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The Emergence of Wireless Broadband in Australia

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Peter Mulligan looks at wireless broadband in Australia and its regulation

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roadband in Australia is beginning to ake-off at last. The latest figures from ne Australian Competition and Con-umer Commission (**ACCC**) show that s at December 2004 total broadband ake-up was 1.5 million subscribers, vhich is more than double the number rom a year earlier.[1]

he Federal Government is working ard to drive the roll out and take-up of roadband in Australia. The National roadband Strategy was launched in 004 with a vision that:

> *"Australia will be a world leader in the availability and effective use of broadband, to deliver enhanced outcomes in health, education, community, commerce and government to capture the economic and social benefits of broadband connectivity".*[2]

he Government has now also released ne National Broadband Strategy Action lan which outlines more than $300 mil-on in Federal initiatives to encourage ne roll out of broadband infrastruc-ure[3]. This is in addition to the Higher andwidth Incentive Scheme (**HiBIS**) vhich is a Federal program aimed at rovíding access to higher bandwidth ervices for people in regional, rural nd remote Australia at prices compa-able to those available in metropolitan reas.

roadband services can be provided sing a variety of fixed-line and wire-ss technologies. These include xDSL echnology (which uses existing Telstra opper pairs), fibre-optic cable, hybrid fibre-optic/co-axial cable (**HFC**) and digital wideband radiofrequency technology (used by third generation (**3G**) telephony systems). ADSL is currently the most popular form of broadband access for Australians[4].

This paper focuses on the wireless technologies employed to provide broadband services in Australia and examines the regulatory issues which impact on providers of wireless broadband services.

What is Broadband?

Broadband means different things to different people. In general terms, it describes the capacity to transmit large quantities of information quickly over a communications network. It is a reference to capacity rather than the form (analogue or digital) in which or the means by which information is transmitted[5].

For reporting purposes, the ACCC defines broadband as any high speed connection providing more than 200kbit/sec over a mix of media. This definition excludes PSTN dial-up connections that run at 56 kbit/sec and ISDN dial-up connections which run at either 64 or 128 kbit/sec[6].

Broadband enables the provision of rich multimedia services and greater volumes of data to subscribers. The deployment of always-on, high-speed internet access has the potential to spur the information economy in areas as diverse as business, healthcare, education and research[7].

The Rise of Wireless Broadband

Wireless broadband is simply a broadband internet service provided over a wireless connection. It can be provided from a number of bands of the radio-frequency spectrum and using various wireless technologies. Examples include the 2.4GHz, 5.2GHz and 5.8GHz class-licensed bands for wireless fidelity (or 'WiFi') services, 3G telephony systems which use wideband digital radio technology and Telstra's Mobile Broadband service which uses Ev-DO (evolution-data optimized) technology from Nortel.

Some of the benefits of wireless broadband for the provider are the relatively low cost of establishing a network (compared with rolling out a new cable network) and the speed with which it can be deployed. For the customer, the service is simple to set up and in many cases allows the customer to change locations without having to reconnect. It has the potential to provide higher data rates over greater distances than DSL or cable technologies[8].

Wireless systems are a viable alternative to Telstra's copper pairs for last mile access to the internet. They are attractive to city-based consumers who cannot access DSL or cable broadband and professionals who spend a lot of time on the road or work outside of business hours. They have great potential for rural and regional areas where the cost of deploying new fixed line services is prohibitive.

Technologies and Standards

A number of different technologies and standards have emerged for the delivery of wireless broadband services. They include WiFi and WiMAX (Worldwide Interoperability for Microwave Access). WiFi is a local area service while WiMAX is a wide area service.

The Institute of Electrical and Electronic Engineers (**IEEE**) is the US standards-making body responsible for the development of standards for WiFi and WiMAX. WiFi generally refers to the IEEE 802.11 series of standards covering wireless short-range communications equipment. WiMAX refers to the 802.16 series of standards currently being finalised by the IEEE[9].

Short-range or local area services are generally provided using equipment that complies with the 802.11 series of standards. This includes 802.11a in the 5.2GHz and 5.8GHz bands and 802.11b & g in the 2.4GHz band.

