service expected to launch in mid 2010.[10] IPTV services are now being provided by television set manufacturers such as Sony and LG, utilising the built-in internet connection capabilities of their 2010 ranges of television sets. Set-top box services provided by Telstra's T-box, and the TiVo are also delivering IPTV services to consumers providing a material increase in the range of choices available to Australian consumers.

Delivery models

The report finds that while the traditional free-to-air and subscription TV broadcast delivery models continue to form the backbone for video and television service delivery in Australia, there has recently been a significant increase in the number of alternative distribution methods.

The ACMA has outlined several new models for delivering content to the consumer. These new models include:

1. Mobile TV (broadcast)—television content is distributed to mobile devices over a broadcast network, and although it is being trialled, is yet to be launched commercially in Australia.

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[5] TiVo website, accessed 31 March 2010, www.mytivo.com.au/whatistivo/moviestvmusic/entertainmentondemand.

[6] Sony, *Ride the new wave: BRAVIA Internet video opens up a world of TV on-demand*, media release, 23 February 2010.

[7] Telstra, *Telstra T-Box brings BigPond TV, internet entertainment and on-demand movies to Aussie TVs*, media release, 1 June 2010.

[8] Xbox 360 website, accessed 8 April 2010, http://marketplace.Xbox.com/en-AU/videos/default.htm.

[9] ACMA, *IPTV and Internet Video Services: The IPTV and Internet Video Market in Australia*, April 2008.

[10] *iiNet to launch FetchTV as IPTV service 'soon'*, Exchange Daily, 13 April 2010.

2. IPTV—content is offered by ISPs, television set manufacturers and independent set-top box providers over an IP network in a similar fashion to subscription TV.

3. 'Web TV' (Website)—many websites offer commercially developed content on a best-effort basis. Web TV can also be offered on a pay-per-view (PPV) basis. Occasionally new content is also produced specifically for the web.

4. 'Internet TV' (Website)—typically catch-up television from FTA and subscription broadcasters, Internet TV is gaining popularity in Australia.

5. Independent set-top boxes (STBs)—devices offered by operators other than subscription television providers, offering access to content delivered over the internet, as well as other services such as recording functionality. This also includes some personal video recorders (PVRs) which now provide access to IPTV services.

6. Game consoles—console manufacturers providing access to film and television content over IP connections, with content typically provided on a per-per-view basis.

7. Mobile video—typically offered by mobile service providers but can be offered by independent operators with a presence on the internet that produce content specifically tailored to delivery onto mobile devices.

All of these models are currently employed in Australia with the exception of Mobile TV. However, it is noted that several of these models may be employed for the one service or by the one provider. For example, Foxtel is a subscription broadcaster and also provides content for website and mobile device delivery. The fast-changing and global nature of this industry means that, while the characteristics assigned to these models are typical, variations are to be expected.

While these service delivery models are still in their infancy in Australia, the report presents data that suggests that internet video viewing is becoming more common among consumers and will continue to grow as bandwidth capacity expands and data speeds increase.

Commercial environment

The shift to an all-IP world facilitated through developments such as the planned National Broadband Network (NBN) could further encourage the take-up of IPTV and internet video services in Australia.

The availability of the same content on different devices will influence consumer viewing behaviour. Consumers will increasingly expect to be able to access commercially-developed content when, where and how they want, increasing the fragmentation of audiences. This will be further encouraged as more devices are equipped with 'smart' technology, where functionality is built into the device, rather than the network. Current business models associated with content provision and distribution will come under mounting pressure as a result of both audience fragmentation and changing consumer expectations and behaviour. In turn, this will have ramifications for content owners, distributors and regulators as content distribution models in Australia continue to evolve.

Definitions

Video services over IP

There are a variety of ways to deliver video services over IP networks. Delivery methods can differ depending on what material is distributed, the capacity of the core and access networks to deliver services, the relationship between content providers and end users, and end-user equipment used to display content. The models used to distribute content will evolve as new processes are developed to make better use of current and emerging techniques.

A number of terms are associated with the processes used to deliver video content over IP networks. The terms explored in this report are IPTV and internet video, also called 'Web TV' and 'Internet TV.' There are a multitude of interpretations of the term, IPTV. This report uses the ITU-T definition, which defines IPTV[11] as 'multimedia services such as television/video/audio/text/graphics/data delivered over IP-based networks managed to support the required level of Quality of Service (QoS)/Quality of Experience (QoE), security, interactivity and reliability'.

The IPTV services discussed in this report generally refer to services delivered to television screens, rather than PC screens. When providing linear channels (not on-demand content), these services use a delivery technique known as multicasting, which optimises the available bandwidth on managed networks by routing packets only to the required destinations from the nearest available point within the network. This one-to-many or many-to-many technique is more efficient than a one-to-one unicasting technique which is typically used to deliver on-demand content. Internet videos,[12] which can also be called Web TV, differ from IPTV services in that they are mainly viewed on personal computers and generally delivered 'over-the-top' of unmanaged broadband networks such as the internet.

'Internet TV' is a term used within the umbrella of internet video to denote services that provide both on-demand and catch-up services usually from FTA and subscription broadcasters. The service is delivered over a broadband network data service (over-the-top) and can be distributed in several ways including via the internet. Typically Internet TV and Web TV use a delivery technique known as unicasting that is a one-to-one transmission between the receiving client and video server. When compared to multicast based services for wide service distribution, unicasting requires significantly more bandwidth. These services usually have some level of management over the delivery of the content by the content provider or the ISP, either through 'anycasting', where a specific pathway for traffic is provided to users, or caching, where the provider arranges a local cache for users of the content.

Table 1 provides an outline of the main differences and similarities between IPTV, internet video or Web TV, and Internet TV.

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[11] International Telecommunication Union – Telecommunications, IPTV Joint Coordination Activity, *Definition of IPTV*, viewed 20 January 2010, www.itu.int/ITU-T/jca/iptv/index.html.

[12] ITU, ICT Regulation Toolkit, accessed 1 April 2010, www.ictregulationtoolkit.org/en/Section.3422.html.

Table 1 Comparing IPTV, 'Web TV' and 'Internet TV'

| | IPTV | Internet video | |
		'Web TV'	'Internet TV'
Delivered to...	Set-top box (STB) or an internet-capable television set	Website, sometimes STB or other device	Website, sometimes STB or other device
Network characteristics	Closed access	Typically open access	Can be closed or open access
	Managed	Best-efforts	Some management
	IP multicast	IP unicast	IP unicast
Content	Commercially developed content	Can be clips or commercially developed content	Typically commercially developed content

Note: The characteristics of these different models (IPTV, 'Web TV' and 'Internet TV'), are explored in more detail in the 'Delivery models' section of this report (see table 2).

The focus of this report is restricted to IPTV and internet video services delivered to various devices that provide commercially developed content in its entirety (as opposed to clips) that is provided with content owner consent (commercially developed content). This selection excludes pirated content and clips of commercially developed content. Restricting the focus of this report to commercially developed content allows a greater depth of analysis on competing and complementary services to traditional models of content delivery such as television and cinema.

Managed versus best-efforts service delivery

Best-efforts service delivery describes a communications service that makes no guarantees regarding the speed with which data will be transmitted to the recipient or that the data will even be delivered entirely. Conversely, a managed service is one that requires a 'better than best effort' delivery paradigm, with service-level guarantees (see also Table 3).

As additional bandwidth becomes available and more efficient processes are developed to manage content delivery, the distinction between a service delivered over a managed network (IPTV) and one delivered with various levels of management (internet video) may become less important as both services will provide an acceptable level of quality to the user. Several techniques such as file downloading and video image compression were developed to ensure timeliness and quality of content delivery. Downloading offers files with video content for viewing at a later time, and requires no special video related processes. In the current environment, downloading of content continues to be a technique utilised by some content providers, despite recent increases in data speeds, as not all consumers have access to, or are willing or able to pay for faster internet speeds that may allow reliable streaming of content. With higher speeds due to improved broadband access technologies, downloaded video files can provide longer and higher resolution content and so act as an online replacement for video stores.

A further technique, developed in an era when bandwidth scarcity was a concern, was video image compression.[13] Video compression techniques reduce the bandwidth requirements for video

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[13] OECD, *DSTI/ICCP/CISP(2006)5/FINAL; IPTV: MARKET DEVELOPMENTS AND REGULATORY TREATMENT*, 19 December 2007, page 8.

services, which, combined with the increasing availability of higher bitrate access services, enhance the viability of providing video services over IP access services.

Overview

The big picture

Traditionally, consumers sourced commercially developed content through FTA or subscription television, VCRs or DVDs, or the cinema. While the VCR/DVD player added some element of control to audiences' consumption of content, commercially developed content on the whole was seen at scheduled times decided by television FTA and subscription broadcasters or cinemas. While subscription broadcasters provided a greater array of channels than FTA broadcasters, the majority of that content was broadcast through linear channels.

Commercially developed content is now available from a wider variety of sources including internet sites such as iTunes, often on an 'on-demand' basis. In addition, the digital terrestrial platform has allowed FTA broadcasters to offer supplementary linear channels. Audiences are becoming active consumers, choosing the time, place and mode of their content consumption.

