akamai's [state of the internet]

Q2 2016 report

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Ever since launching the *State of the Internet Report* in 2008, we've been publishing connectivity-related data derived from the Akamai Intelligent Platform[™] as well as related data sets from Akamai or other third-party sources. However, we've never given any explicit guidance on how the data should be used. There's no single right answer there, obviously, as it depends on the requirements and goals of each specific reader.

Over time, connection speed data from the report has been used as a de facto benchmark in press outlets around the world, most often in the context of local broadband or mobile initiatives. It is employed as a means of comparing local speeds to other geographic neighbors (states or countries) or supporting calls for additional investment or competition in the local markets.

Some of Akamai's media customers have also found data from the report useful for informing decisions on new markets for expansion as well as determining appropriate content encoding bitrates for these new markets. By identifying geographies with strong broadband capabilities, they can not only avoid entering markets where their streaming services would fare poorly, but also encode their content at optimal bitrates to ensure high quality user experiences.

In addition, the academic research community and industry analyst firms have found the *State of the Internet Report* to be a rich source of data that can serve as critical input for the development of 'digital readiness' indices, Internet maturity rankings, and other unique perspectives.

Maybe these examples have prompted you to think more about how you can leverage *State* of the Internet data for your own use case. Remember that the report goes beyond detailing connections speeds as well, presenting data about IPv4 exhaustion and IPv6 adoption, mobile browser usage, and Internet outages, all of which can be used for planning and development purposes. The *State of the Internet* team also considers how we can evolve beyond simply reporting on connection speed data to providing insightful perspectives on it, i.e., the "why's and how's" of short-term changes and long-term trends as well as the broader impact of those changes and trends. We look forward to sharing those perspectives with you in the future.

As we noted in previous quarters, for readers who want to consume the *State of the Internet Report* on a tablet or e-reader device, we are now making the report available for download in ePub format from online bookstores including *amazon.com*, *Google Play*, *Apple iBooks*, *Barnes & Noble*, and *Kobo*. Specific download links are available after registration at *https:// www.akamai.com/stateoftheinternet/*, and we encourage you to leave positive reviews of the report at your online bookstore of choice.

As always, if you have comments, questions, or suggestions regarding the *State of the Internet Report*, the website, or the mobile applications, please reach out to us via email at *stateoftheinternet@akamai.com* or on Twitter at *@akamai_soti*. You can also interact with us in the *State of the Internet* subspace on the Akamai Community at *https://community.akamai.com/*.

—David Belson

3 [EXECUTIVE SUMMARY]

5 [SECTION]¹ = INTERNET PENETRATION

- 6 1.1 / Unique IPv4 Addresses
- 6 1.2 / IPv4 Exhaustion
- 8 1.3 / IPv6 Adoption

11 [SECTION]² = GEOGRAPHY (GLOBAL)

- 12 2.1 / Global Average Connection Speeds (IPv4)
- 12 2.2 / Global Average Peak Connection Speeds (IPv4)
- 13 2.3 / Global 4 Mbps Broadband Adoption (IPv4)
- 14 2.4 / Global 10 Mbps Broadband Adoption (IPv4)
- 14 2.5 / Global 15 Mbps Broadband Adoption (IPv4)
- 15 2.6 / Global 25 Mbps Broadband Adoption (IPv4)

17 [SECTION]³ = GEOGRAPHY (UNITED STATES)

- 17 3.1 / United States Average Connection Speeds (IPv4)
- 18 3.2 / United States Average Peak Connection Speeds (IPv4)
- 19 3.3 / United States 4 Mbps Broadband Adoption (IPv4)
- 20 3.4 / United States 10 Mbps Broadband Adoption (IPv4)
- 20 3.5 / United States 15 Mbps Broadband Adoption (IPv4)
- 21 3.6 / United States 25 Mbps Broadband Adoption (IPv4)

23 [SECTION]⁴ = GEOGRAPHY (AMERICAS)

- 23 4.1 / Americas Average Connection Speeds (IPv4)
- 24 4.2 / Americas Average Peak Connection Speeds (IPv4)
- 24 4.3 / Americas 4 Mbps Broadband Adoption (IPv4)
- 25 4.4 / Americas 10 Mbps Broadband Adoption (IPv4)
- 25 4.5 / Americas 15 Mbps Broadband Adoption (IPv4)

27 [SECTION]⁵ = GEOGRAPHY (ASIA PACIFIC)

- 27 5.1 / Asia Pacific Average Connection Speeds (IPv4)
- 28 5.2 / Asia Pacific Average Peak Connection Speeds (IPv4)
- 28 5.3 / Asia Pacific 4 Mbps Broadband Adoption (IPv4)
- 29 5.4 / Asia Pacific 10 Mbps Broadband Adoption (IPv4)
- 29 5.5 / Asia Pacific 15 Mbps Broadband Adoption (IPv4)

33 [SECTION]⁶ = GEOGRAPHY (EUROPE)

- 33 6.1 / European Average Connection Speeds (IPv4)
- 34 6.2 / European Average Peak Connection Speeds (IPv4)
- 34 6.3 / European 4 Mbps Broadband Adoption (IPv4)
- 35 6.4 / European 10 Mbps Broadband Adoption (IPv4)
- 36 6.5 / European 15 Mbps Broadband Adoption (IPv4)

39 [SECTION]⁷ = GEOGRAPHY (MIDDLE EAST + AFRICA)

- 39 7.1 / MEA Average Connection Speeds (IPv4)
- 40 7.2 / MEA Average Peak Connection Speeds (IPv4)
- 40 7.3 / MEA 4 Mbps Broadband Adoption (IPv4)
- 41 7.4 / MEA 10 Mbps Broadband Adoption (IPv4)
- 41 7.5 / MEA 15 Mbps Broadband Adoption (IPv4)

45 [SECTION]⁸ = MOBILE CONNECTIVITY

- 45 8.1 / Connection Speeds on Mobile Networks
- 46 8.2 / Mobile Browser Usage Data
- 49 8.3 / Mobile Traffic Growth Ovserved by Ericsson
- 51 [SECTION]⁹ = SITUATIONAL PERFORMANCE

55 [SECTION]¹⁰ = INTERNET DISRUPTIONS + EVENTS

- 55 10.1 / Iraq
- 57 10.2 / Syria
- 58 10.3 / Kenya

59 [SECTION]¹¹ = APPENDIX

61 [SECTION]¹² = ENDNOTES

This quarter's report includes data gathered from across the Akamai Intelligent Platform during the second quarter of 2016, covering Internet connection speeds and broadband adoption metrics across both fixed and mobile networks as well as trends seen in this data over time. In addition, the report includes insight into the state of IPv4 exhaustion and IPv6 adoption, Internet events and disruptions that occurred during the quarter, mobile browser usage trends, and observations from Akamai partner Ericsson regarding data and voice traffic growth on mobile networks.