The 802.11 standards support the transmission of information by radio signals from a laptop computer (using a network access card or embedded chip) to a nearby access point. This enables users to access the internet within a dwelling, a wireless local area network (WLAN) of a business or a WiFi 'hotspot'. Network coverage of up to 100 metres from a base station is often available.

WiFi hotspots have been installed in locations such as cafes, airport lounges, restaurants, shopping centres and university campuses. Some hotspots provide free access to the internet while others charge a time-based fee. Examples of wireless services include SkyNetGlobal's wireless hotspots service, BigAir's wireless broadband service, the 'Telstra Wireless Hotspots' service and the 'Optus Wireless Connect' service.

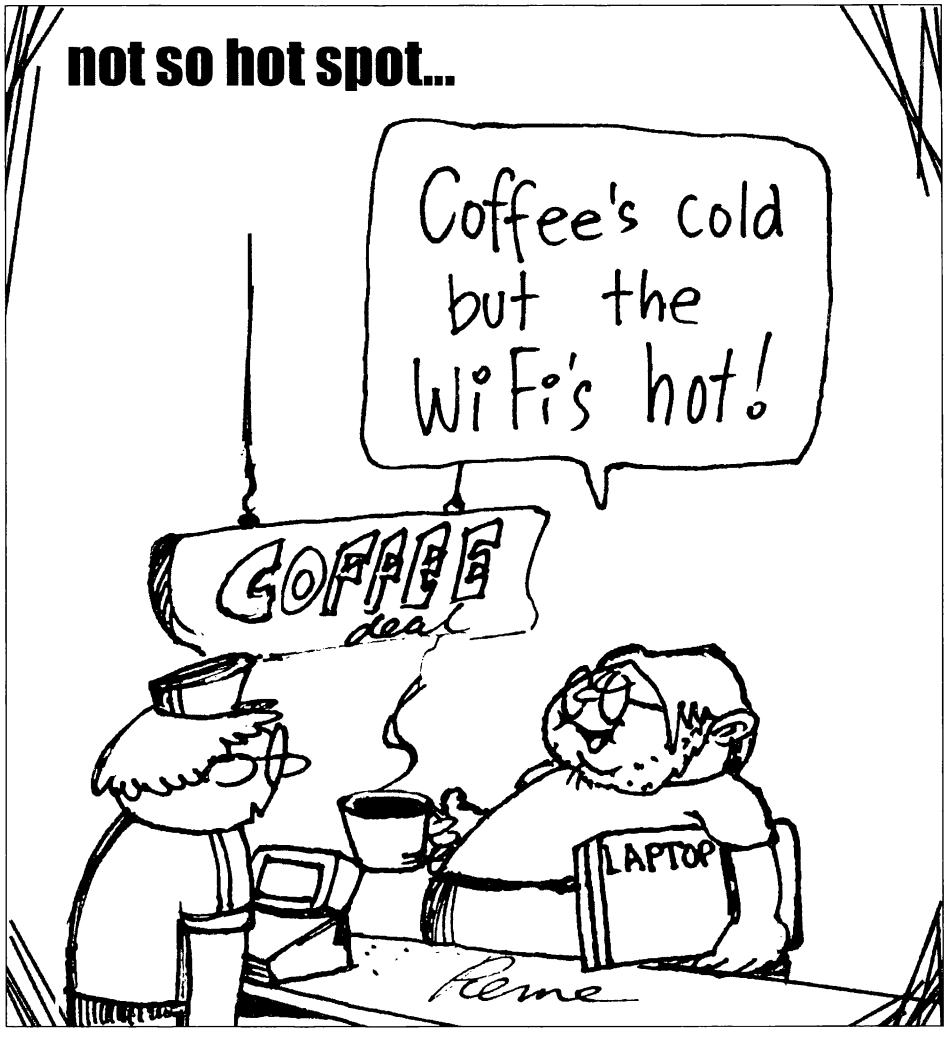
When released, the 802.16e version of WiMAX will be a significant improvement upon WiFi. It will extend coverage over longer distances and at higher speeds, enabling subscribers to access the internet up to about 50 kilometres from a base station[10]. With a range such

as this, WiMAX will be an attractive solution for sparsely populated areas such as rural and regional Australia.