At the same time, industries that previously had no involvement in content delivery have begun to offer commercially developed content through such means as online retail sites and internet-ready hardware. For example, many mobile phone service providers are offering re-packaged broadcast television content to their users. The commercially developed content environment of timetabled broadcasting on television and cinema screens has diversified to enable users to choose when, where and how they consume and interact with content on multi-functional devices. Figure 1 shows the traditional content delivery participants.

Figure 1 Traditional participants in content delivery (with examples of providers)
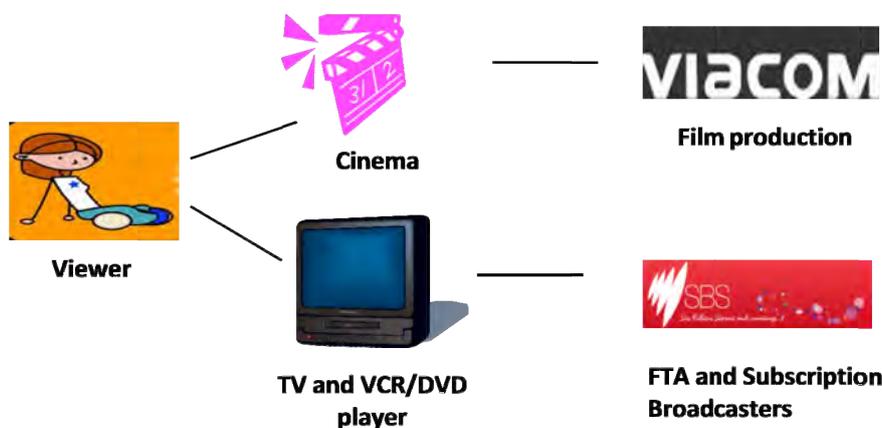
In the traditional environment, the consumer had limited ability to watch content on their own terms. Content was produced and then accessed by consumers according to distribution "windows" devised for different delivery mechanisms. The traditional distribution windows for film content are shown in Figure 2. Additional windows for the distribution of content are emerging as the number of delivery models for the provision of content grows. For example, there are now distribution windows for the release of content through internet video services. As new delivery platforms emerge, there are opportunities for content producers to experiment with delivery windows to maximise their revenue.

Figure 2 Traditional distribution windows for film content
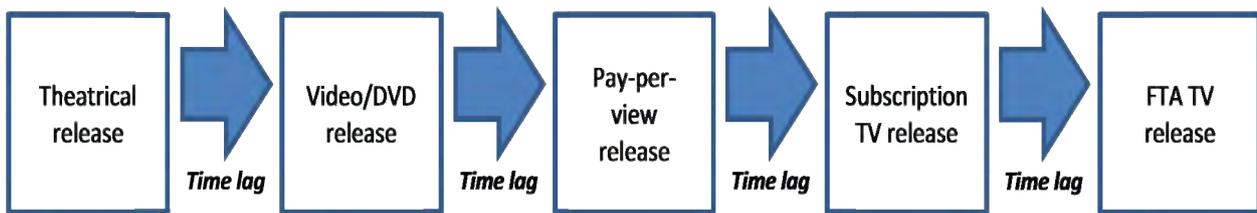
Source: Larry Elin, From Windows to Screens: a new distribution model for films, NavigateNewMedia The S.I. Newhouse School of Public Communications, 9 February 2010.

Figure 3 shows the emerging content delivery environment where consumers have a multitude of devices with which to access content. Consumers can now view the same content not only at the cinema and on the television but through other devices, including their computer and mobile phone. In addition, the number of participants in content distribution has increased as other industries have entered the market. For example, online retailers such as Amazon.com Inc (Amazon) are now providing video on-demand services.[14]

Distribution windows still exist although they are becoming increasingly fluid as content owners experiment with different release strategies in response to the rapid increase in alternative distribution mechanisms. For example, the Steven Soderbergh film, *Bubble*, was released simultaneously to theatres, subscription television and DVD in 2006.[15] Sony released the 2009 film, *Cloudy with a Chance of Meatballs*, on the internet before it was available on DVD.[16]

The increase in new distribution mechanisms and devices can be seen both internationally and in Australia. Globally, FTA and subscription broadcasters are offering catch-up TV services over the internet and through partnerships with IPTV and subscription TV providers.

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[14] Amazon website, accessed 31 March 2010, www.amazon.com/Video-On-Demand/b/ref=sa_menu_atv1?ie=UTF8&node=16261631&pf_rd_p=328655101&pf_rd_s=left-nav-1&pf_rd_t=101&pf_rd_i=507846&pf_rd_m=ATVPDKIKX0DER&pf_rd_r=1WD76ME48NSFX81T1HNZ%20.

[15] Xeni Jardin, *Thinking Outside the Box Office*, Wired, December 2005, accessed 30 March 2010, www.wired.com/wired/archive/13.12/soderbergh.html.

[16] Larry Elin, *From Windows to Screens: a new distribution model for films*, NavigateNewMedia The S.I. Newhouse School of Public Communications, 9 February 2010.

Figure 3 Emerging content delivery environment (with examples of providers)

Independent websites such as YouTube are offering commercially developed content in addition to clips. New entrants to content distribution, such as Amazon and Apple Pty Ltd (Apple), are offering their own content services, with Google recently announcing plans to launch its Google TV platform in late 2010.

There has been a major increase in alternative distribution methods for content in Australia, although many of these services as at June 2010 are at trial stage or have only recently been announced. iTunes Australia began offering full-length films for download in August 2008.[17] In addition, the popular United States online video website, Hulu, has announced that Australia is in the top ten list of potential countries for expansion of its service.[18]

Freeview, the brand representing the digital terrestrial television platform in Australia comprising all the FTA channels, is reported to be exploring internet delivery options for broadcast content.[19] In addition to the existing IPTV services of TransACT and TPG, iiNet has announced a partnership with FetchTV to provide IPTV services. Trials of the service are understood to have commenced in April 2010.[20] Internet-capable television sets such as the Sony Bravia and LG Netcast ranges are now providing IPTV services, with Sony offering 'catch-up' television content from the Plus7 and

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[17] Apple website, *Apple Premieres Movies on the iTunes Store in Australia and New Zealand*, media release, 14 August 2008, accessed 1 April 2010, www.apple.com/au/pr/library/2008/08/14itunes.html.

[18] Simon Tsang, *Australian TV in the sights of Hulu, the web untangler*, Sydney Morning Herald, 20 February 2010, accessed 1 April 2010, www.smh.com.au/technology/technology-news/australian-tv-is-in-the-sights-of-hulu-the-web-untangler-20100219-olrf.html.

[19] Paul McIntyre, *Networks give in to internet TV*, Businessday, 27 November 2009, accessed 1 April 2010. http://www.businessday.com.au/business/networks-give-in-to-internet-tv-20091126-jusl.html

[20] *iiNet to launch FetchTV as IPTV service 'soon'*, Exchange Daily, 13 April 2010.

SBS websites, and LG providing content from BigPond TV and Movies.[21] In addition, the Australian release of the iPad from Apple offers another alternative device on which to consume content.

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[21] Sony, *Ride the new wave: BRAVIA Internet video opens up a world of TV on-demand*, media release, 23 February 2010.

Delivery models

Overview

This section outlines identified delivery models utilised in the provision of content over IP, the participants in distribution, the technical underpinning of these services, and the devices to which they are delivered. A matrix demonstrating a taxonomy of delivery models has been used to summarise the different models employed in the delivery of content over IP and how they compare to more traditional methods of broadcasting content.

Matrix

The models shown in the matrix show the mix of traditional and emerging ways of delivering commercially developed content. The matrix is intended to showcase the different ways content can be delivered to different platforms for viewing. One service, or one provider, may employ elements of several of the models. For example, an ISP may offer IPTV and may also provide access to selected internet video content as an addition to the service. In Australia, Foxtel Management Pty Ltd (Foxtel), a subscription broadcaster, offers subscribers access to content via its website in addition to their subscription television service.[22]

Models in the matrix

1. FTA television

FTA television is provided to consumers by government-funded, community or commercial broadcasters on a no charge basis. Content is broadcast over a one-to-many network to any household with a television and aerial, and is distributed on a linear basis with programming shown at a scheduled time. FTA broadcasters in Australia include the:

> Australian Broadcasting Corporation (ABC) (government-funded; offers four channels: ABC1, ABC2 ABC3 and ABC HD)

> Community television broadcasters (privately funded,[23] non-profit: In October 2009, there were 81 community television broadcasting licensees – comprising 76 licensees in remote areas, and 5 in metropolitan areas)

> Special Broadcasting Service (SBS) (government-funded supplemented by advertising revenues; offers three channels: SBS1, SBS2 and SBS HD)

> Seven Network (commercial; offers three channels: 7, 7 HD and 7Two);

> Nine Network (commercial; offers three channels: 9, 9 HighDef and Go!)

> Ten Network (commercial; offers three channels: Ten, One HD and One)

> Regional broadcasters (commercial; availability differs according to location; includes WIN Television, Prime Television, Southern Cross Television, and Imparja).