Data on attack traffic seen across the Akamai platform and insights into high-profile security vulnerabilities and attacks are now published in a separate *State of the Internet/Security Report*. The quarterly security report provides timely information about the origins, tactics, types, and targets of cyberattacks, including quarterover-quarter and year-over-year attack traffic trends as well as case studies highlighting emerging cybersecurity issues. The *State of the Internet/Security Report* can be found at *https://www.akamai.com/ stateoftheinternet-security*.

INTERNET CONNECTIVITY / In the second quarter of 2016, Akamai observed a 1.0% quarterly decrease in the number of unique IPv4 addresses connecting to the Akamai Intelligent Platform, declining to just over 800 million—about 8 million fewer than in the first quarter. In all, roughly 4.3 million IPv4 addresses were allocated or assigned from available pools at the Regional Internet Registries in the second quarter, leaving approximately 50.5 million addresses remaining. Belgium remained the clear global leader in IPv6 adoption with 38% of its connections to Akamai happening over IPv6, up 5.1% from the previous quarter.

CONNECTION SPEEDS & BROADBAND ADOPTION / The global average connection speed decreased 2.3% quarter over quarter to 6.1 Mbps, while the global average peak connection speed increased 3.7% to 36.0 Mbps. At a country/region level, South Korea continued to have the highest average connection speed in the world at 27.0 Mbps, reflecting a 7.2% decline compared with the first quarter, while Singapore maintained its position as the country with the highest average peak connection speed at 157.3 Mbps after a 7.1% quarterly increase.

Globally, 4 Mbps broadband adoption was 76% in the second quarter, up 4.3% from the first quarter, with Andorra having with the highest level of adoption worldwide at 97% (followed closely by Malta and South Korea, also with 97% adoption rates). Globally, the 10 Mbps adoption rate grew 0.7% quarter over quarter to 35%, but the 15 Mbps and 25 Mbps adoption rates fell 0.8% and 2.1% respectively, to 21% and 8.3%. As it has for many quarters, South Korea continued to lead the world in the 10 Mbps, 15 Mbps, and 25 Mbps broadband tiers, with adoption rates of 79%, 63%, and 37% respectively, after moderate quarterly declines in adoption across all three tiers.

MOBILE / Average mobile connection speeds (aggregated at a country/region level) ranged from a high of 23.1 Mbps in the United Kingdom to a low of 2.2 Mbps in Venezuela in the second quarter of 2016, while average peak mobile connection speeds ranged from 172.8 Mbps in Germany to 16.1 Mbps in Bolivia. Based on traffic data collected by Ericsson, the volume of mobile data traffic grew by 11% over the previous quarter.

Analysis of Akamai 10 data collected during the second quarter from a sample of requests to the Akamai Intelligent Platform indicates that for traffic from mobile devices on cellular networks, Apple Mobile Safari accounted for roughly 32% of requests, while Android Webkit and Chrome Mobile (the two primary Android browser bases) together accounted for approximately 59% of requests. For traffic from mobile devices across all networks, Apple Mobile Safari was responsible for about 39% of requests, while Android Webkit and Chrome Mobile made up nearly 52% of requests.



[SECTION]¹ INTERNET PENETRATION

hrough its globally deployed Intelligent Platform, and by virtue of the nearly 3 trillion requests for web content that it serves on a daily basis, Akamai has unique visibility into levels of Internet penetration around the world. In the second quarter of 2016, over 800 million unique IPv4 addresses from 243 unique countries/ regions connected to the Akamai Intelligent Platform. This is a 0.4% decrease in the number of unique IPv4 addresses seen by Akamai as compared with the second quarter of 2015 and a 1% decrease from the number seen in the first quarter.

Akamai saw over 800 million unique IPv4 addresses, and we believe this count represents well over 1 billion web users. In some cases, multiple individuals may be represented by a single IPv4 address (or a small number of IPv4 addresses) due to the fact that they access the web through a firewall or proxy server. In other cases, individual users may have multiple IPv4 addresses associated with them due to their use of multiple connected devices. 1.1 UNIQUE IPv4 ADDRESSES / The number of unique IPv4 addresses worldwide connecting to Akamai decreased by about 8 million in the second quarter of 2016. This is in line with our expectation that the number of unique global IPv4 addresses seen by Akamai may continue to level off or decline modestly in the future, as carriers increase the availability of native IPv6 connectivity for subscribers and implement Carrier-Grade Network Address Translation (CGNAT) solutions more broadly in an effort to conserve limited IPv4 address space.

In the second quarter of 2016, half of the top 10 countries/regions saw modest quarterly drops in unique IPv4 address counts, while the other half saw modest gains, as seen in Figure 1. Decreases ranged from 0.5% in the United Kingdom to 3.7% in the United States, while increases ranged from 0.1% in Brazil to 2.4% in Germany. Across the world, approximately 45% of the countries/ regions saw a quarter-over-quarter increase in unique IPv4 address counts in the second quarter compared with approximately 60% in the first. Twenty-one countries/regions saw IPv4 address counts grow 10% or more, while twenty-seven saw counts decline 10% or more as compared with the previous quarter.

Year-over-year changes among the top 10 countries/regions were mixed as well, with half seeing increases while the other half saw IPv4 address counts drop. France posted the largest increase with a gain of 6.4%, while Russia had the smallest at 0.8%. Among the countries/regions to see a yearly decrease in unique IPv4 address counts, the United States again had the largest decline with a drop of 10%. The other four countries/regions had far smaller declines, ranging from 0.2% in the United Kingdom to 1.4% in India. As noted previously, the losses seen in these countries are not indicative of long-term declines in Internet usage but are more likely related to changes in IP address management/conservation practices and/or increased IPv6 adoption.

