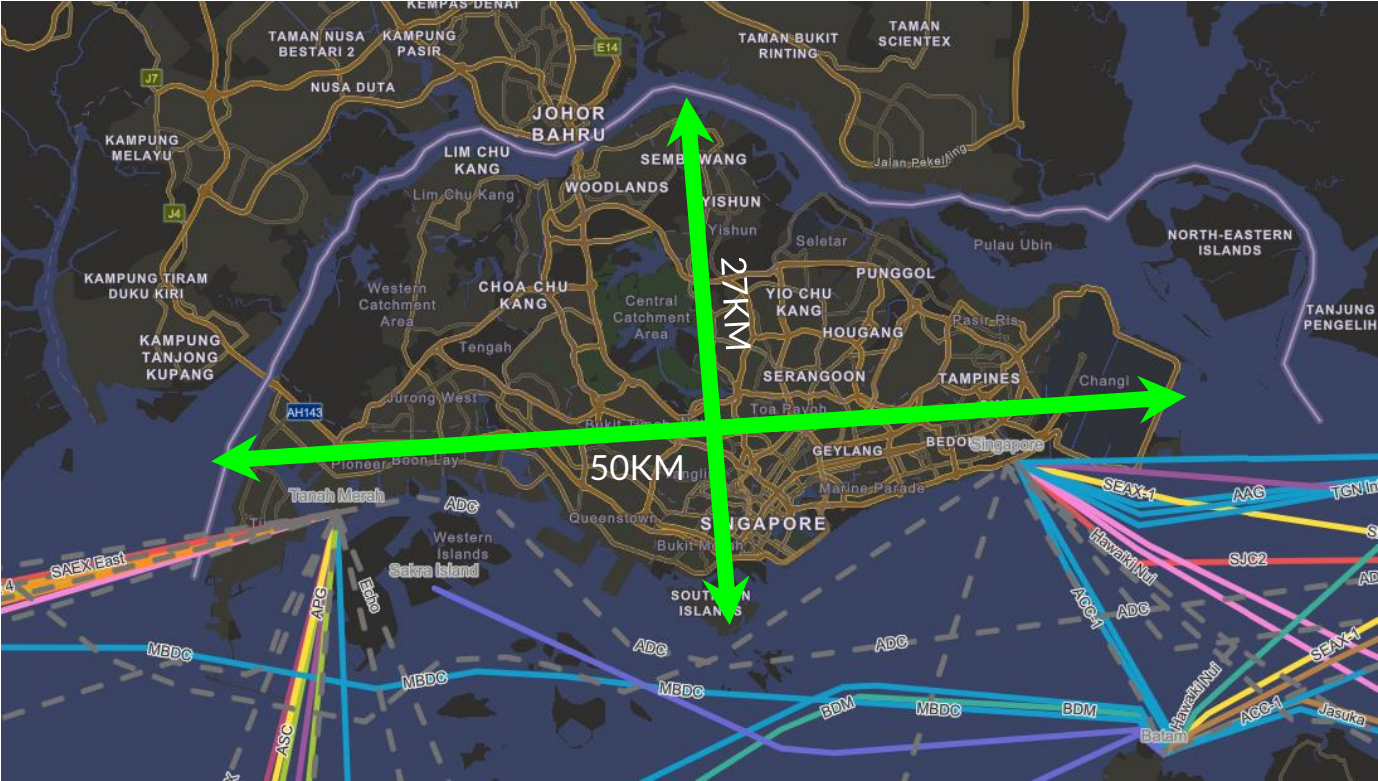




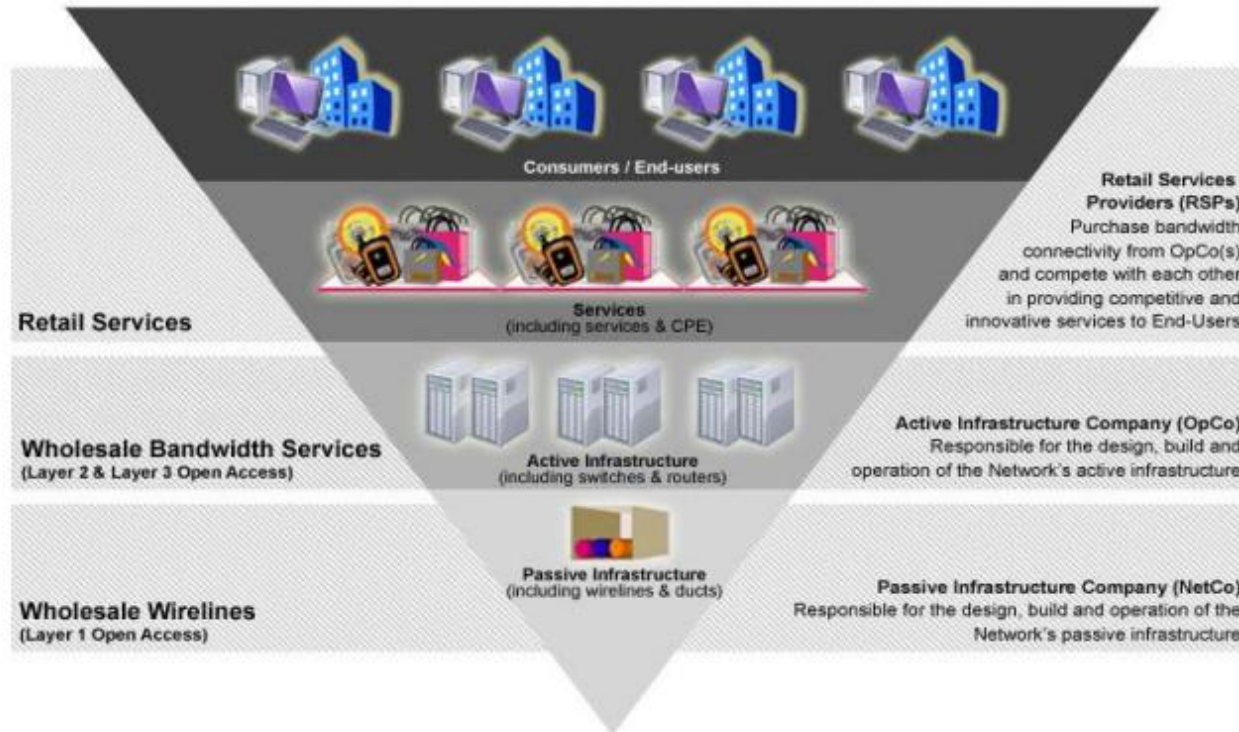
Singapore's Next Generation National Broadband Network