2. Subscription television

Subscription television is provided by subscription television broadcasters. Consumers can access linear channels and some on-demand content on a subscription basis. Premium on-demand, near on-demand and special event content is typically available on a pay-per-view (PPV) basis. The major subscription broadcasters in Australia are Foxtel and Austar.

3. Mobile TV

Mobile TV is television content distributed to mobile devices over a broadcast network via Digital Video Broadcasting – Handheld (DVB-h), as opposed to mobile video, which can offer the same content but is transported over an IP network. While mobile broadcasting networks

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[22] Foxtel website, www.foxtel.com.au, accessed 17 March 2010.
[23] Australian community television broadcasts are funded though a range of means, including sponsorship, subscriptions and donations, membership fees, grants, merchandise sales and sale of air time to program providers.

have been trialled in Australia,[24] none have been launched commercially as at June 2010. Mobile TV services are typically provided on a subscription basis. Content is provided on a linear basis.

4. IPTV

In the context of this matrix, the IPTV delivery model provides a subscription TV-like service over an IP network managed for quality of customer experience. Traditionally, IPTV services have been offered by ISPs utilising a set-top box, as the service requires an ability to manage the IP delivery network. However commencing in 2010, television set manufacturers have begun to offer internet-capable television sets which provide IPTV services utilising the hardware and software incorporated into the television set. There are a mix of revenue models utilised with IPTV services depending upon the type of content and delivery being offered and how established the service is. For example, TPG's trial IPTV service is offered at no charge to ADSL2+ customers on selected exchanges, while TransACT offers a subscription TV-like service on a subscription and pay-per-view (PPV) basis. Television manufacturers such as Sony and LG provide IPTV services across their 2010 television ranges, with Sony selling twenty-one Bravia television models, and LG twenty television models capable of delivering internet content. It is understood that Sony provides access to twenty Bravia internet video channels, which include made-for-the-internet content from Billabong, DailyMotion, and YouTube, and catch-up television services from Plus7, SBS and ABC iView.[25] LG provides access to Telstra's BigPond TV and Movies service, providing a range of television content on a free and on-demand basis and movies on-demand.

5. Web TV – Website

Many websites offer commercially developed content on a best-efforts basis. These websites offer a mix of television and film content. Occasionally new content can be created for these websites and can involve established television content producers. For example, Hulu aired a three-part musical created by Joss Whedon, also known for the cult hit television show *Buffy the Vampire Slayer*.[26] The creator of cult hit *Family Guy* produced a series of cartoons, *Seth McFarlane's Cavalcade of Cartoon Comedy*, that originally aired on YouTube and SethComedy.com (now a YouTube channel).[27] Revenue models vary, depending upon who is offering the service and the content offered. For example, a new entrant offering high value film and television content may use a PPV model.

6. Internet TV – Website

'Internet TV, like 'Web TV', offers commercially developed content. 'Internet TV' offers on-demand and 'catch-up' television services, usually from FTA and subscription broadcasters. 'Internet TV', although it is delivered over the open internet, often employs some management techniques for content delivery, such as caching or anycasting.

7. Independent set-top boxes

Independent set-top boxes are devices offered by operators other than subscription television providers. These set-top boxes offer access to content delivered over the internet, as well as other services such as recording functionality. While typically offered by new entrants, more established ISPs have also experimented with offering set-top boxes. An example is Telstra's T-box, which has been trialled in early 2010 and was launched in June 2010. T-box is only available with an eligible BigPond Broadband service and consists of a personal video recorder providing access to FTA television and YouTube, seven BigPond TV channels

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[24] Broadcast Australia website, accessed 31 March 2010, www.broadcastaustralia.com.au/innovative-broadcasting/mobile-tv-trials.

[25] Sony Australia, *Sony strengthens its IPTV offering in Australia*, media release, 12 April 2010.

[26] Carol Krol, *Television's new picture: Seismic shifts in the digital age*, eMarketer, September 2008, pages 5–6.

[27] WebTVWire, '*Seth McFarlane scores a hit with 'Cavalcade of Comedy'*, 12 September 2008, accessed 14 April 2010, www.webtvwire.com/seth-macfarlane-scores-a-hit-with-cavalcade-of-comedy-most-popular-video-on-youtube/.

including sports, news and music, and a library of on-demand movies.[28] Revenue models differ depending upon the partnerships established with content providers.

8. Game consoles

Game consoles can now access the internet and console manufacturers are now starting to deliver film and television content over that IP connection. These connections are often on a best-efforts basis as the console acts as a connection between the television set and the internet without any influence on the performance or viewer experience. Content is typically available on a pay-per-view (PPV) basis. Sony launched the PlayStation Network Video Delivery Service on 20 May 2010, providing access to movies through PlayStation 3 and PlayStation Portable devices. PlayStation 3 also provides access to ABC iView content through the PlayTV service which combines a personal video recorder and high definition set-top box functionality.[29] Foxtel has announced a partnership with Microsoft to make Foxtel subscription television accessible over the internet and direct to television sets through the Xbox 360 online service Xbox Live late in 2010.[30]

9. Mobile video

Mobile video is typically offered by mobile service providers but can be offered by independent operators with a presence on the internet that produce content specifically tailored to delivery onto mobile devices. Services offered by mobile providers are available only to their subscribers, while internet-based offerings are usually open access. Content is usually paid for on either a subscription or PPV basis.

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[28] Telstra, *Telstra T-Box brings BigPond TV, internet entertainment and on-demand movies to Aussie TVs*, media release, 1 June 2010.

[29] Sony, *PlayStation set to revolutionise home entertainment in 2010*, media release, 18 May 2010.

[30] Foxtel, *Foxtel and Microsoft Sign Ground-breaking Xbox Agreement*, media release 20 May 2010.

Table 2 Taxonomy of content distribution models: Part 1, Broadcast television

		Broadcast television		
		FTA Television	**Subscription Television**	**Mobile TV**
	Description of service*	Television delivered over broadcasting network at no charge to consumers.	Television delivered over broadcasting network on a subscription and PPV basis.	Content delivered to a mobile device over a broadcasting network
Delivery Method	**Delivered to...**	TV via analogue or digital delivery	TV (via STB)	Mobile phone
Network characteristics	**Managed/best-effort**	N/A	N/A	N/A
	Controlled access/open access	Open access	Controlled access	Controlled access
	Streamed/downloaded	N/A	N/A	N/A
	Network type	Television broadcast spectrum	Cable and satellite networks	Mobile broadcast spectrum**
	Broadcast/IP	Broadcast	Broadcast	Broadcast
Content type	**Television programs**	Yes	Yes	Yes
	Film	Yes	Yes	Yes
	New commercially developed content created for service	Yes	Yes	Yes
	Catch-up TV	Yes, via internet	Yes, via internet	No
Revenue models (excludes special offers)	**No charge and no advertising**	Yes (government funded)	No	No
	No charge; advertising supported	Yes (commercial networks)	No	No
	Subscription	No	Yes (for suite of channels)	Yes
	PPV	No	Yes (for special content)	No
Other characteristics	**Timing**	Linear	Mix of linear, near on-demand and VOD	Linear
	Providers	Commercial and government funded broadcasters	Subscription television broadcasters	Mobile operators***
	User experience	High quality resolution	High quality resolution	Low quality resolution
	Example service (Australian unless otherwise noted)	ABC; SBS; Seven Network; Nine Network; Ten Network	Foxtel; Austar	Not offered in Australia. Verizon (USA); AT&T (USA)

*Note: These characteristics are typical for these delivery models, however there may be exceptions.

** Note: Trials of mobile TV in Australia have been conducted on the broadcasting G23 services band. However, commercial deployments would likely take place on allocated mobile broadcast spectrum. ***Note: Trials in Australia have been conducted by Broadcast Australia.

Table 2 (continued): Taxonomy of content distribution models: Part 2, IPTV and internet video (websites)

		IPTV	Delivery mechanisms of content in internet video services	
			Website–'Web TV'	Website–'Internet TV'
	Description of service**	Subscription-TV like service	Websites offering content on a best-efforts basis.	Websites offering on-demand and catch-up content services.
Delivery Method	**Delivered to...**	TV (via STB); Internet-capable TV's; sometimes PC	PC; sometimes TV	PC; sometimes TV
Network characteristics	**Managed/best-effort**	Managed	Best effort	Typically some management
	Controlled access/open access	Controlled access	Open access	Open access; sometimes controlled access
	Streamed/downloaded	N/A	Streamed and downloaded	Streamed and downloaded
	Network type	Typically fixed DSL or fibre network	Can be any internet network.	Can be any internet network.
	Broadcast/IP	IP multicast for linear channels; IP unicast for on-demand content.	IP unicast	IP unicast
Content type	**Television programs**	Yes	Yes	Yes
	Film	Yes	Yes	Yes
	New commercially developed content created for service	Not typically	Still fairly unusual	Still fairly unusual
	Catch-up TV	Yes	No	Yes
Revenue models (excludes special offers)	**No charge and no advertising**	Rarely	Not typically	Not typically
	No charge; advertising supported	Rarely	Yes	Yes
	Subscription	Yes	No	No
	PPV	Yes	Yes	Yes
Other characteristics	**Timing**	Mix of linear and on-demand	On-demand	On-demand
	Providers	ISPs; television set manufacturers; set-top box service providers.	Mix of FTA and subscription broadcasters, content owners, ISPs and new entrants*	
	User experience	High quality resolution	Low to high quality resolution	Typically high quality resolution
	Example service (Australian unless otherwise noted)	TransACT; TPG; iiNet and Internode with FetchTV; Sony Bravia;	*iTunes Australia; BigPond TV and Movies; Plus7; ABC iView; Hulu (USA); YouTube (USA)	

*Note: Providers and examples for 'Web TV' and 'Internet TV' are not differentiated as the processes used by websites offering content are constantly changing.