Globally, approximately two-thirds of the countries/regions surveyed had higher unique IPv4 address counts in the second quarter compared with one year ago. Yearly growth rates of 100% or more were seen in 12 countries/regions, although all of them had a relatively small number of unique IPv4 addresses — six of them had fewer than 2,000 — meaning small changes can result in deceptively large percentage shifts in these countries. In all, 26 countries saw yearly growth rates of at least 50%, while 3 countries saw IPv4 address counts decline at least 50%. These numbers are similar to those seen in the preceding quarter.

1.2 IPv4 EXHAUSTION / As expected, in the second quarter of 2016, available IPv4 address space continued to decrease as Regional Internet Registries (RIRs) assigned and allocated blocks of IPv4 address space to organizations within their respective territories. A reference table translating the /nn notations used below to identify unique IP address counts can be found at *https://www.arin.net/knowledge/cidr.pdf*.

Leveraging data¹ collected by Geoff Huston, Chief Scientist at APNIC,² the *State of the Internet Report* provides a perspective on the size of the available IPv4 address pool at each RIR and how the sizes of the available pools have been shrinking over time. In addition, the report uses data provided by the individual RIRs to highlight IPv4 address space delegation activity within each region over the course of the quarter.

Figure 2 illustrates how the size of available IPv4 address pools at each RIR changed during the second quarter of 2016 based on data made available by Mr. Huston. As noted in the *Third Quarter*, 2015 *State of the Internet Report*, ARIN fully depleted its pool of available addresses after allocating its final IPv4 address block on September 24, 2015. Its reported available pool has remained at zero since then. LACNIC handed out nearly 640,000 addresses, or more than onethird of the pool it had available at the beginning of the quarter — a marked increase over the first quarter. AFRINIC distributed more than 1.7 million addresses, or about 6% of its available pool and roughly one-third of the number it handed out in the first quarter, while APNIC distributed about 1.1 million addresses — roughly double the number given in the first quarter — representing 11% of its available pool. Finally, RIPE handed out about 830,000 addresses, or 5% of its pool, similar to its first-quarter numbers.

	Country/Region	Q2 2016 Unique IPv4 Addresses	QoQ Change	YoY Change
-	Global	800,358,051	-1.0%	-0.4%
1	United States	134,931,550	-3.7%	-10%
2	China	124,530,875	-1.6%	-0.5%
3	Brazil	48,400,932	0.1%	5.4%
4	Japan	45,466,153	-0.7%	-0.3%
5	Germany	37,210,519	2.4%	3.8%
6	France	31,014,271	2.0%	6.4%
7	United Kingdom	30,941,963	-0.5%	-0.2%
8	South Korea	24,768,294	1.1%	6.1%
9	Russia	18,889,407	-3.0%	0.8%
10	India	17,353,922	2.0%	-1.4%

Figure 1: Unique IPv4 Addresses Seen by Akamai

With just under 26.5 million addresses available at the end of the second quarter, AFRINIC was the RIR with the most substantial pool of IPv4 addresses remaining. At the end of the second quarter, RIPE and APNIC had roughly 14.7 million and 8.2 million available IPv4 addresses respectively, and LACNIC, with the smallest remaining pool, had just under 1.2 million available addresses remaining.

With the number of available IPv4 addresses dwindling, in the second quarter an Internet Engineering Task Force (IETF) proposal was put forward to declare the IPv4 protocol specification "Historic".³ As Huston explains, a specification is labeled "Historic" when it has been "superseded by a more recent specification or is for any other reason considered to be obsolete". In this case, the IPv4 protocol specification has been superseded by the IPv6 protocol specification, and the IPv4 "Historic" declaration would underscore the IETF's commitment to pushing forward IPv6 adoption. On the other hand, the "Historic" label could also imply a standard is "Not Recommended", which would be inappropriate in the case of the still widely-in-use IPv4 protocol.⁴ As such, the proposal was still under debate at the time this report was written (August 2016).

Figure 3 illustrates the IPv4 allocation/assignment activity across each of the RIRs during the second quarter of 2016. Overall, there was a slight decrease in activity, as 7.1 million addresses were allocated/assigned in the second quarter compared with 9.0 million in the first quarter. As mentioned in previous *State of the Internet Reports*, as available address pools dwindle, sizeable portions of these transactions—including ARIN's assignment/allocation of 2 million addresses—are likely to have been third-party transfers instead of direct RIR allocations. Interestingly, RIPE has studied IPv4 transfers within its service region over the last couple of years and has seen a decrease in activity over the past year, primarily





due to a change in policy implemented in July 2015 that prevented transfers from taking place within the first 24 months of receiving a RIPE allocation, as this was felt to be "in conflict with the spirit of the allocation policy".⁵ On the other hand, on June 1, ARIN retired its IPv4 Countdown Plan specifying special review procedures in the allocation of IPv4 requests. ARIN noted that moving forward, requests would be handled under normal processes, allowing resources to be directed towards other needs, such as the rising number of IPv4 transfers.⁶

In the second quarter, the most significant transaction at ARIN occurred on April 15, when two /14's and several smaller IPv4 address blocks - totaling over a million addresses - were assigned to Chinese e-commerce company Alibaba.com.7 Alibaba had a transaction of a similar size on March 17, and, as noted in last quarter's State of the Internet Report, while the transactions appear to be an ARIN assignment, they are most likely IP address block transfers between third-party companies. When a thirdparty address block transfer takes place, the source organization's resources are first returned to ARIN and then, within hours, reissued to the recipient organization. The newly assigned IPv4 addresses get captured in the data used to generate Figure 3 but do not show up in ARIN's available pool (i.e., the data used to generate Figure 2). As available IPv4 address space becomes scarce and transfers become more frequent, we expect to see this phenomenon more often and possibly at other RIRs as well.

AFRINIC's largest allocation in the second quarter occurred on April 26, when Telecom Algeria received a /12.⁸ Other than this transaction, AFRINIC, APNIC, RIPE, and LACNIC all saw slow, consistent delegation activity in the second quarter, much like the first, with no specific days seeing assignments or allocations larger than a /15.