A case study into the last 10 years

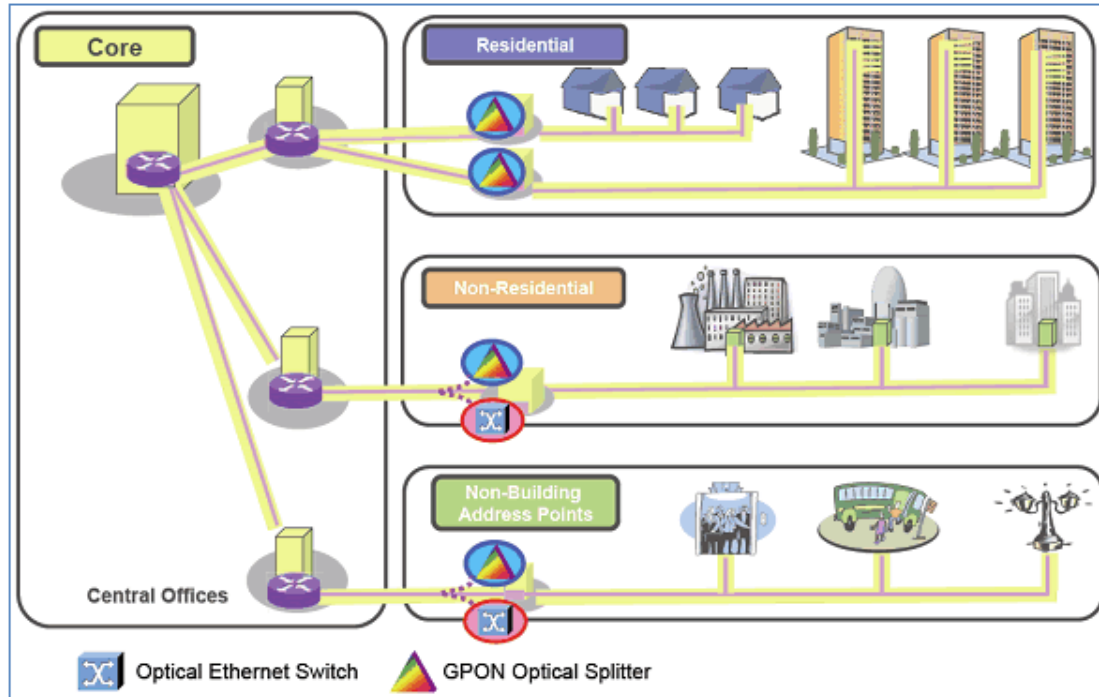
Singapore



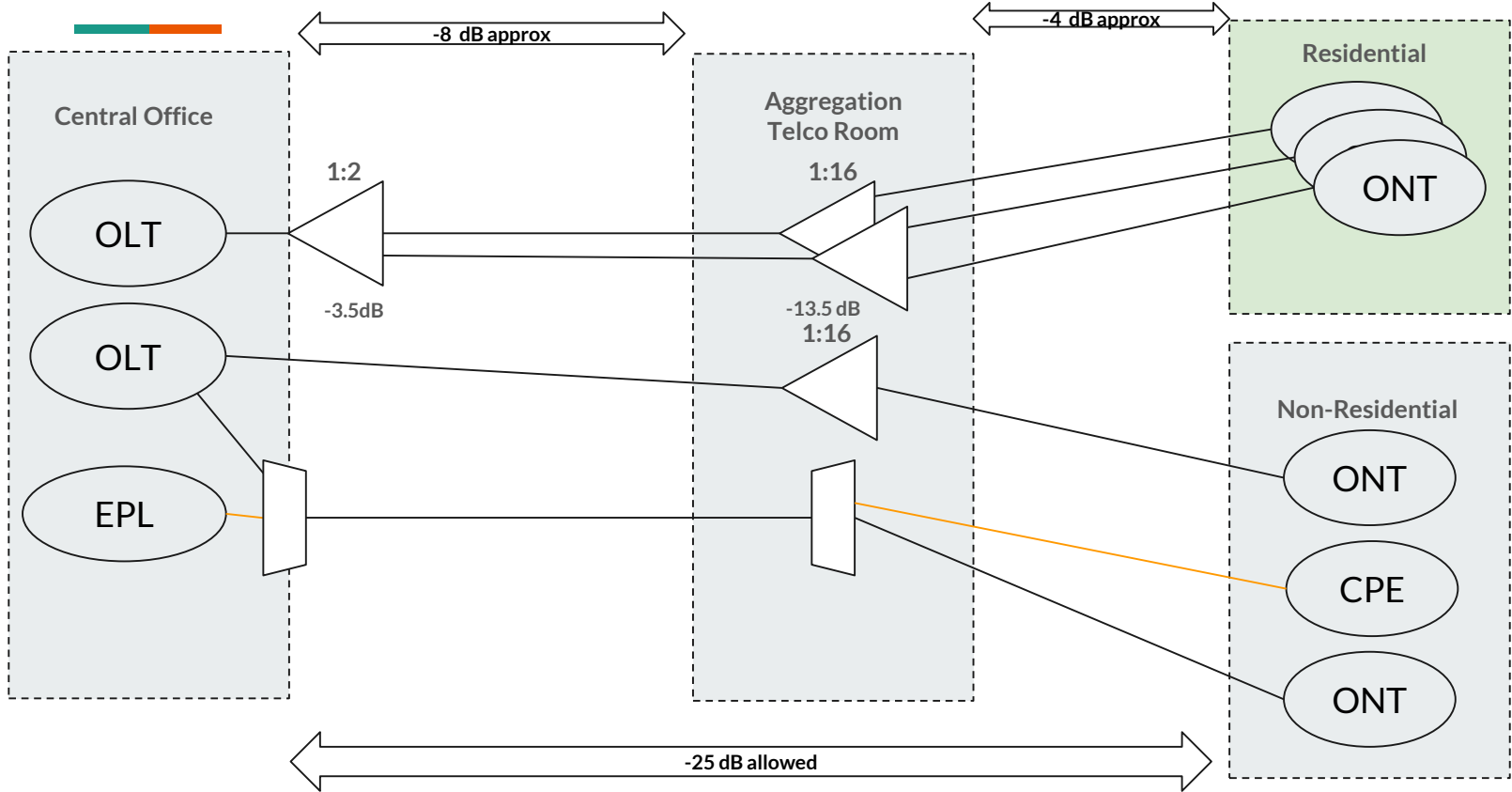
Structure of NBN



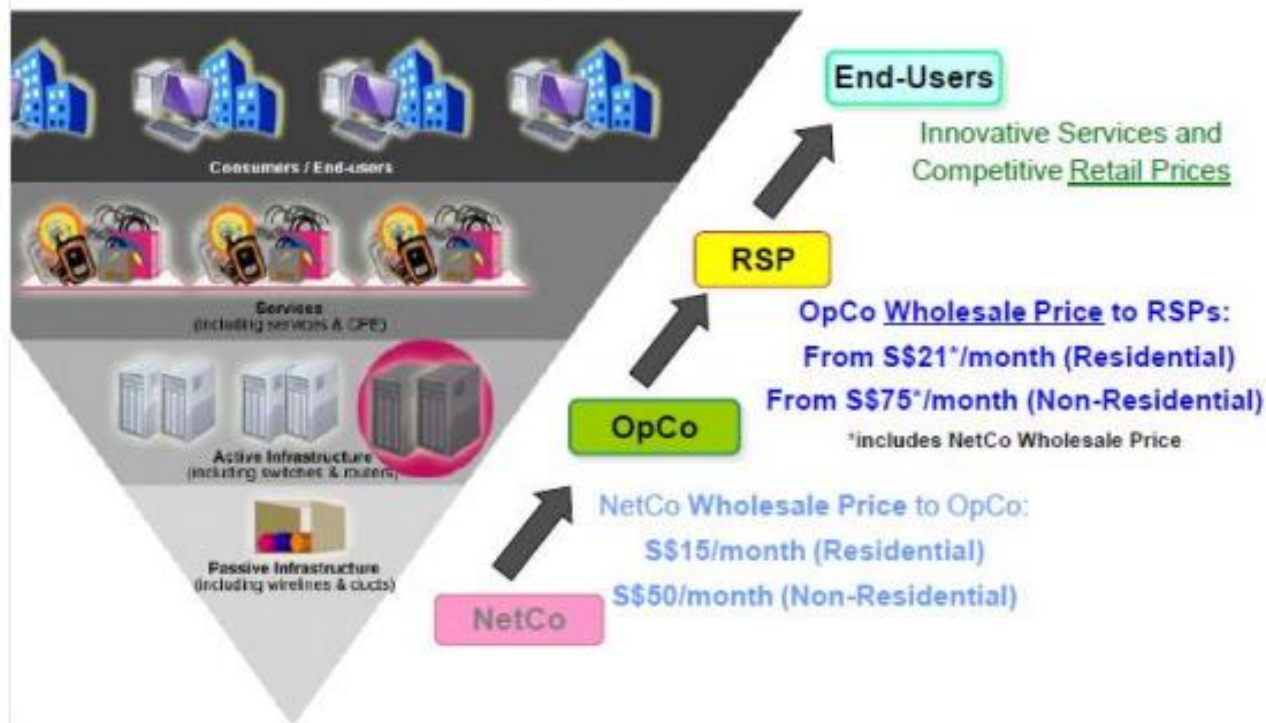
General network



How does it connect?



Cost Structure (2011)



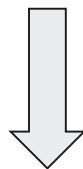
What is the impact

Operator	Retail Prices	Promotional Prices (for 100 Mbps) at IT Fairs		
		Aug 2012	Nov 2012	Mar 2013
