

Personal Broadband

BWA in Action

ITU-APT Seminar on BWA
 Friday, 10th September 2004
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Personal Broadband Australia (PBA)

- PBA operates a commercial and fully mobile BWA network **today!**
- Our service covers over 800 sq km in NSW and Queensland.
- We are transforming the concept of personal and business computing in much the way that the mobile telephone liberated our voice communications.

"It will spread around the world, it's an absolute 'must have'"
Martin Eckstein - Fujitsu

"iBurst delivers on its promise... great coverage and easy to use..."
Clifford Rosenberg – MD Yahoo Australia & NZ

- For anyone that has struggled with dial-up modems, never-ending downloads, hotel phone bills that cost more than the room or searched in vain for a WiFi 'hot spot' our service is truly a **totally liberating experience**.
- The network uses ArrayComm's **iBurst** BWA technology and provides anywhere, any time, broadband connectivity in Sydney and the Gold Coast and shortly to other Australian cities such as Melbourne, Canberra and Brisbane.

The iBurst service in Australia is the world's first commercial deployment of iBurst

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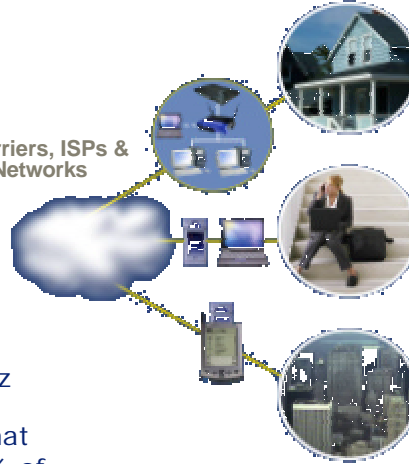
PBA's iBurst Service



High speed:

- » 1 Mbit/s/user downlink
- » 345 kbit/s/user uplink
- Mobile, portable or fixed use
- Always on
- Standard IP devices, apps
- Efficient: >20 Mbit/s/cell in 5 MHz
- Dedicated Spectrum (3G TDD) that reaches 75% population and 90% of businesses

Carriers, ISPs & IP Networks



PBA's Service is distributed by established Australian ISPs and Carriers

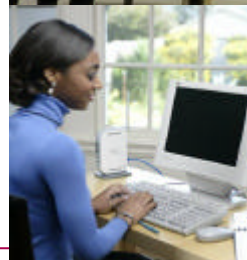
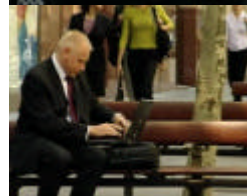


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Laptop, PDA, Home or Network



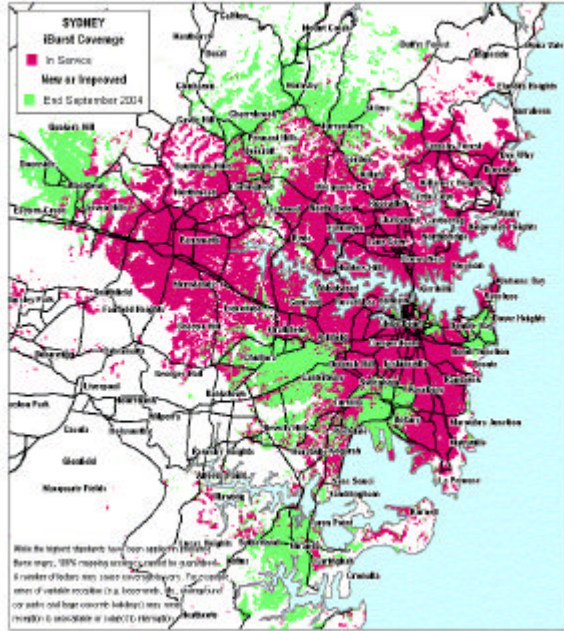
- Mobile connectivity
 - PCMCIA card
 - Connect to Laptop or PDA
 - Unrestricted mobility
 - Low power consumption
 - Tx 21 dBm max
 - Sleep mode
- Fixed/Portable connectivity
 - Desktop connectivity
 - Network connectivity
 - Ethernet or USB
 - 1 Mbps speed
 - Tx 25 dBm



