

Juniper Networks Global Bandwidth Index

Summary

In 1994, only 25 million people had access to the Internet. This year that number will reach three billion, including 2.3 billion mobile broadband subscribers.ⁱ This dramatic increase has had a profound impact on how people around the globe communicate, work, learn, and play – a transformation that will continue as new technologies emerge, network speeds increase, and hundreds of millions of people who aren't yet connected to the Internet gain access.

To better understand how people use the mobile Internet in their day-to-day lives at work and at home today, and what they hope to achieve using their connected devices tomorrow, Juniper Networks commissioned the independent firm Wakefield Research to survey 5,500 adults in nine countries.

The study surveyed consumers in Australia, Germany, Japan, the United Kingdom and the United States – developed countries that are moving quickly to implement high bandwidth Long Term Evolution (LTE) networks capable of delivering mobile services up to 100 times faster than older networks. It also sampled consumers in Brazil, China, India and South Africa – emerging markets where networks tend to be slower and less reliable.ⁱⁱ

While the Juniper Networks Global Bandwidth Index found some similarities between developing and developed nations, it is the differences that really stand out. Key findings of the studies include:

- **Personal Advancement vs. Personal Convenience:** For people in developing countries, connected devices are often a tool for personal advancement and self-improvement, while in the developed world the focus is much more on convenience and efficiency.
- **The Education Opportunity:** People in developing countries are twice as likely to use connected devices for educational purposes as those in developed markets, and more than half of consumers in emerging markets would like to have access to more educational resources in the future, compared to less than one-quarter in developed countries.
- **Satisfaction Conundrum:** Consumers in emerging markets are significantly more satisfied with their networks than their counterparts in developed countries, a surprising result given that network speed and reliability tends to be better in developed countries.
- **Future Expectations:** For all differences between emerging and developed markets, people in both groups share a strong desire to be able to achieve more with their mobile devices, including devices doing more on their behalf and having broader access on public transportation.

The trends uncovered by the Juniper Networks Global Bandwidth Index study will help service providers, policy makers and technology companies prepare for a world in which the number of people accessing the Internet climbs to three billion and beyond, and the number of connected devices surpasses 35 billion.

Connectivity: A World of Differences

Twenty years ago connectivity was a rarity. Today, Internet access is so central to how people interact with one another, create and share information and conduct business that the United Nations has called broadband connectivity a basic human right on par with food, shelter and educationⁱⁱⁱ.

But not all bandwidth is created equal. In particular, the Juniper Networks Global Bandwidth Index reveals important differences between how consumers in emerging nations and those in developed countries use their connected devices today, how they feel about the quality of their connectivity and what they aspire to do with those devices in the future.



First and foremost, for consumers in emerging markets, mobile connectivity is seen as a catalyst for progress and change, while in developed countries, it is often seen as a tool for accomplishing day-to-day tasks more easily.

Consumers in emerging markets may access the Internet through networks that lack the speed and reliability of higher bandwidth networks such as 3G, 4G, and LTE, but this doesn't dampen their enthusiasm for the capabilities and services that connectivity offers – there is nearly universal agreement in Brazil, China, India and South Africa that connectivity has fundamentally changed people's lives for the better.

According to the study, 97 percent of people in emerging markets believe that connectivity has transformed the way they complete a wide range of essential and everyday tasks, everything from banking to accessing local information, enjoying entertainment, receiving health care and engaging in civic life.

Conversely, just three percent of consumers in emerging markets feel that their lives are unchanged by connectivity. Compare that three percent to the 22 percent of consumers from Australia, Germany, Japan, the U. K. and the U.S. – where broadband penetration is higher and networks are faster – who report that connectivity has not had a significant effect on their lives.

This difference is reflected strongly in people's professional lives, where men and women in developing countries are almost twice as likely to say that connectivity has changed how they

work compared to those in developed nations (52 percent vs. 26 percent). There is a corresponding impact on people's perception of economic opportunity: 40 percent of respondents in emerging markets report that connectivity has improved their earning power, compared with just 17 percent in developed markets.

Social interaction is another area where this split is apparent:

- Sixty percent of consumers in emerging markets believe that connectivity has transformed their social lives, compared with 38 percent in the developed countries
- People in developing countries are nearly twice as likely to believe that connectivity has improved their friendships (52 percent vs. 27 percent in developed countries)

But it is in education that this divergence is the greatest. In India, for example, 45 percent of people surveyed say that connectivity has fundamentally changed how they access textbooks, complete coursework or use teaching tools, compared with just 7 percent in Japan. Overall, 39 percent of people in the developing nations studied in the Juniper Networks Global Bandwidth Index have experienced a significant transformation in their access to education thanks to connectivity. In the developed countries, it is less than half.