1.3 IPv6 ADOPTION / Starting with the *Third Quarter*, 2013 State of the Internet Report, Akamai began including insight into IPv6 adoption based on data gathered from the Akamai Intelligent Platform. The traffic percentages cited in Figure 4 and Figure 5 are calculated by dividing the number of content requests made to Akamai over IPv6 by the total number of requests made to Akamai (over both IPv4 and IPv6) for customer web properties

	Country/Region	Q2 2016 IPv6 %	QoQ Change
1	Belgium	38%	5.1%
2	Greece	25%	9.4%
3	Germany	22%	4.3%
4	Switzerland	21%	1.8%
5	United States	19%	13%
6	Portugal	19%	-8.6%
7	Ecuador	17%	35%
8	Estonia	14%	15%
9	Peru	13%	70%
10	France	11%	20%

Figure 4: IPv6 Traffic Percentage, Top Countries/Regions

that have enabled Akamai edge delivery via IPv6-in other words, for dual-stacked hostnames. This reporting methodology provides something of a lower bound for IPv6 adoption, as some dualstacked clients-such as Safari on Mac os x Lion and Mountain Lion - will only use IPv6 for a portion of possible requests. While new versions of Mac os x have addressed this issue, we are now finding that lack of IPv6 support in some consumer electronics (such as smart TVs and stand-alone digital media player devices) is presenting a barrier to growth in adoption, especially as the amount of content consumed on these devices grows over time. While not all of Akamai's customers have chosen to implement IPv6 delivery yet, the data set used for this section includes traffic from a number of leading web properties and software providers, so we believe it is sufficiently representative. Note that in compiling the data for the figures in this section, a minimum of 90 million total requests to Akamai during the second quarter was required to qualify for inclusion.

A regularly updated view into the metrics discussed below can be found in the "IPv6 Adoption Trends by Country and Network" visualization on the *State of the Internet* website at *https://www. akamai.com/us/en/our-thinking/state-of-the-internet-report/stateof-the-internet-ipv6-adoption-visualization.jsp.*

Figure 4 highlights the 10 countries/regions with the largest percentage of content requests made to Akamai over IPv6 in the second quarter. With a 5.1% quarter-over-quarter increase in IPv6

Country/Region Network Provider		Q2 2016 IPv6 %
United States	Comcast Cable	46%
United States	AT&T	43%
United States	Time Warner Cable	21%
United States	Verizon Wireless	74%
United States	Cox Communications	24%
Brazil	Global Village Telecom	19%
United Kingdom	Sky Broadband	56%
United States	T-Mobile	61%
Germany	Deutsche Telekom	29%
Pan-European	Liberty Global B.V. (UPC)	19%
Brazil	NET Serviços de Comunicação S.A.	10%
Ecuador	CNT Ecuador	41%
France	Orange	15%
Canada	Telus Communications	43%
Japan	KDDI Corporation	33%
Australia	Telstra Direct	6.5%
France	Proxad/Free	25%
Germany	Kabel Deutschland	52%
Belgium	TELENET	54%
United States	Sprint	20%

Figure 5: IPv6 Traffic Percentage, Top Network Providers by IPv6 Request Volume adoption, Belgium again maintained a clear global lead, as 38% of its content requests to Akamai were made over IPv6. Portugal was the only country in the top 10 to see a quarterly decline, posting an 8.6% drop compared with the first quarter. The remaining countries in the top 10 all saw IPv6 adoption rise, with quarterly increases ranging from 1.8% in Switzerland to 70% in Peru. Peru's big gain allowed it to join the top 10 this quarter along with Estonia, which did not qualify for inclusion in the first quarter because its request volume did not meet the minimum requirement.

Figure 5 lists the top 20 network providers ordered by the number of IPv6 requests made to Akamai during the second quarter. Once again, cable and wireless/mobile providers continued to drive the largest volumes of IPv6 requests, as many are leading the way for IPv6 adoption in their respective countries. Notably, in a trend that is likely to pick up among mobile providers, u.s. provider T-Mobile has rolled out an IPv6-only network for Android — an architecture that has the potential to offer better end-user performance, based on data gathered by Akamai.⁹

In the second quarter, Verizon Wireless again led the pack with 74% of its requests to Akamai being made over IPv6, up from 68% in the first quarter, followed by T-Mobile with 61% of requests. In the second quarter, 12 providers in the top 20 had at least one in four requests for dual-stacked content to Akamai take place over IPv6 — up from eight providers in the preceding quarter. Nineteen of the top 20 — up from 16 in the previous quarter — had at least 10% of requests to Akamai occur over IPv6. These increases all point to the continued advancement of IPv6 adoption, a trend that appears to be accelerating. The World IPv6 Launch blog notes that more than 12% of users now access Google services over IPv6, compared with less than 1% four years ago.¹⁰



[SECTION]² GEOGRAPHY *GLOBAL*

The data presented within this section was collected during the second quarter of 2016 through Akamai's globally deployed Intelligent Platform and includes all countries/regions that had more than 25,000 unique IPv4 addresses request content from Akamai during the second quarter. This report features data on average and average peak connection speeds - the latter provides insight into the peak speeds that users can likely expect from their Internet connections. In addition, it also provides insight into adoption levels at different broadband threshold speeds. References to broadband tiers throughout this report refer to speeds greater than or equal to the specified threshold. In order to qualify for inclusion in a speed tier, a country or region must have more than 25,000 unique IPv4 addresses that meet the given speed threshold. Note that connection speeds published within the State of the Internet Report are guidance based on the reach of Akamai's platform. See the blog post at http://akamai.me/sotimetrics for more information on how these metrics are calculated.

Traffic from known mobile networks is analyzed and reviewed in *Section 8* of the report. Therefore, mobile network data has been removed from the data set used to calculate the metrics in the present section as well as subsequent regional "Geography" sections. However, a small number of networks offer both fixed and mobile broadband service, and in some cases it may not be possible to accurately separate the two types of traffic within that network. This may result in the inclusion of some data in this section that is based on connections from mobile devices and/or mobile gateways. In the vast majority of cases, we do not expect this data to have a significant bearing on the results presented below, but in a few instances, the speeds presented may be substantively affected, and we will note those instances where we feel this may be the case.

Beginning with the Second Quarter, 2015 State of the Internet Report, we have also removed traffic identified as coming from major cloud hosting providers, as cloud-services data centers typically have extremely fast Internet connections that can skew connection speed metrics. We believe that removing this data from our calculations provides a more accurate picture of the end-user experience.

Finally, note that some countries, such as Luxembourg, have chosen to roll out new high-speed broadband services using native IPv6 connectivity, and as such, this section may under-report the connection speeds available to, and achieved by, broadband subscribers within these countries, as this section is restricted to IPv4 addresses only.