SingTel	\$49.90	Special Promotion: <u>150 Mbps at \$47 to \$50</u>	Special Promotion: <u>150 Mbps at \$47 to \$50</u>	<p><u>150/300 Mbps at \$49.90/\$79.90 (Bundled)</u></p> <p><u>150 Mbps at \$49.90 (Bundled)</u></p> <p><u>100 to 250 Mbps from \$39.00 to \$51.00 (Bundled)</u></p> <p><u>150Mbps at \$65</u></p> <p><u>100Mbps at \$38.88; 150Mbps at \$48.88</u></p>
StarHub	\$68.27			
M1	\$59.00	\$39.00 bundled	\$49.90 bundled (200Mbps)	
ViewQwest	\$59.95	\$59.95	\$79.95 (200Mbps)	
MyRepublic	\$59 - \$89	\$59 - \$89	\$59 - \$89 with voice	

Lowered Prices and Greater Value

Impact over the years

2014	M1	M1	SingTel	Starhub	StarHub	MyRepublic	Viewqwest	Viewqwest
Bandwidth	100Mbps	1Gbps	500Mbps	100Mbps	1Gbps	1Gbps	200Mbps	1Gbps
MRC	\$39.00	\$399.00	\$69.95	\$59.90	\$395.50	\$49.99	\$59.95	\$149.95
MRC NT\$	\$1,402	\$9,484	\$1,663	\$1,424	\$9,401	\$1,188	\$1,425	\$3,564

