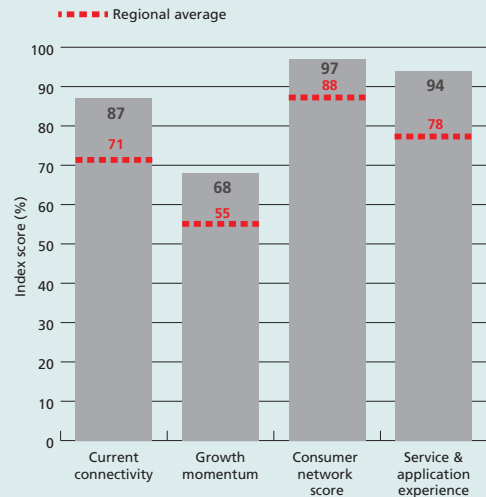




Sweden

Demographics 2014

- Population: 9.6m
- Median age: 41
- Urban population: 85%
- GDP (per capita): US\$58,164
- Household fixed broadband penetration: 67%
 - cable modem household penetration: 13%
 - FTTx household penetration: 27%
 - xDSL household penetration: 26%
 - Other broadband household penetration: 1%
- Ovum Broadband Development Index Ranking:
 - Global ranking: 12 (out of 191)
 - Europe ranking: 4 (out of 52)



Sweden Scorecard comment

Sweden was a strong performer in the most consistently strong region in the survey, and is in fact the strongest overall performer in our whole survey with an overall score of 88%, compared to the European average of 74%. This was despite having only a moderate overall broadband household penetration. However, it scored strongly on all other Current Connectivity variables, particularly the proportion of fast broadband, international bandwidth, download bandwidth, and ICT activity (as measured by the number of IP addresses as a proportion of Internet users). Sweden also performed well on broadband affordability and the number of competitors in the market.

Sweden performed strongly on Growth Momentum. It did well on IP address growth and had a particularly strong national broadband plan. Despite these advantages, overall subscriptions were

growing at rates below the global average, consistent with its developed market status. The rate of migration to higher speed plans was moderate. However, it did well compared to other saturated European markets,

Sweden scored very strongly for consumer network score. On every variable, including satisfaction with broadband speed, and with web, music, gaming and video performance, Sweden scored in the top group in Europe and globally. Sweden was also well ahead of the regional average for Service and Application Experience, with a very strong performance for overall application experience, and a strong performance in broadband speeds meeting expectations, service installation and service reliability.

It is difficult to fault such a consistently strong performance. Service providers can take credit for investing in a

network that yields the very high levels of customer satisfaction. The one area that might be termed disappointing is that household penetration still stands at 67% while the rate of subscription growth is below the global average.

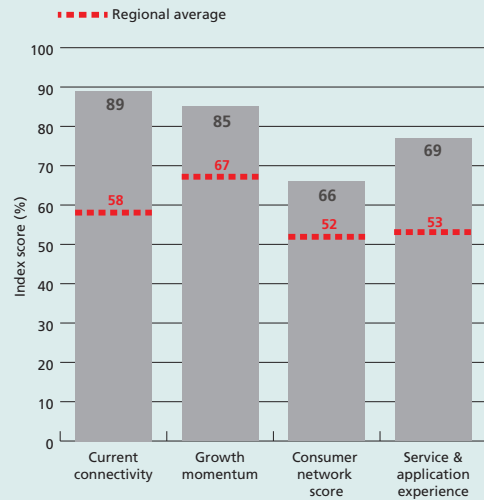
However, this needs to be kept in perspective. Sweden is ahead of its targets in terms of meeting the EU broadband target to achieve access to 30Mbps broadband speed for all European households and provide 100Mbps broadband network speed access to at least 50% of European households by 2020. It has set the target of achieving 90% coverage of 100Mbps fixed broadband access by 2020, and achieved 49% coverage of 100Mbps fixed broadband access in 2011. There is good reason to expect much higher rates of penetration in the medium term.



Singapore

Demographics 2014

- Population: 5.4m
- Median age: 39
- Urban population: 100%
- GDP (per capita): US\$55,182
- Household fixed broadband penetration: 118%
 - xDSL household penetration: 17%
 - cable modem household penetration: 39%
 - FTTx household penetration: 61%
 - Other broadband household penetration: 1%
- Ovum Broadband Development Index Ranking:
 - Global ranking: 2 (out of 191)
 - APAC ranking: 2 (out of 43)



Singapore Scorecard comment

Singapore emerged as the leading APAC country in our survey of broadband performance. What sets Singapore apart from other countries is that it achieved very high scores on both Current Connectivity and Growth Momentum. No other country in the region achieved this to the same extent.