**Note: These characteristics are typical for these delivery models, however there may be exceptions.

Table 2 (continued): Taxonomy of content distribution models: Part 3, Internet video

		Various delivery mechanisms of content in internet video services		
		Independent set-top boxes	**Game consoles**	**Mobile video**
	Description of service*	STBs that offer connection to internet video content	Games consoles that offer access to internet video	Content tailored to a mobile device
Delivery Method	**Delivered to...**	TV	TV	Mobile
Network characteristics	**Managed/best-effort**	Typically some management	Typically best effort	Best effort
	Controlled access/open access	Controlled access	Controlled access	Open or controlled access
	Streamed/downloaded	Streamed and downloaded	Streamed and downloaded	Streamed and downloaded
	Fixed network/Mobile	Can be any IP network	Can be any IP network	Mobile network
	Broadcast/IP	IP unicast	IP unicast	IP unicast
Content type	**Television programs**	Yes	Yes	Yes (typically short clips)
	Film	Yes	Yes	No
	New commercially developed content created for service	No	No	Sometimes
	Catch-up TV	No	No	No
Revenue models (excludes special offers)	**No charge and no advertising**	Rarely	Rarely	No
	No charge; advertising supported	Rarely	Rarely	No
	Subscription	Yes	No	Yes
	PPV	Yes	Yes	Yes
Other characteristics	**Timing**	On-demand	On-demand	On-demand and sometimes linear
	Providers	Often new entrants	Game hardware manufacturers	Content owners, mobile operators
	User experience	Typically high quality resolution	Typically high quality resolution	Low quality resolution
	Example service (Australian unless otherwise noted)	TiVo; Telstra's T-box	Microsoft Xbox 360; Sony PlayStation 3	Telstra, Vodafone, Three, Optus

Note: These characteristics are typical for these delivery models, however there may be exceptions.

Table 3 Terms used in the matrix

Matrix characteristic	Description
Delivery method	
Delivered to	The devices to which the content is delivered. This may be a television, a computer, or a mobile device.
Network characteristics	
Managed/best effort	This differentiates between networks where content delivery is managed to provide quality control to ensure a good viewer experience (managed) and content delivered over the open internet on a best-efforts basis.
Controlled or open access	This differentiates between services that are only open to certain customers, usually subscribers, (controlled access) and services that are open to anyone who can access the internet (open access).
Streamed/downloaded	Streaming allows a customer to access content as it is delivered to their computer or other viewing device. When a customer downloads content, the entire content file transported to the customer's viewing device before accessing the content.
Network type	This differentiates between fixed IP networks, which can be DSL, HFC or fibre-based, satellite-based networks, mobile 3G networks and broadcasting networks.
Broadcast/IP	This term differentiates between services that are transmitted over a broadcasting network (one-to-all) and those that use IP unicast (one-to-one) and IP multicast (one-to-many) to distribute content.
Content type	These rows show the types of content typically offered by these models: television programs, films, new content, that has been created especially for the service, and catch-up TV, which is television programming made available to consumers for a limited time period after initial airing on a broadcast network.
Revenue models	The four models are: > No charge (no advertising): The consumer can access the content for no charge. There is no advertising. > No charge (advertising supported): The consumer can access the content for free. Advertising is part of that content. > Subscription: The customer pays a monthly fee to have access to a range of content. > PPV: The consumer pays for each piece of content individually as they consume it. Models utilise different revenue models depending upon the type of service offered, its maturity and the partnerships involved.

Other characteristics	
Timing	This row outlines how the consumer accesses the content. Linear refers to content shown at an appointed time. Near on-demand refers to content, typically a full-length film, that is shown on a multitude of channels at staggered intervals, such as every half-hour, that allows the consumer to have a near on-demand experience although they are still subject to the scheduling of the content provider. On-demand is when the consumer can choose when to access the content. Content delivered over IP is typically on-demand.
Providers	The providers types identified are: > FTA broadcasters: These include both government funded and commercial broadcasters, such as ABC and the Ten Network. > Subscription broadcasters: These are broadcasters that provide subscription television services, such as Foxtel and Austar. > Content owners: These are organisations that create and own content but aren't necessarily broadcasters. This would include entities such as film houses and owners of film houses, such as Sony. > ISPs: These are Internet Service Providers, such as Telstra and Optus. > Mobile operators: These are mobile service providers, such as Vodafone. > New entrants: These are organisations that are not traditionally associated with content production and distribution. Examples include computer manufacturers, such as Apple, and television set manufacturers such as Sony. Note: Some entities will fit into several of the categories. For example, Telstra is both an ISP and a mobile operator.
User experience	This line refers to how the consumer visually experiences the content. This can range from low resolution, typical of mobile devices and open content websites such as YouTube, to high resolution, typical of broadcast television and IPTV.
Example services	This line provides examples of what services would fit under each model. Australian examples are used when available.

Providers

Different industries see diverse opportunities in the delivery of content over IP. This section discusses the different drivers, both opportunistic and defensive, for participants delivering internet video and IPTV services.

FTA and subscription broadcasters

Content distribution over IP could present both a threat and an opportunity for FTA and subscription broadcasters. IPTV, internet TV and other IP-based services represent a competing delivery platform to broadcast networks and so have the potential to threaten the audience size of broadcast network programming. At the same time, the new distribution models (see table 2 for a taxonomy of content distribution models) offer an opportunity for broadcasters to reach new audiences with their content and retain existing viewers who are increasingly using the internet to access content.

The threat and opportunity presented by IP content distribution differs somewhat for government-funded, as opposed to commercial and subscription broadcasters. Government-funded broadcasters have more flexibility to experiment with these new modes of delivery as they do not have the same commercial imperatives of retaining audience share to ensure stable or growing revenues. In contrast, commercial and subscription broadcasters need to balance experimentation with new modes of delivery and potentially new revenues while protecting their existing advertising or subscription revenues. Examples of broadcasters' online ventures in Australia include ABC iView, the Plus7 website for Seven Network content, and Foxtel's website offering a wide variety of content for existing subscribers.

Catch-up television

Much of the commercially developed content on offer from FTA and subscription broadcasters is in the form of catch-up television. Typically this allows users to watch a recent episode of a television program over the internet for a limited period of time. One example is the Plus7 service offered by the Seven Network. Episodes from various television programs are available for streaming from the website for seven to 28 days after broadcast.[31] ABC iView content is also available for streaming for up to 30 days.[32]

In Australia, FTA and subscription broadcasters' experimentation with IP content delivery has primarily concentrated on offering content on their own websites, although partnerships with other providers have been formed. For example, the ABC allows iView content to be shared on other platforms, including Facebook[33] and the PlayStation 3 console.[34] Several ISPs, including iiNet and Internode, allow subscribers to download ABC iView content unmetered.[35] Plus7 and SBS content is available through the internet–ready Sony BRAVIA television.[36] Table 4 outlines examples of Australian FTA and subscription broadcasters' IP offerings.

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[31] Plus7 website FAQ section, accessed 31 March 2010, http://au.tv.yahoo.com/plus7/faq/-/6628748/.

[32] ABC iView website. FAQ section, accessed 31 March 2010, www.abc.net.au/tv/iview/faq.htm.

[33] Angus Kidman, *ABC adds Twitter, Facebook features to iView*, Lifehacker, 28 April 2009, accessed 17 November 2009, www.lifehacker.com.au/2009/04/abc-adds-twitter-facebook-features-to-iview/.

[34] Ty Pendlebury, *Sony ramps up PlayStation 3 video content*, CNET Australia, 24 November 2009, accessed 25 November 2009, www.cnet.com.au/sony-ramps-up-playstation-3-video-content-339299683.htm.

[35] ABC website, accessed 31 March 2010, www.abc.net.au/tv/iview/isp.htm.

[36] Sony, *Ride the new wave: BRAVIA Internet video opens up a world of TV on-demand*, media release, 23 February 2010.