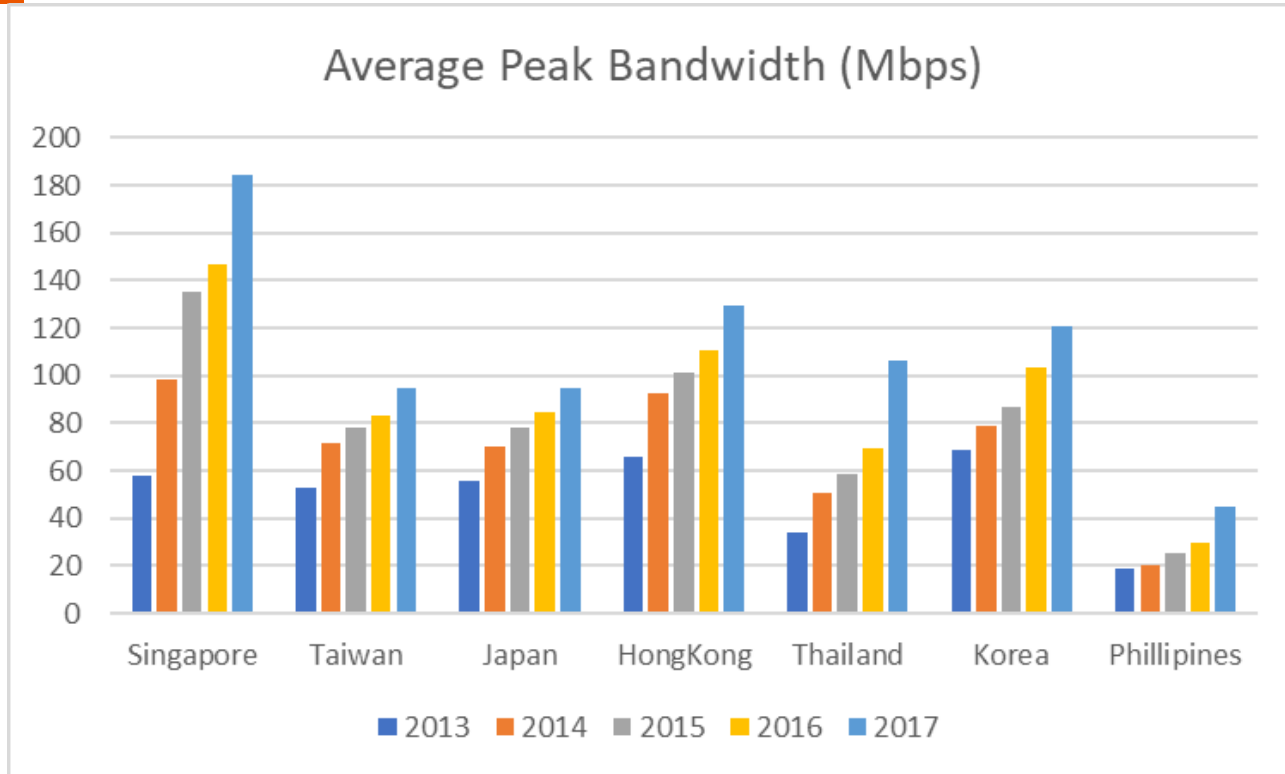


10 years
later...