Given the profound effect that survey respondents report connectivity is having in the developing world, it's not surprising that consumers in the emerging markets spend, on average, an hour more per day on their mobile device than their counterparts in the developed countries.

Making the Most of Their Lives vs. Making the Most of Their Day

A closer look at the survey data suggests that people in emerging markets and in developed countries get value from their connected devices in very different ways. The Global Bandwidth Index asked respondents to choose the three top categories of tasks that they use connectivity for.



The results indicate that for people in developing countries, connected devices are often a tool for personal advancement and self-improvement, while in the developed world the focus is much more on convenience and efficiency.

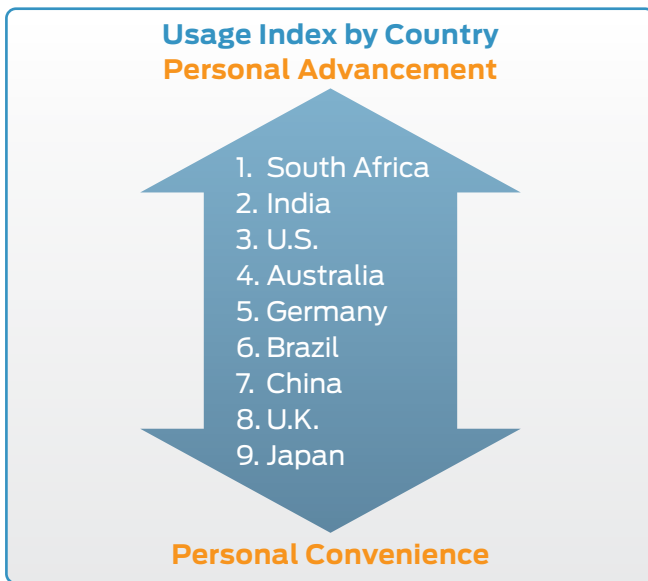
Education is a good example of how people in developing countries are more likely to utilize the power of connectivity to help them get ahead – people in developing countries are nearly twice as likely to use connected devices for educational purposes on a regular basis (24 percent) as those in developed markets (12 percent). Professional development shows a large gap at 46 percent vs. 27 percent.

In developed nations, on the other hand, people are more likely to use connected devices for practical day-to-day activities like:

- Banking (51%)
- Shopping (41%)
- Searching for local information (42%)

We've developed a scale to illustrate how likely people in the countries surveyed are to use connectivity for personal advancement or for tasks that enhance their personal convenience.

South Africa, which ranks first among all nine nations for professional and social usage, second for education and last for commerce, sits at one end of the spectrum. Japan, first for commerce and searching for local information and last for education, sits at the opposite end.



Some other data points stand out in the survey. For example, Brazil is number one for educational use and it ranks first in time spent on a mobile device per day at six hours, nearly three times the rate of Japan, Australia, and the U.K. Although it is first for commerce, Japan ranks last for banking.

Roadblocks and Missed Opportunities

People in emerging markets may be making the most of lower bandwidth connectivity, but they are also well aware that their networks limit the positive impact that connectivity can have, particularly in their professional lives.

The survey found that people in emerging markets were more than twice as likely to report that they have missed out on a professional opportunity compared to their counterparts in developed markets.

The survey also found that consumers in developing countries believe that network issues prevent them from doing more with their mobile devices.

Network speed, network capacity, mobile device quality and the ability to find a connection are all about twice as likely to be cited as issues by people in developing nations as they are in developed countries.

- Overall, connection speed, which was cited by 60 percent of consumers in emerging markets, is the most common problem (compared with 27 percent in developed countries).
- Simply finding a connection remains an issue in developing countries: it was cited by nearly 30 percent of emerging market respondents, compared to just 13 percent in developed nations.

An issue that elicited a similar response was security, where the gap was just 13 percentage points.

The Satisfaction Conundrum

Given that people in emerging markets struggle with the limits of lower bandwidth connections and are more likely to have missed important work opportunities because of issues with network speed and reliability, one surprising result of the Juniper Networks Global Broadband Index is that consumers in developing countries are more satisfied with their connectivity than their counterparts in developed countries.

This conclusion is based on a Satisfaction Index that was created by aggregating responses to questions designed to uncover consumer attitudes about their current connectivity. Countries earned points for things like quality of life improvements due to connectivity, and lost points for experiences such as missed professional opportunities due to a poor connection.

