

Session 2:

The major services – health and education

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Outline

- The Australian education sector
- Higher education & AARNet
- Schools (bandwidth, requirements & architecture)
- Content as the driver
- Residential BB growth c.f. school BB speeds & applications
- Lessons from early experiences
- Why target health and education?
- Are Australian governments doing enough?

The Australian education sector

	HE	VET	All Schools	Govt. Schools	Catholic Schools	Ind. Schools
Sector	42	85	9598	6930	1689	979
Campuses	>500	>1460¹	>9598	>6930	>1689	>979
Students	0.93m	1.69m	3.3m	2.2m	0.7m	0.4m
Staff	89,370	na	306,000			
Government Funding 2003	\$4.95b	\$4.4b	\$19.9b			

1. TAFE campuses only. Also 890 community education and 3400 private providers

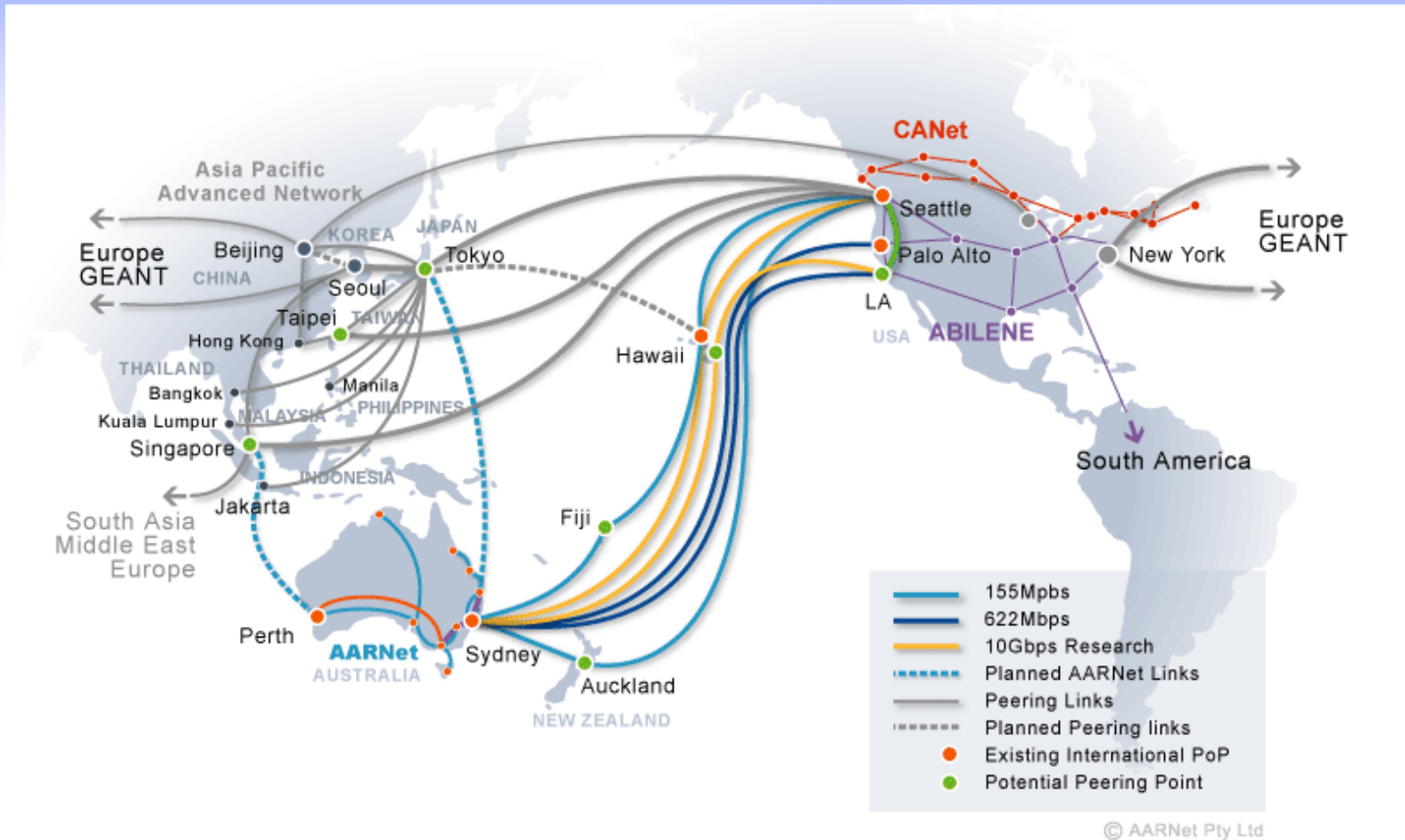
Higher education & AARNet

- Private 10Gb national fibre backbone with 2*622Mb for international commodity traffic plus donated 2*10Gb links for R&E traffic;
- All members will have 1Gb access to AARNet by March 2006;
- A subscription “all-you-can-eat” model for R&E traffic;
- AARNet is a net content provider to the Australian commodity Internet;
- AARNet is part of a Global Terabit Data Network community.