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Rollout strategy

- Cover high density areas where targeted business users work and live:
 - » CBDs
 - » Airport Corridors
 - » Inner City (businesses and high value residential areas)
 - » Residential Suburbs
- Expand coverage:
 - » Technology Parks
 - » Outer Residential Areas
 - » New Residential Developments
- Replicate deployment methodology for all Capital cities and expand to other major towns



BWA - Key Operational Criteria

- A technology that delivers 'best in class' network economics and functionality:
 - » High throughput capacity per base station
 - » Large cell radius for ubiquity
 - » Non line-of-sight radio transmission characteristics
 - » Best possible capex per subscriber
 - » IP Based
 - » Full mobility & load balancing
- Simplicity in network architecture :
 - » Design maximizes off-the-shelf standard products
 - » Pure IP networking & backhaul
 - » Easy to build and integrate
- Field proven – robust & reliable performance
- Time to Market
- Equipment Vendors:
 - » Proven ability to scale manufacture
 - » Resources available to support deployment as well as development
 - » Credible technology roadmap
 - » Multi-source (especially CPE)

PBA believes iBurst technology offers the lowest cost, best performance and field proven track record



Why iBurst?



- iBurst meets our operational criteria:
 - » iBurst is a field-proven, commercialized, BWA technology that is available NOW.
 - » It is the **most spectrally efficient BWA technology currently available** due to the realisation of spatial channels using adaptive antenna technology:
 - ArrayComm claim 4 bits/s/Hz/cell
 - PBA has measured over 6 bits/s/Hz/cell in the field
 - » Adaptive antenna technology also provides improved link budgets allowing significant range extension.
 - » It is 'IP transparent'
 - » The user terminal (CPE) is relatively simple in design and has a low power consumption (maximum RF transmit power of only 21 dBm) – easily powered by laptops & similar devices.

The above factors drive compelling network economics that provide the best-in-class ratio of cost per sq km for capacity delivered



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Why Australia?



- Australia is a great place to live and run a BWA business!
- The Australian government's regulatory policy has been designed to be as un-prescriptive as possible, importantly;
 - » Spectrum sold by auction is "unbundled" (i.e. spectrum is not generally grouped presuming an intended purpose)
 - » A "technology neutral" approach is taken (with interference provisions to allow co-existence of spectrum users)
 - » Post-auction trading of spectrum is permitted
- These factors created the right environment for the deployment of a new and innovative technology such as iBurst

PBA launched its iBurst service in March 2004



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So What About BWA Standards?



- iBurst is not a standardized technology – yet; and neither are Navini, Flarion etc.
- But iBurst BWA *is* available today.
- With iBurst, PBA is offering a mobile BWA service 2-3 years ahead of the proposed equivalent standards (e.g. 802.16e) – we simply can't wait for the standardization process to catch up.
- But we will embrace appropriate standards as they become available.
- Our product performs outstandingly well, is field proven, and delivers compelling operator economics.
- We are not anti-standards, but do question whether the traditional standards process can keep pace with technology development.
 - » In 1991 the UMTS (European 3G standards group est.)
 - 2003: 3G finally delivered
 - » In 1991, no email, no web, IP in infancy
 - 2003: web, email indispensable tools; all IP
- Our markets are ready for mobile BWA now – is the standards process failing them?

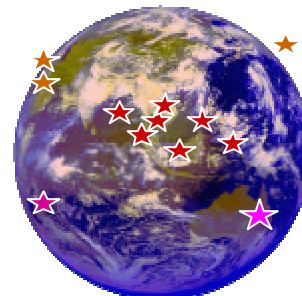


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International Benefits



- Significant International interest and activity:
 - » PBA has hosted reference and fact finding missions from
 - Austria
 - **France (trials conducted 2003)**
 - Hong Kong
 - India
 - Indonesia
 - **Korea (trials conducted 2002 & 2003)**
 - Mexico
 - Singapore
 - **South Africa (network launch Oct 2004)**
 - **UK (trials underway)**
 - **USA (trials underway)**
 - Thailand
 - Angola
 - Taiwan
- Strong interest in roaming potential of iBurst



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