The Index reveals that there are high levels of satisfaction in the emerging countries – all give a passing grade to their connectivity. In developed countries, on the other hand, network quality and reliability did not pass the test.

Connectivity Satisfaction Index by Country

Emerging Markets

India	A+
South Africa	B
Brazil	C+
China	C

Developed Countries

U.S.	D
Australia	D
Germany	D
U.K	F
Japan	F

It is likely that the belief in the developing world that connectivity is transforming people's lives is still much stronger than the feeling that networks should be faster and more reliable. Meanwhile, in the developed world, high bandwidth connectivity is so commonplace that people are much more sensitive to interruptions in service.

Future Expectations

An important goal of the Juniper Network Global Bandwidth Index is to get a sense not just of how people use connectivity today, but how they hope to use it in the future. The survey found similarities and differences between consumers in emerging markets and consumers in developed countries.

One similarity is that both groups want their connected devices to work more proactively on their behalf. For example, the ability to receive intelligent push notifications ranks in the top three desired future uses in developed and developing countries.

Another similarity is that a significant majority of those surveyed in both categories would like to have access to more and better mobile connectivity on public transportation – 85 percent in developing countries and 63 percent in developed nations.

85%



of people in developing countries would like better access to mobile connectivity on public transportation.

There is one important difference that reflects the way the two groups use connectivity now. More than half of consumers in emerging countries would like to have more access to educational resources compared to less than one-quarter in developed countries.

And while the demand for significant improvements in connectivity over the next three to five years is stronger in emerging markets (97 percent) than it is in developed countries (74 percent), it is clear that the overwhelming expectation in both groups is that progress is inevitable.

Top Connectivity Goals

Emerging Markets

1. Information from other “smart” devices, for example home security notifications **59%**
2. Intelligent push notifications, for example proactive notifications about traffic or weather **58%**
3. Better access to online education and resources **58%**

Developed Markets

1. Intelligent push notifications, for example proactive notifications about traffic or weather **37%**
2. Managing other technologies from a mobile device, for example turning on a light **33%**
3. Access to more location based services **32%**

Implications for Service Providers

The Juniper Networks Global Bandwidth Index found that mobile connectivity has had a profound impact on how people communicate, work, learn and play around the world. And it suggests that this transformation will continue as new technologies emerge, network speeds increase and hundreds of millions of people who aren't yet connected to the Internet gain access.

So what does this mean for service providers that deliver network connectivity to mobile consumers in fast-changing markets around the world?

Personalization: The Juniper Global Bandwidth Index underscores that not all people want the same things, use the same services or have the same expectations. Connections and experiences are very personal. With significant differences between emerging and developed markets as well as person to person, service providers will need to continue to offer new and differentiated services and support that can intelligently adjust to the ever-evolving ways that their customers use bandwidth.

And while connectivity is incredibly important, it does not always equate to satisfied customers. Which means service providers will be increasingly called upon to offer the applications that enable their customers to accomplish what they want to in both their personal and professional lives.

Innovative Infrastructure: With perhaps the biggest potential for personal and economic development in emerging markets, service providers will need to creatively innovate with technology to tackle major infrastructure challenges. Service providers also have an opportunity to close the gap between emerging and developed markets. Virtualization delivers more capacity and elasticity which allows them to scale up and down, as well as take more risks without fear of losing money in big investments. They can better grow in line with profitability.

To learn more about how Juniper is helping service providers meet these demands with High-IQ Networks, visit www.juniper.net.

References

¹ According to the International Telecommunications Union, the United Nations information and communications technology agency.

ⁱⁱ The Juniper Networks Global Bandwidth Index was conducted by Wakefield Research among adults with smartphones and/or internet access in the home, with at least 500 interviews in each of the following countries: Australia, Brazil, China, India,

Japan, South Africa, United States, and 1,000 in both the United Kingdom and Germany, between June 2nd and June 16th, 2014, using an email invitation and an online survey. Results of any sample are subject to sampling variation. The magnitude of the variation is measurable and is affected by the number of interviews and the level of the percentages expressing the results. For the interviews conducted in this particular study, the chances are 95 in 100 that a survey result does not vary, plus or minus, by more than 4.4 percentage points among audiences of 500, and 3.1 percentage points among audiences of 1,000, from the result that would be obtained if interviews had been conducted with all persons in the universe represented by the sample.

ⁱⁱⁱ According to the United Nations: http://www2.ohchr.org/english/bodies/hrcouncil/docs/17session/A.HRC.17.27_en.pdf

About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at www.juniper.net.

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