Table 4 Selected IP offerings of Australian broadcasters

Company	Primary service	Service**	Content	Revenue model
Foxtel	Subscription broadcaster	Foxtel website	Selected content from Foxtel service.	No charge for existing subscribers.
		Fox Sports website	Current English Premier League content.	Subscription for various time periods: 9 day pass, monthly pass, or season pass.
		Mobile Foxtel	Selected content from some Foxtel channels.	Subscription and Pay-Per-View: Subscriptions to content on a 24 hour, monthly, 3 month, 6 month or 12 month basis. Pay-Per-View from 50 cents per clip.
ABC	Government-funded FTA broadcaster	ABC iView website	Recently screened ABC content and some content exclusive to the iView website.	No charge (no advertising).
SBS	Government-funded FTA broadcaster*	SBS website	Recently screened SBS content.	No charge (advertising supported).
Seven	Commercial FTA broadcaster	Plus7 website	Recently screened Seven Network content.	No charge (advertising supported).
Nine	Commercial FTA broadcaster	ninemsn website	Nine Network content. Majority are short clips.	No charge (advertising supported).
Ten	Commercial FTA broadcaster	Channel Ten website	Recently screened Ten Network content.	No charge (advertising supported).

*SBS also supplements income with advertising revenue.
**Services may be available from other devices and applications in addition to what is noted in the table.
Source: broadcaster websites.

> **Foxtel: content over three screens[37]**
>
> As devices able to deliver content over IP multiply, content owners and broadcasters are exploring the opportunity to offer services over multiple screens. Foxtel is currently offering its content over three screens or platforms: the television, the computer and the mobile phone. Subscribers to the Foxtel service can access a variety of channels with selected content, mainly films, available on an on-demand or near on-demand basis. Foxtel has also made some of its broadcast content available through its website to its subscribers on a time-limited basis. Foxtel offers a Mobile Foxtel service for Telstra mobiles. A selection of content from various Foxtel channels, including news, entertainment and sports, is available via the mobile on a subscription basis. Users can sign-up for a period as little as one day. Existing Foxtel subscribers can also use the mobile service and the website to remote record Foxtel programming via their handset, further integrating the three screens.

Internet service providers

Pricing and service provision arrangements in Australia typically impose caps on the amount of data that internet users are able to download (usually measured on a monthly basis). These arrangements are somewhat unique to Australia, with internet service provision in many countries not imposing such limits on the amount of data that consumers can access. These limits may act as inhibitors to the consumption of high bandwidth video content where a consumer may be concerned about the possibility of exceeding the data cap and incurring additional charges or having the broadband service 'shaped' to a slower data rate until the end of the monthly payment period. These concerns may influence consumer preferences for the way that they access content, and for the ability of content service providers to attract consumers to their service.

ISPs which provide content may have a competitive advantage in the provision of IPTV and internet video services, as they could offer specific content to their customers on an unmetered basis, whereas customers of non-ISP content providers will need to consider the impact of consuming content within their current broadband plans.

Recent market offerings by ISPs do appear to be addressing these issues, with the size of data caps continuing to increase to accommodate consumer demand for broadband plans, providing data caps large enough to better accommodate the consumption of large amounts of video content. For example, TPG now provides plans with download limits as high as 500 Gigabytes, a volume that would seem to enable most households to download or stream a significant amount of audio/video content.

For internet service providers, content delivery over IP offers a way to differentiate their services and positively impact on customer retention and acquisition. Depending upon consumer take-up of the service and its mode of delivery, content delivery over IP may also be a new revenue source for ISPs and content service providers. Models offered by ISPs include:

> IPTV, which exploits their ability to manage their IP network

> offering website content

> offering set-top boxes

> forming partnerships with other content providers that allow ISP customers to access content on an unmetered basis.[38]

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[37] Information sourced from Foxtel website, accessed 1 April 2010, www.foxtel.com.au.

[38] Unmetered downloads allow internet users to download files without it impacting their monthly download limit.

Internationally, many major ISPs, such as BT in the United Kingdom, AT&T in the United States, PCCW in Hong Kong, and MTS in Canada, have introduced IPTV services utilising a variety of business models. The launch and take-up of an IPTV service is dependent upon a range of country-specific factors including the level of subscription television competition, broadband penetration and network capability, the commercial environment for ISPs, and the availability of premium content.[39]

TPG offers a trial IPTV-to-the-PC service and TransACT has an IPTV service delivering more than 50 channels to customers on its Fibre-to-the-premises (FTTP) network.[40] TPG is offering an IPTV service to its customers on selected IPTV-enabled exchanges at no charge, with more channels promised soon.[41] The channel line-up of the TPG service has not changed substantially since 2008 and consists mainly of foreign-language channels. TransACT offers subscription-TV like services, TransTV, to limited areas in Canberra and Victoria. TransACT offers the FTA channels, selected channels shown on services like Foxtel, such as National Geographic, BBC World News and Disney, as well as on-demand content including sports and adult-only content.[42] In late May 2010 TransAct launched an IPTV service bundling subscription television with a set-top box and a broadband subscription.[43]

Currently, ISP content services in Australia are mostly restricted to offering unmetered downloads. For example, iiNet's website, 'Freezone,' lists the sites that iiNet customers can download unmetered content from, such as iTunes, ABC iView and TiVo, as well as free video content housed on the ISP's website.[44] Internode offers unmetered entertainment for a variety of services including ABC's iView and TiVo.[45] Telstra has launched its T-box service in June 2010, a set-top box that is a personal video recorder, provides high definition free-to-air television, on-demand movie downloads and access to seven sports, news and music channels. There are no subscription fees to access the content (except on-demand movies are charged), and customers will be able to pay for the T-box outright or in instalments over 24 months.[46] It is understood that content provided over the T-box is unmetered to customers (and also only available to eligible Telstra BigPond internet service customers). The BigPond Movies website provides full-length films and television programs for download on a PPV basis for those users not utilising the T-box service.[47]

After a period of relative inactivity, albeit punctuated by iiNet and Internode announcements of early plans to launch IPTV in the future,[48] there have been more concrete developments in the provision of IPTV services. iiNet commenced a trial of the FetchTV IPTV service in April 2010, with intentions announced to launch the

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[39] For further discussion of these issues, refer to the 2008 ACMA report, *IPTV and Internet video in Australia*, pages 20–23.

[40] TransACT states that it delivers TV over DSL services to the areas covered by its FTTN/VDSL network and IPTV services to those suburbs covered by its Fibre to the Premises (FTTP) network. This report includes all of TransACT's TransTV services under the umbrella of IPTV services for the purposes of analysing the IPTV sector in Australia.

[41] TPG website, accessed 31 March 2010, www.tpg.com.au/iptv.

[42] TransACT website, accessed 31 March 2010, www.transact.com.au/television/default.aspx.

[43] The Australian Newspaper, *TransACT first with net TV package*, 31 May 2010.

[44] iiNet website, accessed 23 March 2010, www.iinet.net.au/freezone.

[45] Internode website, accessed 31 March 2010, www.internode.on.net/residential/entertainment.

[46] Telstra, *Telstra T-Box brings BigPond TV, internet entertainment and on-demand movies to Aussie TVs*, media release, 1 June 2010.

[47] BigPond Movies website, accessed 31 March 2010, http://bigpondmovies.com/?ref=Net-Head-Movies.

[48] iiNet , *200,000 customers on iiNet's National Broadband Network Promise of IPTV in 2009*, media releases, 24 November 2008 and Andrew Hendry, *Internode gets new CEO, preps IPTV services*, *TechWorld*, 18 August 2008, accessed 10 November 2009, www.techworld.com.au/article/257442/internode_gets_new_ceo_preps_iptv_services?fp=4&fpid=21.

service in the first half of 2010.[49] Ericsson Australia Pty. Ltd, (Ericsson) has opened a new facility in Melbourne that will act as a hub for IPTV, broadband TV and mobile TV development.[50]

Table 5 outlines selected IP content offerings by ISPs in Australia.

Table 5 Selected IP content offerings of Australian ISPs

Company	Primary service	Service	Content	Revenue model
Telstra	Communications	BigPond Movies/TV website and T-box set-top box	TV and film content of local and international origin. Mix of recent and archive content. T-box will consist of a personal video recorder providing access to FTA television, seven BigPond TV channels including sports, news and music, and a library of on-demand movies.	PPV
iiNet	ISP	Partnership with FetchTV. Service trials commenced April 2010.	Partnering with content aggregator FetchTV. Trials commenced April 2010, service expected to launch mid-2010. Will offer mix of on-demand content and subscription channels.[51]	Subscription and PPV
TPG	ISP	IPTV to the computer	Small selection of content channels, mainly foreign language	No charge
TransACT	Communications	IPTV to the TV	Pay TV channels and on-demand content	Subscription and PPV for on-demand content

Note: This is not an exhaustive list but an overview of major IP content offerings from Australian ISPs.
Source: ISP websites

Mobile service providers

The delivery of content over IP offers new revenue sources for mobile operators as well as an additional way to attract and retain customers. All Australian mobile service providers offer some form of video, both on demand and streamed through channels. All of this content is offered over the operators' 3G networks; there is no mobile broadcast network currently operating at a commercial level in Australia. Mobile broadcast networks, using a variety of technologies including DVB-H, have been launched in Europe, Asia, and the United States.[52]

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[49] *iiNet to launch FetchTV as IPTV service 'soon'*, Exchange Daily, 13 April 2010.

[50] Luke Coleman, *Ericsson opens regional TV centre in Melbourne*, Communications Day, 10 November 2009, pages 2–3.

[51] iiNet, *Australian First: iiNet set to play FetchTV*, media release, 12 April 2010.

[52] Eden Zoller, *Taking the temperature of mobile TV*, Ovum, 2009.