Two new means of obtaining wireless broadband access are through the services provided by Unwired and Personal Broadband Australia, respectively. Unwired provides wireless broadband using spectrum licences in the 3.4-3.5GHz band of the radiofrequency spectrum. To access the service, the user installs a USB or ethernet modem into a laptop. At this stage, this service is intended for stationary users only.

Personal Broadband Australia provides wireless broadband using spectrum licences in the 2.1GHz band of the radiofrequency spectrum. This is the same frequency as that employed for 3G mobile phones. It uses iBurst technology from Arraycomm to provide internet access to users that are either stationary or mobile. To access the service, the user installs an insertable PC card or a portable modem into a laptop.

Compared to WiFi, the Unwired and iBurst services have the potential to provide better coverage with greater security and quality of service. This makes them a real threat to Telstra's dominance of the local loop.



The Regulatory Regime

The Commonwealth Government has recently stated that it favours a responsive regulatory regime which maximises flexibility in the development and application of broadband supporting technologies[11]. However, some have argued that the rapid emergence of wireless broadband presents challenges for regulators, especially in meeting the demand for new spectrum[12].

Wireless broadband is affected by two discrete but related regulatory regimes: the *Radiocommunications Act 1992* (**Radiocommunications Act**), which regulates access to and use of the radiofrequency spectrum and the *Telecommunications Act 1997* (**Telecommunications Act**), which regulates the provision of telecommunications services.

The Radiocommunications Act

In general terms, the Radiocommunications Act prohibits the operation of radiocommunications equipment without a licence. The types of licences that are mandated are spectrum licences, apparatus licences and class licences. Class licences and apparatus licences authorise the operation of radiocommunications equipment, while spectrum licences authorise the use of spectrum space.

Class licences

The operation of WiFi equipment is authorised by a class licence under the Radiocommunications Act. Class licences are a form of licence that do not have to be applied for, and no licence fees are payable. They are open, standing authorities allowing anyone to operate particular radiocommunications equipment, provided that the service and the device satisfy the relevant licence conditions[13].

The class licence system is considered to be the radiocommunications equivalent of a 'public park'. All users operate in the same band and are subject to the same limits. Users compete to access the same spectrum and this often results in interference between users and with other devices.

As an example, users of 802.11b equipment share the same spectrum with equipment such as household microwave ovens, cordless phones, barcode readers, biomedical telemetry, video surveillance and other devices in the industrial, scientific and medical (ISM) band[14]. The potential for interference is obvious.

Class licences are regulated under Part 3.4 of the Radiocommunications Act. The Australian Communications Authority (**ACA**) issues, imposes conditions, varies and revokes class licences by way of a notice published in the Commonwealth Gazette.

The relevant class licences for the operation of WiFi equipment are the *Radiocommunications (Spread Spectrum Devices) Class Licence 2002* (**SSD licence**) and the *Radiocommunications (Low Interference Potential Devices) Class Licence 2000* (**LIPD licence**). The SSD licence specifies conditions of operation for short-range devices using spread spectrum techniques.

This includes 802.11b technology in the 2.4GHz band. The LIPD licence authorises the operation of a wide range of low power radiocommunications devices in various segments of the radiofrequency spectrum. This includes the 802.11a and 802.11g technologies in the 2.4GHz, 5.2GHz and 5.8GHz bands.

Spectrum licences

In Australia, the roll out of wide-coverage wireless broadband is being pioneered by Unwired and Personal Broadband Australia. Both companies use spectrum licences to provide services in Sydney. Personal Broadband Australia also provides its iBurst service in Brisbane, Gold Coast, Canberra and Melbourne.

Spectrum licences are regulated under Part 3.2 of the Radiocommunications Act. They authorise the use of a band of the radiofrequency spectrum over a specified geographical area. Licences are a tradeable, technology neutral spectrum access right for a fixed non-renewable term.

Spectrum licences are issued for a term of up to 15 years and are not limited to any particular technology, system or service. Licensees are free to use any device from a site within the licence boundaries, provided that the device complies with the core conditions of the licence and the technical framework for the bands.

The Telecommunications Act

The telecommunications regulatory regime in Australia is predicated on technological neutrality. This means that the regulatory focus is on the service provided rather than the technology used or provider of the service[15].