2.1 GLOBAL AVERAGE CONNECTION SPEEDS (IPv4) / In the second quarter of 2016, the global average connection speed was 6.1 Mbps, a 2.3% decrease from the first quarter. Unlike the previous quarter, where all of the top 10 countries/regions saw gains in average connection speed, in the second quarter, 9 of the top 10 countries/regions saw speeds decrease, as shown in Figure 6. Singapore was the only country/region with a quarterly increase. Its average connection speed rose 4.5%, pushing it into the top 10 in the second quarter along with Iceland, while the Netherlands and the Czech Republic, with quarterly decreases of 5.2% and 7.0% respectively, dropped out of the top 10.

Sweden saw the largest quarterly decrease at 8.8%, followed by South Korea, although the latter maintained its global lead despite its 7.2% drop to 27.0 Mbps. The remaining countries/regions saw quarter-over-quarter drops ranging from 0.6% in Finland to 5.8% in Norway. Once again, average connection speeds among the top 10 countries/regions were all above 15 Mbps, while South Korea was the only country/region with an average connection speed above 25 Mbps.

Globally, 53 out of 148 qualifying countries/regions saw quarterly increases in average connection speeds, compared with 142 countries/regions in the first quarter. Growth rates ranged from a

	Country/Region	Q2 2016 Avg. Mbps	QoQ Change	YoY Change
-	Global	6.1	-2.3%	14%
1	South Korea	27.0	-7.2%	17%
2	Norway	20.1	-5.8%	55%
3	Hong Kong	19.5	-1.9%	15%
4	Sweden	18.8	-8.8%	19%
5	Switzerland	18.3	-1.9%	17%
6	Finland	17.6	-0.6%	26%
7	Latvia	17.5	-4.5%	23%
8	Singapore	17.2	4.5%	27%
9	Japan	17.1	-5.7%	5.1%
10	Iceland	17.0	-2.6%	49%

Figure 6: Average Connection Speed (IPv4) by Country/Region

modest 0.4% in the United Kingdom (to 15.0 Mbps) to a substantial 64% in Egypt (to 4.0 Mbps). Thirteen countries/regions enjoyed double-digit gains. Quarter-over-quarter losses were seen in 95 qualifying countries/regions, compared with just four countries/ regions in the first quarter. Declines in connection speeds ranged from 0.1% in Mauritius (to 5.6 Mbps) to 34% in Nepal (to 2.5 Mbps).

Year over year, all of the top 10 countries/regions saw increases in the second quarter of 2016, just like the first quarter. Gains were slightly more modest, ranging from 5.1% in Japan to 55% in Norway. On a global basis, the average connection speed increased 14% year over year in the second quarter of 2016. Average connection speed improvements were seen in 132 qualifying countries, compared with 138 in the preceding quarter, and yearly increases ranged from 0.9% in Nigeria (to 2.9 Mbps) to 297% in Kenya (to 7.7 Mbps). Five additional countries also saw average connection speeds more than double from the prior year. Yearly declines were seen in 16 countries/regions, with drops ranging from 0.8% in Lebanon (to 1.8 Mbps) to 35% in Côte d'Ivoire (to 1.6 Mbps).

Yemen, with an average connection speed of 0.7 Mbps (down 21% from the previous quarter), was the only country to have an average speed below 1.0 Mbps in the second quarter. Libya, the other country below 1.0 Mbps in the first quarter, saw a 43% quarterly increase to just reach the 1.0 Mbps threshold in the second quarter.

2.2 GLOBAL AVERAGE PEAK CONNECTION SPEEDS (IPv4) / Continuing its upward trend from the previous quarters, the global average peak connection speed increased 3.7% to 36.0 Mbps in the second quarter of 2016, as shown in Figure 7. With the exception of Indonesia, which saw a 17% quarter-over-quarter drop in average peak connection speed (after seeing a large 38% increase in the previous quarter), the countries/regions in the top 10 all posted quarterly gains. Bahrain posted the largest increase at 32%, a gain that propelled it from the 13th spot globally in the first quarter to the fourth spot in the second. However, data for Bahrain may be affected by the fact that a large network provider offers both fixed and mobile broadband, resulting in the possible inclusion of some

	Country/Region	Q2 2016 Peak Mbps	QoQ Change	YoY Change
-	Global	36.0	3.7%	2.5%
1	Singapore	157.3	7.1%	44%
2	Hong Kong	114.3	3.6%	21%
3	South Korea	110.1	6.3%	33%
4	Bahrain	100.9	32%	-12%
5	Qatar	97.8	9.6%	36%
6	Macao	94.5	10%	51%
7	Indonesia	91.9	-17%	355%
8	Taiwan	88.8	6.9%	23%
9	Japan	85.3	0.9%	14%
10	Romania	84.2	2.2%	22%

Figure 7: Average Peak Connection Speed (IPv4) by Country/Region

mobile connections in Bahrain's speed calculations (as noted in the introduction to Section 2). In this particular case, the speeds shown here may be impacted by mobile gateways connecting to Akamai servers—typically via very high-speed connections—and may not be fully indicative of end-user fixed broadband experiences. Japan posted the smallest increase among the top 10 at 0.9%. With a 7.1% gain in the second quarter, Singapore retained its position as the country/region with the highest average peak connection speed at 157.3 Mbps, and, like the previous quarter, all of the top 10 qualifying countries/regions worldwide saw average peak speeds of at least 80 Mbps.

Looking across the world, 105 of the 148 qualifying countries/ regions saw quarterly increases in average peak connection speeds, compared with 123 in the previous quarter. Growth rates ranged from 0.4% in Paraguay (to 12.6 Mbps) to 127% in French Guiana (to 47.2 Mbps), with 34 countries posting double-digit growth. On the declining side, 43 qualifying countries/regions saw lower average peak connection speeds in the second quarter, compared with 23 in the preceding quarter. Declines ranged from 0.1% in Switzerland (to 76.1 Mbps) to 20% in Zambia (to 6.4 Mbps).

Year over year, average peak connection speeds increased just 2.5% on a global basis in the second quarter of 2016, compared with 14% in the prior quarter. All of the top 10 countries/regions saw increases in average peak connection speed with the exception of Bahrain, which saw a 12% decline. Among the gainers, Indonesia again led the pack with a 355% increase. As noted in the previous two quarters' reports, Indonesia's recent large gains in this and other broadband metrics are likely due in part to improved Akamai connectivity to a leading network provider within the country. Remaining increases among the top 10 ranged from 14% in Japan to 51% in Macao.