Table 6 outlines selected IP content offerings by mobile service providers in Australia. It is noted that mobile users can also access mobile video from other independent sources, such as iTunes Australia and the Australian broadcaster ABC.

Table 6 Selected IP content offerings of Australian mobile providers

Company	Primary service	Service	Content	Revenue models
Telstra	Communications	Mobile video	Variety of local and international television programs. A mix of clips and television episode split into clips is offered.*	Subscription or PPV
Optus	Communications	Mobile video	TV content, both international and domestic in origin available on-demand	Subscription or PPV
VHA (Vodafone)	Mobile communications	Mobile video	TV content, both international and domestic in origin available on-demand	Subscription or PPV
VHA (Three)	Mobile communications	Mobile video	TV content, both international and domestic in origin, available on-demand	Subscription or PPV

Telstra mobile also offers Mobile Foxtel which is detailed in Table 2. (Source: Mobile operator websites)

New entrants

For new entrants, content distribution over IP offers new revenue sources and potentially new customers who will purchase their other products. For example, Apple's iTunes application supports the sale of its iPhone, Apple TV, and iPod. Industries, such as computer hardware manufacturing, that previously had no involvement with content producers, are increasingly offering commercially developed content to consumers. Examples include the film download services offered by Microsoft Xbox 360 and Sony PlayStation 3 in Australia and the online retailer Amazon's video-on-demand service in the United States. Foxtel has announced a partnership with Microsoft to make Foxtel subscription television accessible over the internet and direct to television sets through the Xbox 360 online service Xbox Live late in 2010.[53] Television manufacturers such as LG and Sony are now selling internet-capable television sets, which connect to the internet and provide access to video content directly through the television set, without the need for a set-top box or a PC. In addition, industries involved in the distribution of content such as DVD and video rental are moving into content distribution over the internet. One example is Netflix, a DVD rental service delivered by post in the United States, which has moved into online content delivery. Selected examples operating in Australia are shown in Table 7.

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[53] Foxtel, *Foxtel and Microsoft Sign Ground-breaking Xbox Agreement*, media release, 20 May 2010

Table 7 Selected IP content offerings of new entrants operating in Australia

Company	Industry	Service	Content	Revenue models
Apple	Computing	iTunes Australia	Mainstream film and TV content. Content is fairly recent and the majority is of international origin.	PPV
Microsoft	Computing	Xbox 360	Offers recent film content for streaming or download.	PPV
Hybrid Television Services (ANZ) Pty Limited	Set-top box retail*	TiVo set-top box	TiVo users can access film and television programs on-demand. The content is a mix of fairly new and archive content and the majority is international in origin.	PPV
Sony	Television manufacturer** / games console manufacturer	Sony BRAVIA TV	Internet-ready television. Offers access to catch-up television from SBS, Plus7, ABC iView as well as other internet video content. PlayStation 3 and PlayStation Portable provide movies on demand.	No charge (advertising supported)
FetchTV (expected to launch mid-2010)	Subscription Television Wholesale	FetchTV	Subscription television channels providing linear programming, video on demand for movies and popular content, free-to-air channels included.	Subscription

The Seven Network owns the rights to distribute TiVo in Australia.
**Sony also has entertainment interests. In this context, however, they are a new entrant to content delivery in Australia.*
Source: Service websites

New entrants in the content industry seem to have garnered a significant portion of the commercially developed content internet video market internationally. In terms of online film, iTunes has 87 per cent of the retail market as shown in Table 8.

Table 8 US online film market 2008

	Retail	Rental
iTunes (Apple)	87%	53%
Xbox Live Video Marketplace (Microsoft)	N/A	33%
Other	13%	14%

Source: Movie download market fragments, Screen Digest, February 2009
Note: This refers to film only, no other content such as television programs.

Revenue models

There are varied revenue models for the delivery of content over IP, the deployment of which depends on the motivations for launching the services and the resources available to the providers.

No charge (no advertising)

In this model, the consumer can view the content at no charge and there is no advertising. This model can be used for video clips, both commercially developed and user-generated. It is also used by government-funded broadcasters, such as ABC iView. This model can also be used in some circumstances by commercial FTA broadcasters and content owners as a way to promote their content.

No charge (advertising supported)

Advertising supported revenue models allow the consumer to access content at no charge. Advertising is embedded within the content. This model is used by commercial FTA broadcasters and other website portals offering commercially developed content. Television programs are generally available via catch-up TV from Australian commercial FTA broadcaster websites on an advertising-supported basis. While the OzTAM ratings system does not currently measure catch-up TV audiences, there appears to be a high level of demand for this type of advertising inventory as viewers were assumed to be more engaged than regular television viewers, and the opportunity for advertisers to be the sole advertiser during each ad break.[54]

Subscription

Users pay a fee to access a selection of content over a set time period, ranging from one day to one year. This is the model used by subscription broadcasters for most of their content, but is currently rarely used for internet video content services. Subscription broadcasters may also receive revenue through advertising.

PPV

Users pay for each individual piece of content as they consume it. This revenue model is generally used for high-value content, both in terms of subscription broadcasting and internet video. iTunes Australia and BigPond Movies offer films and television programs on a PPV basis.

The success of these models, in terms of revenue and consumer take-up, depends upon several factors including consumers' willingness to pay and the desirability of the content for viewers.

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[54] The Australian Newspaper, *Ninemsn gets in on the act with rush to play catch-up*, March 22, 2010.

Commercial environment

Overview

There are many aspects of the Australian commercial environment that impact and influence the development of business models for the delivery of content over IP. This section discusses these influences as they relate to the Australian media and communications environment.

Content

Supply/value chain

The content supply chain is made up of content production, aggregation, management and distribution to consumers. Figure 4 shows the basic steps in the content supply chain.

Figure 4 Content supply chain overview with examples of relevant providers
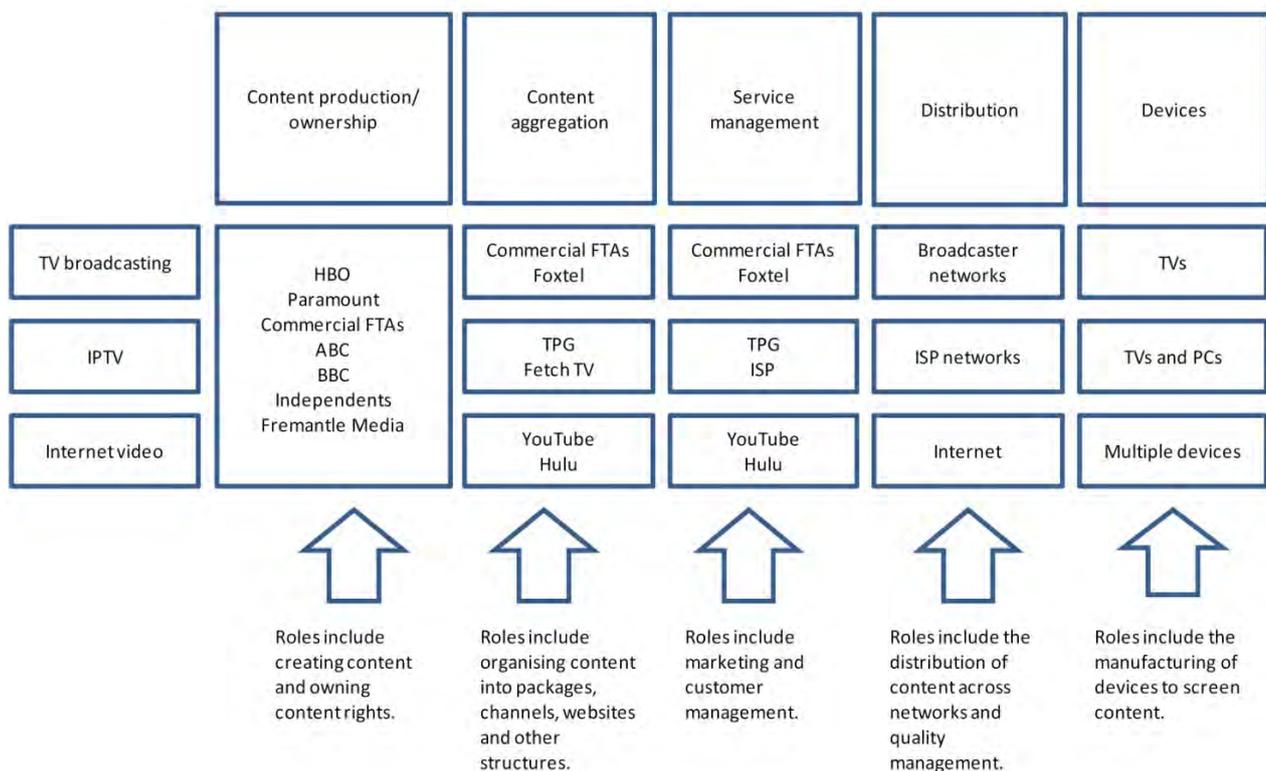
Adapted from: Annelise Brendt, IPTV Services Supply Chain, Ovum, 2007. Additional analysis of service providers undertaken by the ACMA.