In general terms, the Telecommunications Act requires that the owner of a 'network unit' must have a carrier licence or nominated carrier declaration in place if they supply a carriage service to the public[16]. This is intended to apply irrespective of whether the service is provided by wire, optical fibre, satellite or radio system[17].

The definition of 'network unit' includes a 'designated radiocommunications facility'. This will ordinarily include radiocommunications equipment used to supply a wireless broadband service[18]. As a result, the owner of such equipment must obtain a carrier licence unless an exception applies.

The main exceptions to the requirement to obtain a carrier licence are where:

(a) the owner obtains a nominated carrier declaration in respect of its supply of carriage services to the public;

(b) the radiocommunications equipment is not used to supply a carriage service to the public; or

(c) the service is covered by the exemption for WiFi hotspots.

"It has the potential to provide higher data rates over greater distances than DSL or cable technologies"

These are discussed in more detail below.

Nominated carrier declarations

A nominated carrier declaration permits the owner of a network unit to nominate a carrier to supply carriage services over the network unit to the public. Division 4 of Part 3 of the Telecommunications Act regulates the granting of nominated carrier declarations.

A nominated carrier declaration is most likely to be used in one of two circumstances: first, by owner operators of network units which are not ordinarily in the business of providing carriage services (such as the networks of tertiary institutions) and secondly, in respect of owners with a passive investment in network units, such as institutional investors or financiers[19].

The effect of a nominated carrier declaration is that a third party agrees to accept the carrier-related responsibilities and become the 'nominated carrier' for the network unit. This relieves the owner of the requirement to obtain a carrier licence and comply with the carrier obligations in the Telecommunications Act.

Supply to the Public

A carrier licence will not be required if there is no supply of carriage services to the public. Section 44 of the Telecommunications Act defines 'supply to the public' by reference to the 'immediate circle' of the owner of the network unit.

'Immediate circle' is defined in section 23 of the Telecommunications Act to include the employees of an organisation. The effect is that services supplied by organisations over private networks to their employees are not services 'supplied to the public'.

Generally speaking, this means that an organisation that supplies a wireless broadband service to its employees using infrastructure owned by that organisation is not required to obtain a carrier licence. An example is where an organisation sets up a private WLAN.

The exemption for WiFi hotspots

In September 2002 the Minister for Communications, Information Technology and the Arts made a determination under section 51 of the Telecommunications Act entitled *Determination under Subsection 51(1) (No. 1 of 2002)* (**Ministerial Determination**)[20].

The Ministerial Determination provides that wireless networks are exempt from the requirement to obtain a carrier licence where:

(a) the users of the wireless network are not in a 'distinct place' from the wireless network unit; and

(b) a carrier licence would not be required for a fixed line service in the same circumstances.

The definition of 'distinct place' is crucial to the operation of the WiFi hotspots exemption. The term 'distinct place' is defined in Division 4 of Part 2 of the Telecommunications Act. Essentially, distinct places are separate and non-adjoining properties owned or used principally by the same person or persons.

The result is that a carrier licence will not be required for a WiFi hotspot used to provide carriage services to the public where users are in the same place as the WiFi equipment. This ensures

"Although it is early days, the future looks rosy for wireless broadband in Australia"

that WiFi services provided at a single location, such as hotels, airport lounges and internet cafes are exempt[21].

Where no exception applies

The owner of infrastructure used to provide wireless broadband services to the public will have to obtain a carrier licence where none of the above exceptions apply.

In such circumstances, the organisation will have to comply with the carrier licence conditions in Schedule 1 of the Telecommunications Act. This includes a requirement to comply with the *Telecommunications (Consumer Protection and Service Standards) Act 1999* and the regulations under that Act.

Other obligations that apply include the obligations upon carriers relating to:

(a) the payment of licence fees;

(b) compliance with relevant industry codes and standards;

(c) the universal service regime;

(d) the Customer Service Guarantee Standard;

(e) membership of the Telecommunications Industry Ombudsman scheme;

(f) access to emergency call services;

(g) privacy of communications;

(h) the protection of national interests and law enforcement; and

(i) defence requirements and disaster plans.