Across all of the qualifying countries/regions, a total of 124 saw yearly increases in average peak connection speeds, as compared with 135 in the preceding quarter. Growth ranged from a mere 0.4% in Kuwait (to 68.3 Mbps) to Indonesia's impressive 355%. Kenya, Réunion, and French Guiana also saw average peak connection speeds more than double compared with the previous year, while an additional 16 countries/regions saw speeds increase by at least 50%. Twenty-four countries/regions saw a yearly decline in average peak speeds, with Haiti again experiencing the largest drop at 67% (to 16.4 Mbps) and New Caledonia seeing the smallest at 0.2% (to 23.3 Mbps).

In the second quarter of 2016, Zambia was once again the country/ region with the lowest average peak connection speed (at 6.4 Mbps after a 20% quarterly drop), followed by Côte d'Ivoire (at 9.6 Mbps after a 7.6% quarterly gain). A total of three countries, all in Africa, saw average peak connection speeds below 10 Mbps in the second quarter, down from five countries in the previous quarter.

2.3 GLOBAL 4 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter of 2016, the global percentage of unique IPv4 addresses connecting to Akamai that met the 4 Mbps broadband

speed threshold increased by 4.3% to 76%. As shown in Figure 8, among the top 10 countries/regions, quarterly changes were small, with 4 out of the 10 showing gains. Andorra, which previously did not qualify for inclusion, led the world with a 97% adoption rate, closely followed by the remaining nine countries, all of which met the 4 Mbps average connection speed threshold for at least 95% of their unique IPv4 addresses connecting to Akamai—along with Bulgaria and Israel, the 11th and 12th place countries. Gains in the top 10 ranged from 0.1% in Thailand to 2.4% in Andorra, while declines ranged from 0.1% in Romania to 1.2% in Denmark.

Globally, a total of 119 countries/regions qualified for inclusion within this metric, up from 116 in the preceding quarter, but adoption growth was significantly weaker than in the first quarter. In total, 41 countries/regions saw quarterly growth in 4 Mbps broadband adoption rates, up from 109 in the previous quarter. Increases ranged from Thailand's 0.1% to Egypt's 101% (to 9.7% adoption). As noted the First Quarter, 2016 State of the Internet Report, Egypt's large increase was likely due in part to significant investments reportedly made by Telecom Egypt into local infrastructure and deployment as well as in submarine connectivity to the European Union. Ten countries posted double-digit growth in 4 Mbps broadband adoption rates in the second quarter. Quarterover-quarter declines were seen in 78 qualifying countries/regions, compared with 6 in the previous quarter. Decreases ranged from 0.1% in Romania to 52% in Nepal and Nigeria (to adoption rates of 18% and 14% respectively). Twenty-two countries/regions in all posted double-digit declines.

Year over year, the percentage of unique IPv4 addresses connecting to Akamai at average speeds of at least 4 Mbps increased by 21%, continuing the positive trend of the past few quarters. Adoption rates for 4 Mbps broadband were up on a yearly basis across all of the top 10 countries/regions in the second quarter but were again fairly modest, as can be expected with such high rates of adoption. Gains ranged from 0.7% in South Korea to 7.7% in Latvia.

	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
_	Global	76%	4.3%	21%
1	Andorra	97%	2.4%	3.8%
2	Malta	97%	-0.4%	4.9%
3	South Korea	97%	-0.5%	0.7%
4	Isle Of Man	96%	-0.3%	2.7%
5	Thailand	96%	0.1%	5.1%
6	Netherlands	96%	0.4%	2.4%
7	Latvia	95%	0.4%	7.7%
8	Romania	95%	-0.1%	6.4%
9	Switzerland	95%	-1.0%	1.6%
10	Denmark	95%	-1.2%	1.4%

Figure 8: 4 Mbps Broadband Adoption (IPv4) by Country/Region

Across the globe, 104 of the qualifying countries/regions saw 4 Mbps broadband adoption levels increase year over year, compared with 112 in the prior quarter. Growth rates ranged from a mere 0.3% in Israel to an incredible 1,585% in Kenya (to 64% adoption). Indonesia again saw the second-largest annual increase at 672% (to 66% adoption), while 21 additional countries/regions posted 4 Mbps adoption-rate gains of 100% or more. Barbados, with its 63% adoption rate, held steady compared with one year prior, while 14 countries/regions saw adoption rates fall. Declines ranged from 0.4% in Colombia (to 49% adoption) to 75% in Iraq (to 16% adoption), although Iraq had a fairly small number of unique IPv4 addresses connecting to Akamai (just over the qualifying threshold) and thus would likely experience larger percentage swings.

In the second quarter of 2016, Venezuela, Pakistan, and Algeria were again the only three countries with 4 Mbps broadband adoption rates below 5%. After enjoying large gains in the first quarter, each of these countries saw sizeable quarterly declines in the second, dropping 22%, 40%, and 47% to adoption levels of 3.4%, 2.9%, and 2.6% respectively.

2.4 GLOBAL 10 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter of 2016, 35% of unique IPv4 addresses globally connected to Akamai at average speeds above 10 Mbps, a 0.7% quarter-over-quarter increase, as shown in Figure 9. Unlike the previous quarter, where all of the top 10 countries/regions saw increases in adoption, in the second quarter only 2 of the top 10 experienced gains. Both gains were small, with Iceland posting a 1.1% increase and Singapore posting a 3.2% gain. Though it suffered a 5.3% decline compared with the previous quarter, South Korea remained the world leader with an adoption rate of 79% - 12 percentage points higher than second-place Singapore. With a 14% quarterly gain, Iceland joined the top 10 in the second quarter, pushing Denmark out. Only 6 of the top 10 countries/regions enjoyed 10 Mbps adoption rates of at least 65%, down from all 10 in the previous quarter.