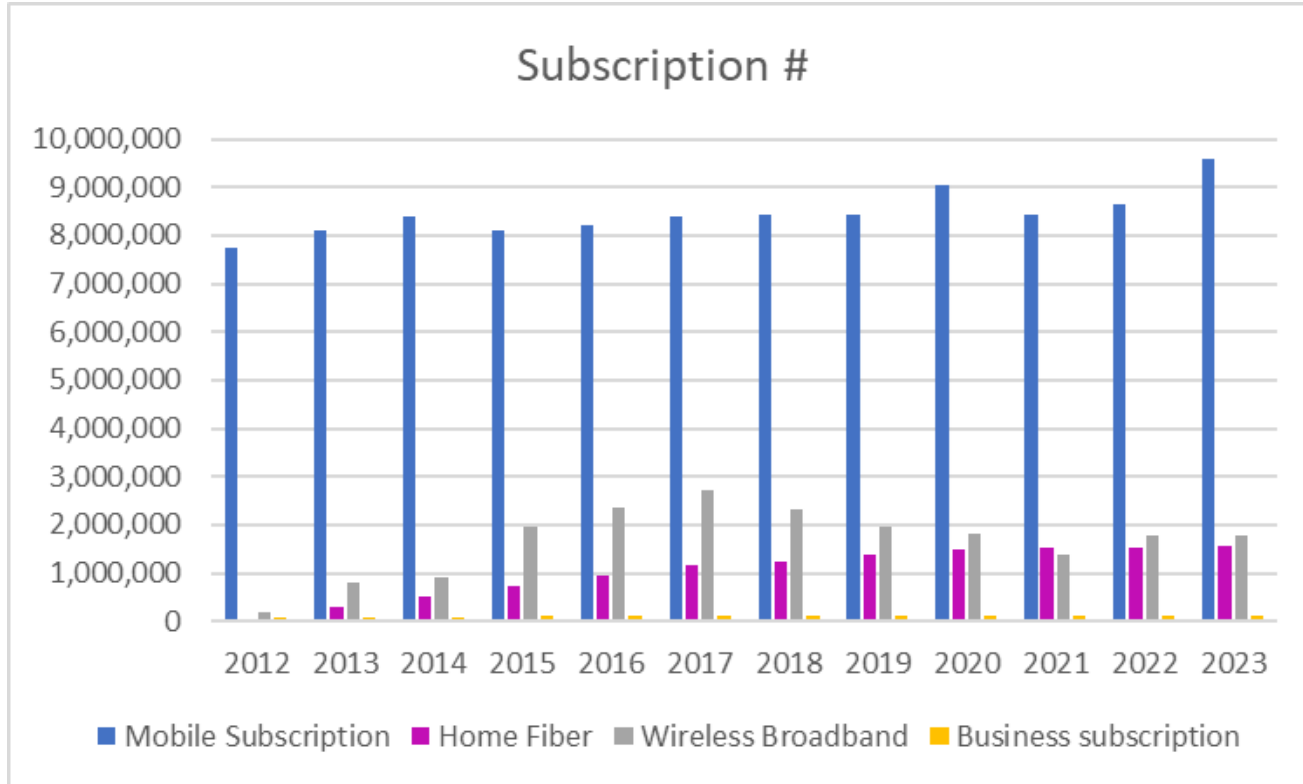
2024	M1	SingTel	Starhub	StarHub	MyRepublic	MyRepublic	Viewqwest	Viewqwest
Bandwidth	1Gbps	1Gbps	1Gbps	10Gbps	1Gbps	10Gbps	1Gbps	2.5 Gbps
MRC S\$	\$38.99	\$53.40	\$43.30	\$69.95	\$36.99	\$59.99	\$29.99	\$41.98
MRC NT\$	\$927	\$1,269	\$1,029	\$1,663	\$879	\$1,426	\$713	\$998

*Price reduction from NGNBN from S\$15 to S\$13.80 (2018) and further to S\$13.40 (2024)
Non residential line price change from S\$50 to S\$55 (2018)

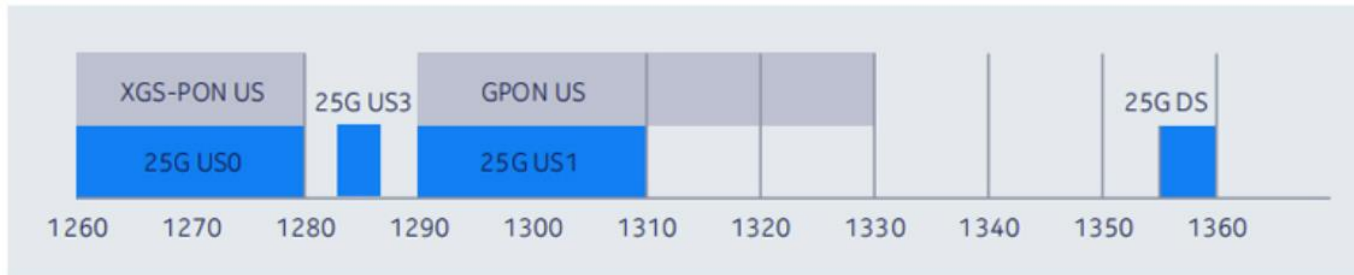
Impact over the years



Impact over the years



Coherent use of NGNBN



Whats Next?



Singapore

Singapore to invest up to S\$100 million to boost broadband network to 10Gbps; upgrade to start from mid-2024

The S\$100 million upgrade comes nearly two decades after the first investments in Singapore's nationwide broadband network.

Conclusion?



- Shared National Broadband Network reduce the cost for providing fiber services
- Mobile services subscriptions increase together with fiber home broadband installation
- Cost reduction in mobile fronthaul for 5G
 - Using 25G/XGSPON
 - Using DWDM (Open ZR+)



Question?