AARNet services

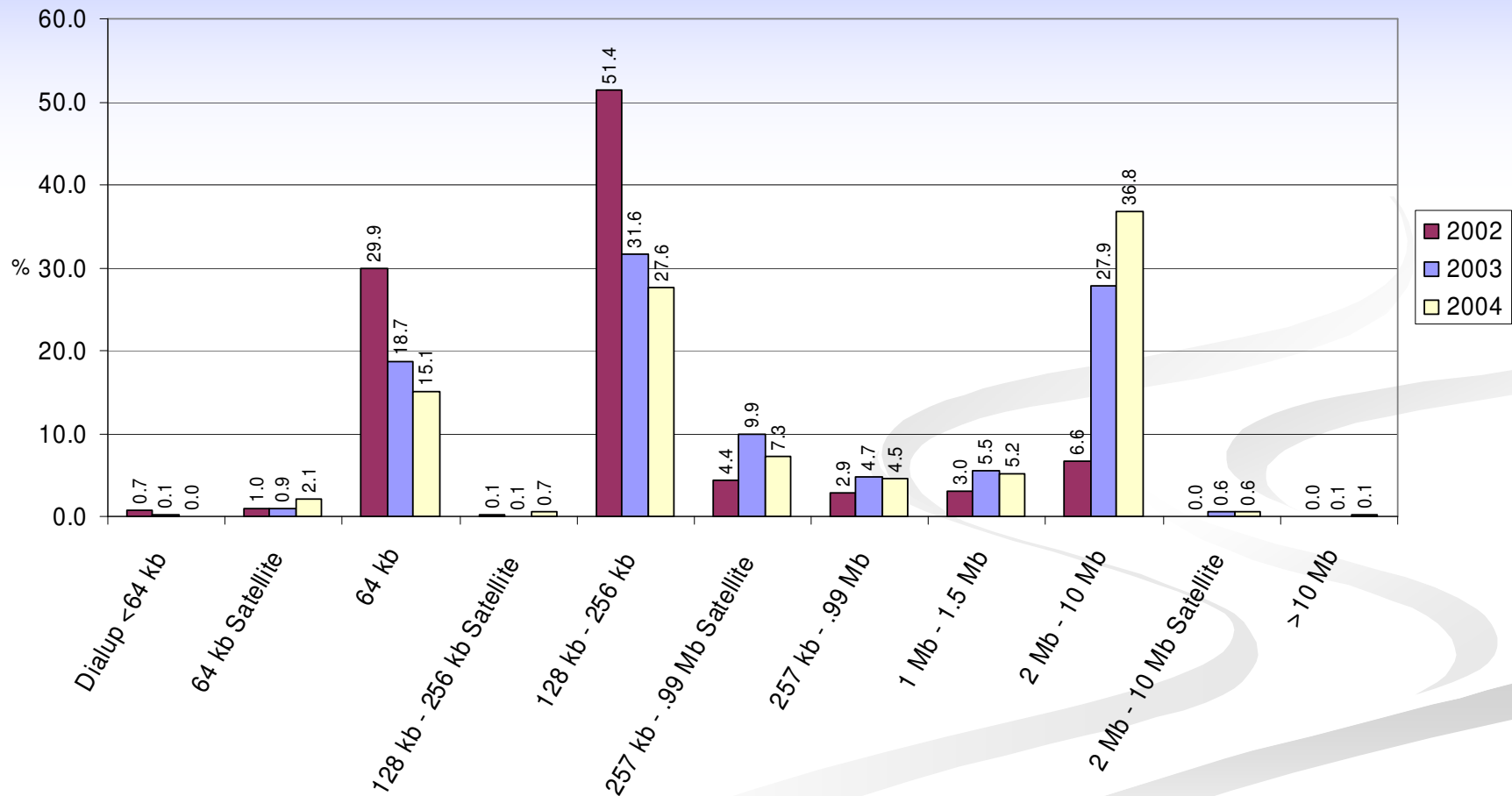
- Routed IP and native IPv6 network with diversity for reliability and QoS for real time traffic;
- User controlled light paths coming soon (1Gbps on demand point to point)
- Voice and video over IP since the late 1990's
- Multicast (e.g. access grid, compute grids)
- A national large objects mirror (e.g. open source software images);
- Direct connections with many cultural institutions;
- Developing a national video streaming infrastructure.