Current Connectivity was driven by Singapore's mature and highly penetrated market. Connections are dominated by fiber and cable modem technologies, and there is a very high proportion of customers on high speeds. Singapore's position as a major business and transport hub means that it also has abundant international connectivity and ICT activity (as measured by the number of IP addresses as a proportion of Internet users). It also performed well on broadband affordability, and on telecommunications investment as a percentage of GDP. Its only area of weakness was low competition, with the retail market still dominated by two major players (though this is changing).

Normally this profile would be correlated with low Growth Momentum. Although growth in total broadband connections was slow, it scored strongly in average speeds, the rate of conversion to higher speeds, and the rate of growth of IP addresses. This was driven by Singapore's aggressive fiber rollout plans, with good cooperation between operators and government to extend FTTx infrastructure across the city-state.

This does not mean there is no room for improvement. Singapore's score on Consumer Network Score and on Services and Application Experience was also well above the APAC average, but there were specific areas where customers expressed dissatisfaction. Problem areas nominated by customers included lag in web downloads, and buffering of short videos. There was also some dissatisfaction with service installation and reliability, and the experience associated with it was below the global average.

These areas of lackluster performance may be associated with a longstanding

duopoly in the Singapore broadband market. However, the IDA sought to promote the development of next-generation access by conducting tenders for a next-generation national broadband network in 2007. The government offered US\$801m (S\$1bn) to build and operate an FTTH network, with structural and operational separation in passive and active network infrastructures respectively. A key motivation for this policy was to open up competition at the retail level, which Singapore's weak wholesale market had not allowed.

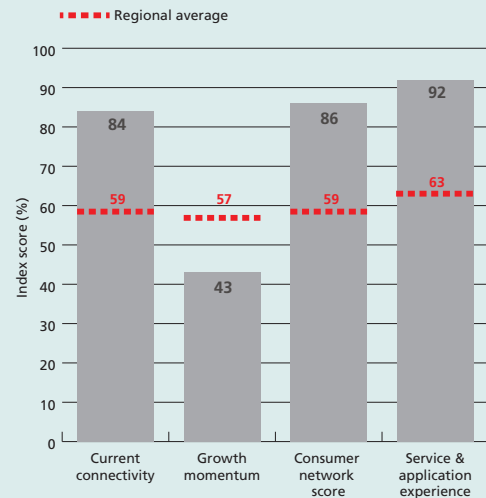
This policy is having success, with a national network rolled out, and new entrants in the retail market putting new pressure on the incumbents to improve reliability and affordability. There is good reason to be optimistic about improvements in both Consumer Network Score and Services and Application Experience as competition forces all operators in the market to improve customer experience and service.



Canada

Demographics 2014

- Population: 35m
- Median age: 40
- Urban population: 81%
- GDP (per capita): US\$44,586
- Household fixed broadband penetration: 85%
 - xDSL household penetration: 40%
 - cable modem household penetration: 40%
 - FTTx household penetration: 4%
 - Other broadband household penetration: 1%
- Ovum Broadband Development Index Ranking:
 - Global ranking: 10 (out of 191)
 - Americas ranking: 2 (out of 37)



Canada Scorecard comment

Canada is a fairly mature broadband market with a high level of household penetration and a high number of fixed broadband competitors (though some do not compete nationally). Despite performing strongly overall, Canada scored below the regional average in Growth Momentum. Its regional leadership was due to strong performances in Service and Application Experience, Current Connectivity, and particularly Consumer Network Score.

The Current Connectivity score was driven by very strong performances in number of competitors, overall broadband penetration, affordability, investment levels, international connectivity, and ICT activity (as measured by the number of IP addresses as a proportion of Internet users). However, the share of fast broadband services was only average, consistent with disappointment about available broadband speeds, as discussed below.

In contrast, the low Growth Momentum score was driven by slow growth in overall subscriptions, slow migration to fast broadband subscriptions, and

slow growth in IP addresses. Only in the quality of its national broadband plan did Canada score near the global average.

The Consumer Network Score results were very strong, but also consistent with a market that wants more fast broadband. While there was strong satisfaction with time to download web pages, and performance for music, games and video, satisfaction with available bandwidth was only moderate, suggesting that customers want to do more with their broadband services.