The first step in the supply chain is the production of the content. This content is then aggregated into packages, channels, websites or other forms of organisational structure. For example, the Nine network produces content and purchases the broadcasting rights to content that are then organised to make up the Nine network broadcasting channels (9, 9 HD and Go!). The service showing the content is then marketed to potential customers. There are also varying levels of customer management required depending on the revenue models chosen. For example, a subscription television service will need to sign up customers and manage its

subscriptions. The content is then distributed across the networks, either broadcasting or IP-based. Devices, traditionally the television, are then used to access the content. Operators are not restricted to one role in the supply chain. For example Foxtel has some involvement in all steps of the supply chain. Foxtel commissions content, aggregates channels into packages, manages its subscribers' retail interaction, distributes the content over its subscription and satellite network and provides the set-top box with which subscribers are able to view the content on their televisions.

Content supply chain roles and content delivery over IP

The content supply chain outlines the roles that support the distribution of content. Operators can exploit their supply chain assets, such as network or content ownership, to provide a content distribution over IP service. For example, an ISP may choose to use their network access to support an IPTV service, which would be more difficult for a non-network owner to provide, given the network management services required by an IPTV service. The role an operator holds in the value chain is therefore likely to influence the business model they favour for content distribution over IP. For example, a commercial FTA broadcaster, which has no ties to an ISP or hardware manufacturer, may choose to provide content over a website as this avoids the need to partner with network owners or hardware manufacturers, with the revenue sharing this would be likely to entail.

Content availability

An essential part of content distribution over IP is access to content rights. A service will have more difficulty in succeeding without compelling content for potential customers. While non-network owners can use the open internet to deliver content, there is no substitute for access to content. There are several potential barriers to content access: exclusivity, size of the access seeker and customer base, and competing services. High-value content, such as new release films, held on an exclusive basis by one operator, may be a barrier for new entrants to content distribution attempting to provide compelling content on their services.

The importance of the barrier would depend upon the amount of high-value content held exclusively and the business strategies employed. For example, a provider seeking to offer a cheap service based on niche content would be unlikely to be interested in distribution rights of more expensive high-value content.

Sport is a highly attractive content source for broadcasters and other content providers. The Department of Broadband, Communications and the Digital Economy (the DBCDE) is reviewing the anti-siphoning regulatory regime which prevents subscription broadcasters from purchasing the television rights to events on the anti-siphoning list before FTA broadcasters have had an opportunity to do so. This incorporates a consideration of new media platforms, such as IPTV and internet video.[55]

As discussed in the 2008 ACMA report, *IPTV and Internet video in Australia*, content owners are anxious to maximise their audience reach and so are more interested in dealing with larger companies than smaller operators. This has particular relevance in Australia where there is a large number of ISPs with a small customer base. Of the 104 ISPs with more than 1,000 customers, 65 (or 62.5 per cent) have 10,000 or less subscribers.[56] Content aggregators can assist in this issue by using their own size and expertise to procure content at reasonable rates and then wholesaling the content to

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[55] DBCDE, *Sport on television: A review of the anti-siphoning scheme in the contemporary digital environment*, Discussion paper, August 2009, pages 4–5 and 22–24.

[56] ABS website, *8153.0 Internet Activity Survey*, December 2009, accessed 1 April 2010, www.abs.gov.au/ausstats/abs@.nsf/mf/8153.0

smaller operators at prices smaller ISPs could not achieve on their own. FetchTV is one example of such an aggregator.

FetchTV- content aggregator for ISPs.

FetchTV has announced plans to supply its content product that it will wholesale to ISPs in Australia to then onsell to their customers. Content is supplied over closed networks to local exchanges and then into individual premises, and appears to meet the definition of IPTV used in this report. iiNet has partnered with FetchTV, with service trials commenced in April 2010.[57] No other partners have been announced as yet, though Internode has confirmed it is in talks with FetchTV.[58] Content will be a mix of subscription channels and on-demand content, including films, television programs, documentaries and children's shows. New-release films will be shown on a PPV basis. The FetchTV service will also include 3D TV capability, gaming, and social networking functions.[59]

FTA and subscription broadcasters experimenting with their own distribution methods over IP may be reluctant to offer their content to other distributors. In the United States, Viacom has removed two of its television shows, *The Daily Show* and *The Colbert Report* from the online video website Hulu. Clips from the shows will only be available from the two shows' individual websites. While the clips are shareable they will be embedded in the Comedy Central video player, ensuring the advertising revenue remains with Viacom.[60] This example of content owners choosing to use their own distribution methods on the internet, rather than partnering with other operators, shows the potential barriers to content access for some high value content.

International restrictions

Typically, the availability of commercially-developed content, such as television programs, is legally restricted to the country of origin and those international operators that have agreements with the content owners to distribute it in other countries. This means that internet video sites such as the United States-based website Hulu, which offers television programs from broadcasters such as NBC and Fox, is only available to internet users with a US IP address. Consequently, the Australian internet video environment is restricted to that offered by operators providing content available to Australian audiences.

Entities offering content over IP in Australia will need to have IP distribution rights to the content in order to offer it through their services. The large growth in Australia over the past year in the proportion of US shows on commercial FTA broadcaster catch-up TV sites in Australia, such as *Greys Anatomy* and *Heroes* (although not at the same level of quantity and diversity as US-based sites like Hulu), suggests that IP delivery of content in Australia may be increasingly contestable between existing rights holders and new market entrants.

Piracy

While pirated material is not a focus of this report, it is an influence on the commercial environment in which content is delivered. Piracy is a potential hindrance to the growth of IPTV and internet video services in Australia. As consumers can access free content, and international content that may not yet be available in Australia via P2P networks like BitTorrent, they may be less interested in accessing content through legal channels, particularly if they have to pay.

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[57] *iiNet to launch FetchTV as IPTV service 'soon'*, Exchange Daily, 13 April 2010.

[58] Lara Sinclair, *Fetch locks in ISP partners for new pay-TV*, The Australian, 24 November 2009

[59] iiNet, *Australian First: iiNet gets set to play FetchTV*, media release, 12 April 2010.

[60] *Hulu, Colbert, and the Recentralization of Video on the Web*, TechCrunch, 3 March 2010.

The threat of piracy has motivated commercial FTA broadcasters to reduce distribution lag with international content. The Seven Network is considering airing television programs of US origin at the same time as they are screened in the United States in order to combat piracy. There is traditionally a gap between US and Australian television broadcast of anywhere between a few days to over a year.[61]

Infrastructure

National Broadband Network (NBN)

The Australia Government has established a new company, NBN Co Limited, to build and operate a new National Broadband Network, investing up to $43 billion over eight years to fund the rollout and ongoing operations of the network. The network objective is to connect 90 per cent of homes, schools and workplaces with fibre-to-the-premises infrastructure capable of providing broadband services with speeds of 100 Mbit/s. The remaining premises are expected to be connected with next generation wireless and satellite technologies that will be able to deliver 12 Mbit/s or more to people living in more remote parts of Australia. The rollout of the NBN is expected to take 8 years with the exact rollout strategy to be determined.[62]

Among other services, such as education and health, the NBN will be able to support the provision of IPTV and high-quality internet video. It is also expected that this network will encourage growth in the provision and take-up of these entertainment services.

Convergence of functions

Australian ISPs, mobile service providers, and new entrants to the communications and media sectors have experimented with, and are offering, content distribution services. Service access providers are becoming content distributors. While once the fixed-line service provider only offered voice services, an organisation such as Telstra can now offer internet, fixed line, mobile and content services. The development of the communications and media industries will be heavily influenced by the increasing merging of voice, internet, and content delivery functions over time. The services will be further entwined as the roles of hardware production, communications access and content distribution combine.

Download limits

In addition to the payment model for the actual content, internet and mobile users must also consider the effect of downloading a film or television program on their monthly download limit. Internet access plans often include monthly download limits of anywhere between 200 MB to 25 GB and above. After the download limit has been reached, further downloads are charged per MB, or the internet connection is 'shaped' to dial-up or entry-level broadband speeds.[63]

The impact of the download limits on consumer behaviour varies widely depending upon the size of the monthly limit. For example, assuming a movie download size of 1.5 GB, a user on a 200 MB monthly allowance would be unable to download the

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[61] Darren Pauli, *Seven Network mulls scrapping content screening delays*, Computerworld, 10 February 2010, accessed 23 March 2010,
www.computerworld.com.au/article/335739/seven_network_mulls_scrapping_content_screening_delays/.

[62] The Department of Broadband, Communications and the Digital Economy (DBCDE), *New National Broadband Network*, media release, 7 April 2009.

[63] 'Shaped' or 'shaping' is the term used to describe the slowing of a connection to a consumer once they have exceeded their monthly download quota. For example a customer on a 24Mbit/s connection may have their connection shaped down to 256kbit/s for the remainder of the month in which they have exceed their quota.

movie without going over the users' download limit. A user on a 25 GB allowance could comfortably download 16 movies and stay within the monthly limit.