The Future

Although it is early days, the future looks rosy for wireless broadband in Australia. The rate of take-up of broadband has accelerated over the past year and there is beginning to emerge a critical mass of suppliers active in the wireless sector.

The regulatory regime in Australia is based on technological neutrality and in the case of wireless broadband, this was reaffirmed in 2002 with the release of the Ministerial Determination. Along with the class licensing regime this has facilitated the roll out of WiFi hotspots in Australia and contributed to the growth of the WiFi industry.

Looking into the future, the stage is set for providers of wireless broadband over wide area networks such as Unwired and Personal Broadband Australia. The development of the WiMAX standards will provide further impetus for growth.

This is likely to present a number of significant challenges for regulators in Australia. The evolution of wireless standards and access technologies will lead to convergence of platforms and the need for consistent, technology neutral regulation. Existing regulation will need to be revisited as gaps arise.

Peter Mulligan is a Lawyer at Henry Davis York, Sydney. Robert Neely, a Partner at Henry Davis York, commented on the draft.

(Endnotes)

[1] ACCC, "Snapshot of Broadband Deployment as at 31 December 2004" (2005)

[2] see Department of Communications, Information Technology & the Arts, "Australia's National Broadband Strategy" (2004)

[3] see Department of Communications, Information Technology & the Arts, "National Broadband Strategy Implementation Group- Government Action Plan" (2005); see also Senator Coonan's speech to the 2005 Internet Industry Association Annual Dinner, at www.minister.dcita.gov.au/media/speeches/2005_internet_industry_association_annual_dinner2

[4] ACCC, "Snapshot of Broadband Deployment as at 31 December 2004" (2005)

[5] see House of Representatives Standing Committee on Communications, Information Technology & the Arts, "Connecting Australia! Wireless Broadband" (2002) at 2; ACCC, "Emerging Market Structures in the Communications Industry" (2003) at 15

[6] ACCC, "Snapshot of Broadband Deployment as at 31 December 2004" (2005) at 5; cf the definition in ACCC, "Internet Interconnection Service- Final Report" (2004) at 3

[7] Department of Communications, Information Technology & the Arts, "National Broadband Strategy Implementation Group- Government Action Plan" (2005) at 2; Telstra Corporation Limited, "Inquiry into Wireless Broadband Technologies- Submission to the House of Representatives Standing Committee on Communications, Information Technology and the Arts" (2002) at 6; Department of Communications, Information Technology & the Arts, "Australia's National Broadband Strategy" (2004) at 4

[8] Australian Communications Authority, "Telecommunications Performance Report 2003-2004" (2004) at 95

[9] see Pondarosa Communications, "Options for Supply of Telephony Services (Technologies and their Implications)- A Report for the Australian Competition and Consumer Commission" (2004) at 19

[10] Australian Communications Authority, "Wireless LANs - design and security" ACA Consumer Fact Sheet

[11] Department of Communications, Information Technology & the Arts, "Australia's National Broadband Strategy" (2004) at 5

[12] see Australian Communications Authority, "New broadband wireless initiative proposed" ACA Connections, September 2004

[13] Australian Communications Authority, "Wireless LANs - licensing requirements" ACA Industry Fact Sheet

[14] Australian Communications Authority, "Wireless LANs - what and how" ACA Consumer Fact Sheet

[15] ACCC, "Internet Interconnection Service- Draft Report" (2004) at 100

[16] section 42 Telecommunications Act 1997

[17] see Australian Communications Authority, "Submission to the Inquiry into the Current and Potential Use of Wireless Technologies to Provide Broadband Communications Services in Australia" (2002) at 5

[18] see Part 2 of the Telecommunications Act 1997. The main exception relates to radiocommunications equipment used on a non-commercial basis under sections 34(1)(h) and (3) of that Act.

[19] Communications Law Centre, "Australian Telecommunications Regulation" (2001) at 37

[20] Minister for Communications, Information Technology & the Arts, "Determination under Subsection 51(1) (No. 1 of 2002)" 12 September 2002

[21] see Australian Communications Authority, "Wireless LANs- licensing requirements" ACA Industry Fact Sheet; Minister for Communications, Information Technology & the Arts, "Explanatory Statement- Determination under Subsection 51(1) (No. 1 of 2002)" 12 September 2002