AARNet national & international links



Schools sector bandwidth

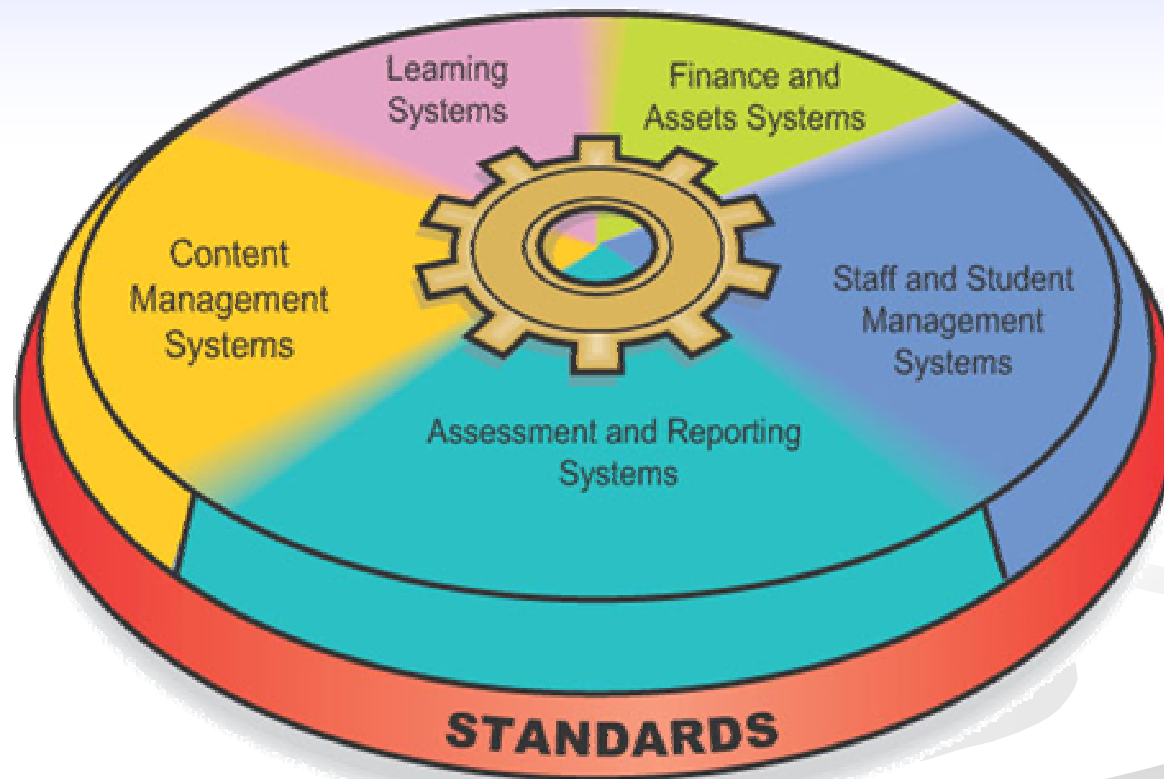
Bandwidth Provision to Australian Government Schools - 2002 - 2004



School sector requirements

- A properly resourced safe and effective online learning environment
- Need to deliver high quality curriculum to prescribed content and performance standards;
- Applications include email, Internet access, access to learning object repositories, learning and content management systems plus administrative systems;
- Student and parent access from home via education portals;
- Emerging applications such as schools portals, LMS, CMS, ePortfolio's, SMS use for exam results & absences, collaborative applications such as CENTRA.