	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
_	Global	35%	0.7%	34%
1	South Korea	79%	-5.3%	7.1%
2	Singapore	67%	3.2%	34%
3	Iceland	66%	1.1%	86%
4	Hong Kong	66%	-0.3%	6.3%
5	Switzerland	65%	-5.0%	7.5%
6	Japan	65%	-1.1%	8.4%
7	Belgium	64%	-2.6%	37%
8	Norway	64%	-1.7%	60%
9	Bulgaria	64%	-3.1%	17%
10	Netherlands	63%	-6.2%	8.4%

Figure 9: 10 Mbps Broadband Adoption (IPv4) by Country/Region

Seventy-nine countries/regions qualified for this metric, down from 82 in the preceding quarter. Thirty-five countries posted gains in adoption, with increases varying widely in magnitude, from 0.4% in Slovenia (to 42% adoption) to 497% in Egypt (to 10% adoption). Four countries in total saw adoption rates more than double compared with the previous quarter, while an additional 17 posted double-digit gains. Among the 44 declining countries, quarterly losses ranged from 0.1% in Estonia (to 40% adoption) to 39% in Georgia (to 17% adoption). Nine countries suffered doubledigit losses.

Looking at year-over-year changes, there was a 34% increase globally in the percentage of unique IPv4 addresses connecting to Akamai at average speeds above 10 Mbps. Like the previous quarter, all of the top 10 countries/regions enjoyed yearly growth in adoption rates in the second quarter. These ranged from 6.3% in Hong Kong to 86% in Iceland. Yearly changes were positive across the globe as well, with the exception of Jamaica, where adoption rates stayed level with the first quarter at 19%. Growth rates varied wildly, with Argentina's 1.1% (to 7.6% adoption) being the smallest and Egypt's 10,117% (to 10% adoption) being the largest. However, note that many of the countries seeing outsized yearly gains-including Egypt, Kenya, Morocco, and Saudi Arabia-did not qualify for inclusion in this metric one year ago, as they had too few IPv4 addresses connecting to Akamai at threshold speeds. Thus, the year-over-year percentage changes here are based on prior-year numbers calculated from data sets that were likely too small to be informative and could easily result in disproportionately large percentage changes, although it is still very likely that there was strong growth in 10 Mbps adoption in these countries over the past year. In total, 29 qualifying countries saw their adoption rates more than double compared with one year prior, while an additional 40 posted double-digit gains.

With just 2.5% of its IPv4 addresses connecting to Akamai at average speeds of 10 Mbps or more, Morocco was the qualifying country with the lowest 10 Mbps broadband adoption rate in the second quarter, despite posting an 81% increase over the first quarter. Iran, which held the bottom spot in the first quarter, did not qualify for inclusion in the second. Thirteen countries in all had less than one in ten IPv4 addresses connecting to Akamai at average connection speeds of 10 Mbps or more.

2.5 GLOBAL 15 MBPS BROADBAND ADOPTION (IPv4) / As Figure 10 shows, 21% of unique IPv4 addresses globally connected to Akamai at average connection speeds of 15 Mbps or above in the second quarter of 2016, down 0.8% from the first quarter. Unlike the first quarter, when all of the top 10 countries/regions saw quarter-over-quarter gains, in the second quarter only Singapore and Romania saw adoption growth, posting increases of 4.4% and 1.3% respectively. The remaining eight countries' declines ranged from 0.2% in Iceland to 10% in Sweden. Despite a 9.0% quarterly decrease, South Korea remained solidly in the lead worldwide with a 15 Mbps broadband adoption rate of 63%, 15 percentage points above second-place Norway.

	Country/Region	% Above 15 Mbps	QoQ Change	YoY Change
-	Global	21%	-0.8%	54%
1	South Korea	63%	-9.0%	20%
2	Norway	48%	-3.7%	100%
3	Hong Kong	46%	-2.6%	16%
4	Singapore	45%	4.4%	68%
5	Switzerland	42%	-4.2%	24%
6	Romania	42%	1.3%	65%
7	Japan	42%	-4.5%	11%
8	Iceland	41%	-0.2%	187%
9	Latvia	41%	-3.5%	32%
10	Sweden	41%	-10%	24%

Figure 10: 15 Mbps Broadband Adoption (IPv4) by Country/Region

Sixty-nine countries/regions qualified for inclusion in this metric in the second quarter, up from 68 in the first. However, quarterly gains were only seen in 33 qualifying countries/regions compared with 66 in the prior quarter, and increases were smaller overall. The United Kingdom saw the smallest rate of growth at 0.4% (to 36% adoption), while Egypt and Qatar enjoyed the biggest increases at 597% and 229% (to adoption rates of 4.8% and 31% respectively). In total, seven countries/regions more than doubled their 15 Mbps adoption rates compared with the first quarter. On the declining side, losses ranged from 0.2% in Iceland to 50% in Georgia (to 6.2%). China again had the lowest 15 Mbps broadband adoption rate at 0.6%, despite a healthy 62% quarterly increase. Colombia was the only other qualifying country to have an adoption level below 1.0%, posting a 0.8% adoption rate, up 46% from the first quarter.

Year over year, the global 15 Mbps adoption rate grew a healthy 54%, with growth seen across the board among all qualifying countries. In the top 10, Iceland again had the largest yearly increase at 187%, followed by Norway at 100%. The remaining eight countries/ regions in the top 10 all posted double-digit gains, ranging from 11% in Japan to 68% in Singapore. Looking across all of the qualifying countries, yearly increases in the second quarter ranged from 6.6% in Uruguay (to 3.0% adoption) to an incredible 19,288% in Kenya (to 11% adoption). However, just as with the 10 Mbps metric, the countries with the largest gains-including Kenya, Egypt, and Saudi Arabia — did not qualify for inclusion in the 15 Mbps metric a year ago, so their yearly percentage-change calculations may overstate the magnitude of their actual gains. In all, 29 countries/ regions saw adoption levels more than double year over year in the second quarter-the same as in the first quarter-and an additional 21 countries/regions saw gains of at least 50%.

2.6 GLOBAL 25 MBPS BROADBAND ADOPTION (IPv4) / Globally, 8.3% of unique IPv4 addresses connected to Akamai at average connection speeds of at least 25 Mbps—a 2.1% decrease compared with the previous quarter, as shown in Figure 11. Unlike the preceding quarter, when all of the top 10 countries/regions enjoyed double-digit quarterly gains in adoption rates, in the second quarter only Singapore

	Country/Region	% Above 25 Mbps	QoQ Change	YoY Change
-	Global	8.3%	-2.1%	69%
1	South Korea	37%	-13%	26%
2	Norway	25%	-7.8%	172%
3	Hong Kong	22%	-4.4%	40%
4	Sweden	22%	-14%	51%
5	Latvia	19%	-9.5%	46%
6	Switzerland	18%	3.0%	61%
7	Finland	18%	-0.7%	70%
8	Singapore	17%	9.3%	115%
9	Japan	17%	-11%	7.4%
10	Denmark	16%	-8.1%	133%

Figure 11: 25 Mbps Broadband Adoption (IPv4) by Country/Region

and Switzerland saw growth, posting increases of 9.3% and 3.0% respectively. The other eight countries/regions had adoption rates drop anywhere from 0.7% (in Finland) to 14% (in Sweden). Despite South Korea's 13% quarterly decline, it retained its position well above the rest of the world with a 37% adoption rate, 12 percentage points above second-place Norway. In all, 13 countries/regions had 25 Mbps adoption rates of at least 15%, the same as in the previous quarter.