This is a warning to Canadian operators. However, it was balanced by a very strong cross-the board performance for Service and Application Experience. Customer want more speed, but at least they agree strongly that they are delivered the speeds that are promised. Service connection experience and service reliability were very strong, indicative of a strong service culture amongst operators. Application experience was also very strong by global standards.

Despite the overall strong performance, there is a hunger for bandwidth. However, there are grounds for

optimism. Several operators are expanding the coverage of FTTP in their footprints:

- In December 2014, Bell Aliant announced it passed its 2014 goal of 1 million homes and businesses with FTTP service. Bell is continuing to invest in extending both wireline and wireless broadband services.
- In April 2015, Telus announced investments to expand its FTTP footprint in Alberta and Quebec.
- Also in April 2015, Sasktel said it is investing in expanding FTTP to 27,200 more homes in Saskatchewan this year; the company added 22,700 homes to its FTTP footprint last year.
- Sasktel's broader investment plan, announced in 2012, is to cover 100% of the homes it serves in the nine major cities in Saskatchewan by 2020.

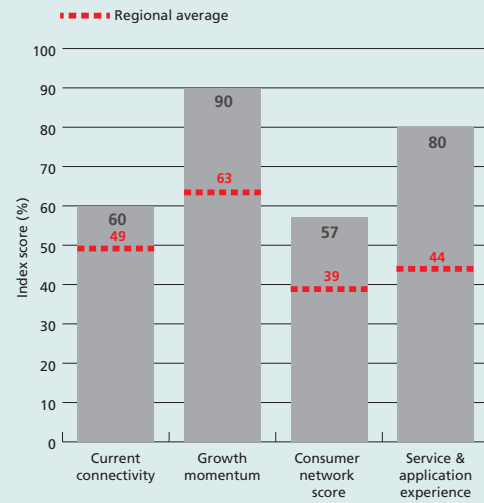
Canada is a very strong broadband performer at the moment. But the growing importance of, and demand for, fast broadband will require a stronger investment commitment to reach the roughly 60% of the population without access to a high speed infrastructure.



UAE

Demographics 2014

- Population: 9.3m
- Median age: 30
- Urban population: 78%
- GDP (per capita): US\$63,497
- Household fixed broadband penetration: 122%
 - xDSL household penetration: 10%
 - cable modem household penetration: 11%
 - FTTx household penetration: 100%
 - Other broadband household penetration: 1%
- Ovum Broadband Development Index Ranking:
 - Global ranking: 6 (out of 191)
 - MEA ranking: 1 (out of 59)



UAE Scorecard Comment

The UAE stood out in its region as a consistently strong performer against all four benchmarks compared to its regional peers. However, there are also areas of weakness that need to be addressed for the UAE to join the leading broadband countries in other regions.

The UAE's Current Connectivity score was 60%, high for the MEA region but only average globally. It performed strongly in areas such as the proportion of fast broadband and investment levels, and performed moderately well in average bandwidth and international bandwidth. However, it was below average in areas such as affordability and ICT activity (as measured by the number of IP addresses as a proportion of Internet users). Some of this may be associated with low levels of competition, with only two major operators dominating the market.

However, the UAE's Growth Momentum score was one of the highest recorded globally at 90%.

This is driven by rapid increases in penetration, migration to fast broadband, growth in IP addresses and growth in average bandwidth. All of this provides grounds for optimism about Current Connectivity in the future. The only lackluster note was a weak national broadband plan, but this is amply compensated by operator aggression in expanding broadband networks. Etisalat has carried out an extensive fiber rollout program over the past few years, replacing its older DSL and cable networks. Du deployed fiber for its fixed network from the outset.

However, some issues arose in Consumer Network Score, UAE customers are displaying dissatisfaction in some areas such as availability of faster broadband and gaming and music performance. The UAE scored only around the global average for short video buffering, while above average for TV/video buffering.

In contrast, performance in Service and Application Experience was uniformly strong, with no area below the global average. There were particularly strong

performances in music and video, and service installation and reliability. However, usage of web, music and video is growing fast, and will place extra demands on infrastructure.

Although broadband rollout is proceeding quickly, there is an issue with affordability, possibly associated with low levels of competition. Plans to introduce competition in the UAE's broadband market have been delayed, partly because of a dispute between the operators over wholesale pricing for the bitstream access that would allow each operator to provide services over the other's network. These issues are expected to be resolved in the coming months.