School learning architecture



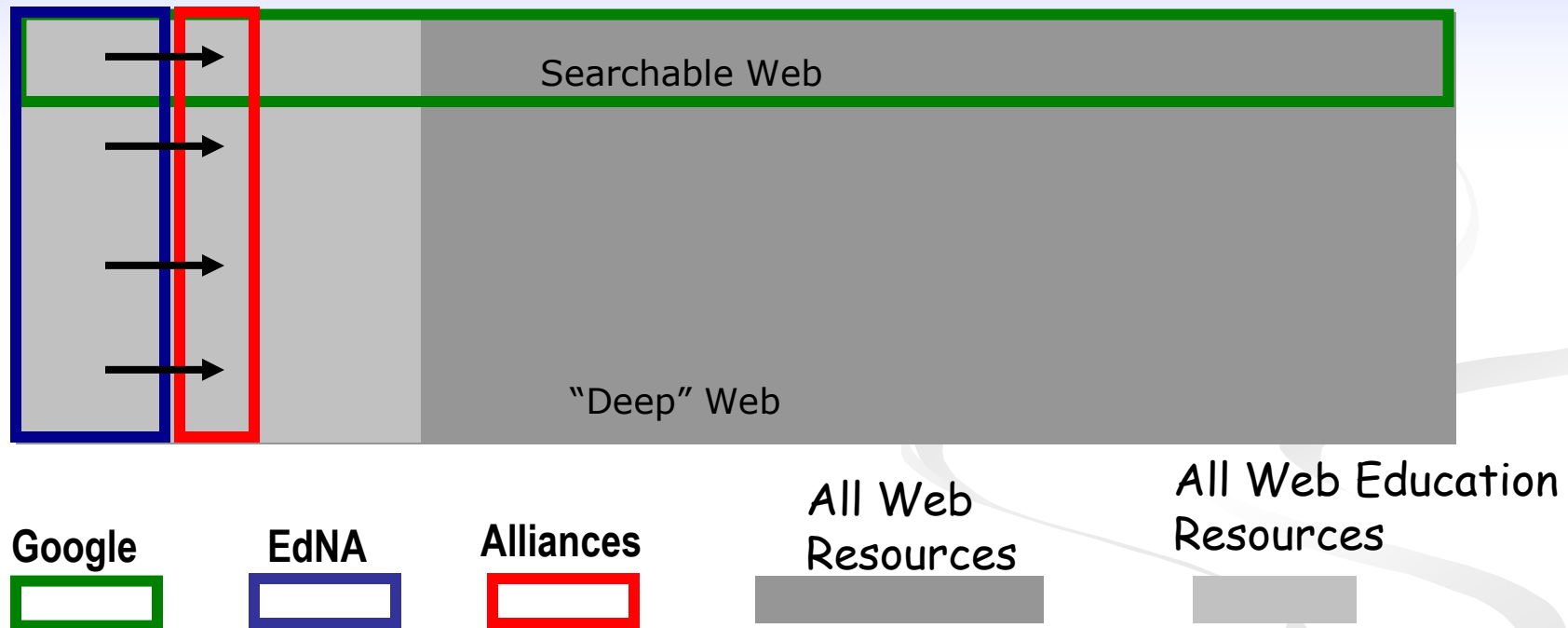
National education content initiatives:

National Online Services



Content Model for Education

Provide deep access to major collections of education resources in Australia and internationally



Residential BB growth predictions

Time Frame	User development	BB speeds	Key applications
2003 - 2005	Early adopter	300 - 500Kb/s	Always-on Internet
2005 - 2007	Seasoned user	2Mb/s	Internet plus photos
2007 - 2009	BB a part of life	6-10 Mb/s	Triple-play/ video entertainment
2010 - 2015	Fully integrated BB	25 – 45Mb/s	Telework, education, healthcare, hobby, entertainment

(Source: Paul Budde Communications)

BB speeds and school applications

Time Frame	School development	BB speeds	Key applications
2003 - 2005	Most schools	64 -512Kb/s sym, 1.5M async	Limited student Internet use (email, search)
2005	Advanced ICT school	2 – 4 Mb/s sym.	Education portal, limited LMS/CMS use
2005 - 2007	Most schools	2 – 4 Mb/s sym.	Education portal, limited LMS/CMS use
2007 - 2009	BB a part of school life	4 - 100 Mb/s	LMS integrated into daily curriculum, LO used extensively, limited online video/ voice collaboration
2010 - 2015	Fully integrated BB	100Mb/s – 1Gbps	Extensive online collaboration, daily use of digital content, student e-portfolios...

Lessons from Early Experiences

- Must focus on the business drivers for bandwidth;
- Balance investments with student/PC ratios, school LAN deployments, teacher PD, online content development and integrating ICT into the curriculum,.
- Conflict between school autonomy and a centralised ICT model;
- Cultural differences between education sectors and competition within sectors are barriers;
- Treasury departments don't fully understand the bandwidth needs for curriculum use.

Why target health and education?

- xDSL is not the long term solution for educational sites – must have fibre to the school to move to 10Mb, 100Mb, 1Gb+;
- Education > 50% of government broadband use - with health we can deliver a business case for improved regional services;
- The dominant carrier aggregates education & health demand below the line – who gets the benefit?

Are Australian Governments doing enough?

- State/Territory funding of school BB is mixed (e.g. state variation: 50% on 256K ADSL, 90% at 2Mb, all metro sites on 10Mb);
- Equity issue versus “picking the low hanging fruit”
- Australia alongside Canada & Iceland as the most highly urbanized (OECD) countries yet Canada has 17.8 vs. Australia 7.7 broadband users/100 people.
- Is broadband connectivity that hard? – mobile operators achieve population coverage of 92% with landmass coverage of 3%¹;

¹ ITU Australian ICT Data Collection Study July 2005

What more can Australian Governments do?

- Marginal cost of fibre when renewing other infrastructure is low
- Stimulate private sector broadband penetration by:
 - Lowering costs/obstacles for right of way;
 - Simplify contractual and price arrangement (e.g. liability/indemnity, unrealistic fibre pricing) in dealing with GBE;
 - Support local governments building on a non-exclusive basis conduit and dark fibre infrastructure;
 - Acknowledge that private enterprise cannot meet the BB needs of say 80% of regional/ remote Australians.