Some internet content sites have partnered with ISPs to incorporate these download restrictions as part of their business model. For example, ABC content is available as unmetered downloads to iiNet and Internode users.[64]

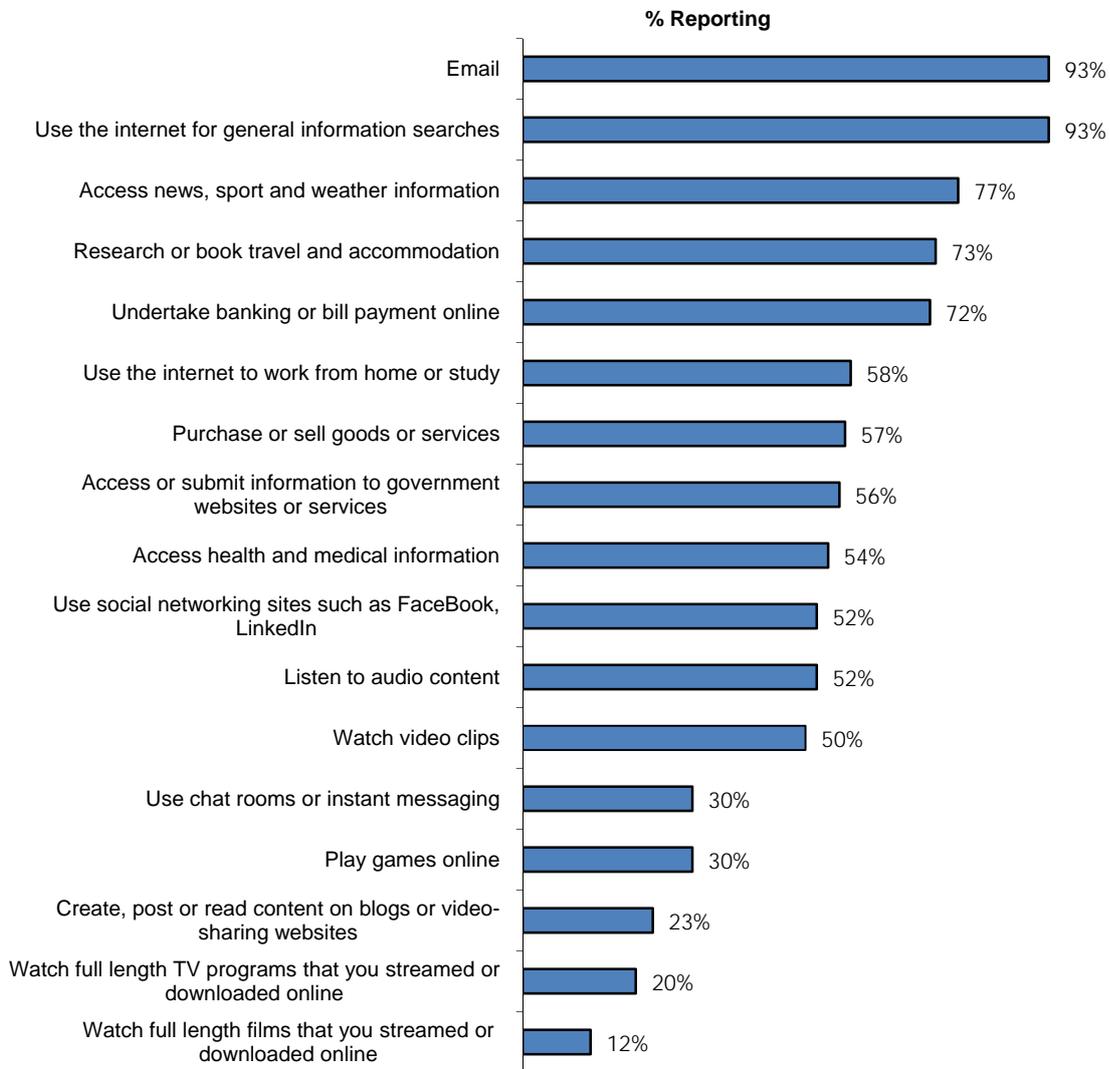# Consumers

Internet video behaviour

While IP content supply models are clearly increasing in Australia, it is also important to consider consumer interest in these services as they will affect development of the content distribution industry.

There is currently a small proportion of consumers in Australia watching television and film online. An ACMA 2009 survey found that 20 per cent of respondents had watched television online in the last six months and 12 per cent had watched full-length films (Figure 5).

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[64] Unmetered downloads allow internet users to download files without it impacting their monthly download limit.

Figure 5 Online activities

% Reporting

Activity	%
Email	93%
Use the internet for general information searches	93%
Access news, sport and weather information	77%
Research or book travel and accommodation	73%
Undertake banking or bill payment online	72%
Use the internet to work from home or study	58%
Purchase or sell goods or services	57%
Access or submit information to government websites or services	56%
Access health and medical information	54%
Use social networking sites such as FaceBook, LinkedIn	52%
Listen to audio content	52%
Watch video clips	50%
Use chat rooms or instant messaging	30%
Play games online	30%
Create, post or read content on blogs or video-sharing websites	23%
Watch full length TV programs that you streamed or downloaded online	20%
Watch full length films that you streamed or downloaded online	12%

Source: ACMA Consumer Survey 2009, n=1315

YouTube, which in Australia only offers short clips of both commercially developed and user-generated content to viewers, had by far the largest audience in terms of video websites tracked by Nielsen Netview for the month of February 2010. Sites offering full length video content such as ABC iView, while dwarfed by YouTube in terms of traffic, still have a developing audience base, as shown in Table 9.

Table 9 Selected Australian video website audiences for the month of February 2010

Site	Content	Unique audience (000s)
YouTube (Australia)	User Generated Content (UGC) and clips	4,221
ninemsn video	UGC, commercially developed content and clips	327
BigPond movies	Commercially developed content on a PPV basis	261
Plus7	Catch-up television content	125
ABC iView	Commercially developed content	120+ (est.)
BigPond TV	Commercially developed content and clips	102
iTunes (Australia)	Music and commercially developed content downloads	2,796*

This includes music and video downloads
Source: Nielsen Online, Netview Home Panel, February 2010. Figure with (est.) is an ACMA estimate.

Mobile behaviour

Despite the many video services available for mobiles in Australia, mobile internet video activity on a regular basis has been quite low. Eighty-one per cent of Australian mobile phone users surveyed by Ovum, had never viewed mobile video. Only six per cent had watched video on their mobile one or more times a week.[65]

Future directions

The increasing ability of consumers to choose when, where and how they consume content will encourage the fragmentation of audiences. Users will increasingly choose their own time for content consumption on their own preferred device rather than consume television content at the appointed time. This can be seen in the increasing, although still small, proportion of consumers who watch video on their PC, and the potential for consumers to seek content at anytime from their television set (given the recent developments discussed throughout this report).

Figure 6 shows the growth in PC video viewing.

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[65] Michele McKenzie, *Video trends: the mobile story*, © Ovum, 2009.

Figure 6 Average weekly watching hours for TV and PC video, 2007 and 2008
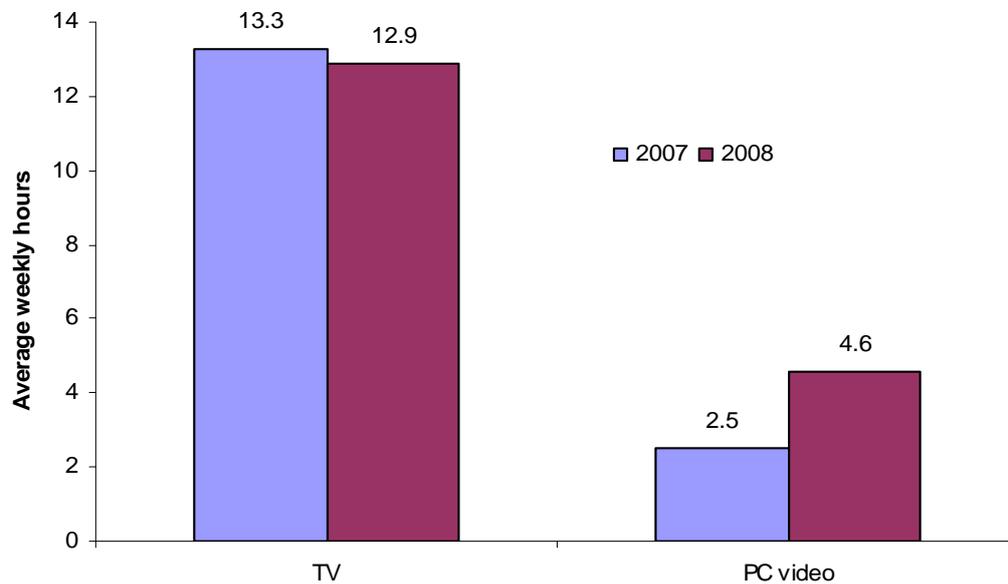
Source: Nielsen Online, The Australian Internet and Technology Report, 2008–2009, February 2009.
Note: Data is sourced from a small base.

The proliferation of different ways to access content available to consumers is creating a different environment for the distribution of content. The increasing expectation of consumers that they will be able to access content when and where they want will be an important influence on the development of content distribution in Australia. Business models of content owners and distributors will need to modify and adapt to changing consumer behaviour.

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