The second quarter of 2016 saw the number of countries/regions that qualified for inclusion in the 15 Mbps metric rise to 52 from 50. While in the previous quarter, all of the qualifying countries/regions saw strong quarterly gains in adoption, in the second quarter 27 of them saw losses, ranging from 0.7% in Finland and the United States (to adoption levels of 18% and 13% respectively) to 38% in Moldova (to an adoption level of 5.0%). On the gaining side, Belgium posted the smallest increase at 0.2% while Egypt posted the largest at 605%. Qatar, Thailand, and Belarus also saw adoption rates more than double compared with the first quarter, while the remaining quarterly gains were more modest.

Year over year, the global 25 Mbps broadband adoption rate increased by a sizeable 69%. Among the top 10, gains were strong but slightly more modest than in the first quarter, ranging from 7.4% in Japan to 172% in Norway. Yearly increases were robust across the remaining qualifying countries/regions as well, with only Moldova posting a yearly drop, as its adoption rate declined 12% compared with the second quarter of 2015. Once again, outsized gains were posted by Kenya and Egypt (jumping 25,493% and 11,713% respectively), but neither country qualified for inclusion one year ago, as both had fewer than 1,000 IPv4 addresses connecting to Akamai at average speeds of 25 Mbps or more. Clearly, both have seen tremendous growth in high-speed connections in the past year, but the year-overyear numbers calculated for these two countries may not be truly representative. In all, 29 qualifying countries saw adoption rates more than double, and an additional 21 enjoyed double-digit growth. Japan was the only country to see growth of less than 10% compared with the previous year.



[SECTION]³ GEOGRAPHY UNITED STATES

he metrics presented here for the United States are based on a subset of data used for Section 2 and are subject to the same thresholds and filters discussed within that section. The subset used for this section includes connections identified as coming from the United States, based on classification by Akamai's EdgeScapeTM geolocation tool. For the purposes of this section, the District of Columbia is treated as a state.

3.1 UNITED STATES AVERAGE CONNECTION SPEEDS (IPv4) / In the second quarter of 2016, average connection speeds among the top 10 states reversed the positive trend from the last few quarters with 7 of the 10 states showing quarterly declines, one remaining unchanged, and two showing small positive gains. As seen in Figure 12, the District of Columbia held on to the top spot in the country and posted the largest quarterly gain among the top 10 with an increase of 1.5% while Maryland posted the only other quarterly gain at 1.1%. Losses ranged from 0.7% in New Jersey to 7.8% in Delaware, while Virginia's average connection speed remained unchanged from the first quarter. Like

	State	Q2 2016 Avg. Mbps	QoQ Change	YoY Change
1	District Of Columbia	24.3	1.5%	47%
2	Rhode Island	19.6	-1.8%	28%
3	Delaware	19.5	-7.8%	16%
4	Massachusetts	19.0	-4.4%	24%
5	Utah	18.9	-4.2%	25%
6	Maryland	18.6	1.1%	37%
7	New Jersey	18.4	-0.7%	33%
8	Virginia	18.0	0%	-4.1%
9	New York	17.8	-1.4%	28%
10	Washington	17.2	-0.8%	11%

Figure 12: Average Connection Speed (IPv4) by State

the previous quarter, all 10 states had average connection speeds exceeding the 15 Mbps threshold, but none had average connection speeds reaching the FCC's new 25 Mbps broadband threshold, although the District of Columbia was just 0.7 Mbps shy.

Across the country, all 51 states once again saw average connection speeds above the 10 Mbps threshold in the second quarter of 2016. Idaho had the slowest speeds in the nation, connecting to Akamai at an average speed of 10.2 Mbps, down 6.4% from the previous quarter. Unlike the first quarter, when all 51 states saw average connection speeds rise, in the second quarter only 14 states saw quarterly gains. Increases ranged from 0.3% in Nebraska (to 13.9 Mbps) to 8.4% in New Mexico (to 12.4 Mbps). Two states, North Carolina (14.0 Mbps) and Virginia, remained unchanged, while 35 saw losses. Maine posted the largest decline at 11% (to 11.6 Mbps), while Montana and Texas posted the smallest at 0.1% (to 12.6 Mbps and 14.7 Mbps respectively).

On a year-over-year basis, Virginia was once again the only state to see a decline, as it posted a 4.1% loss in average connection speed. The remaining 50 states enjoyed gains, again led by the District of Columbia with a 47% increase. Wisconsin once again had the smallest yearly increase at 5.0%, while the remaining states all enjoyed double-digit gains, just like in the first quarter. Seven states saw gains of at least 30% compared with the preceding year.

3.2 UNITED STATES AVERAGE PEAK CONNECTION SPEEDS (IPv4)/ As seen in Figure 13, the District of Columbia held on to the top spot in the nation for average peak connection speeds in the second quarter with a 2.7% quarterly increase to 95.5 Mbps. Unlike the previous quarter where all of the top 10 states saw increases in average peak connection speeds, three states saw quarterly losses in the second quarter, ranging from 1.5% in Massachusetts to 7.5% in Delaware. The other seven states posted gains, Virginia's being the smallest at 0.8% and Maryland's the largest at 4.6%.

Across the nation, quarterly changes were also more mixed than in the first quarter. Nineteen states saw declines compared with just one in the previous quarter, as drops ranged from 0.1% in Montana (to 57.9 Mbps) to 9.7% in Maine (to 46.6 Mbps). West Virginia posted the smallest increase at 0.3% (to 54.1Mbps), while New Mexico — the only state with double-digit quarterly growth — had the largest gain at 12% (to 55.7 Mbps).

Like the preceding quarter, year-over-year changes were positive across all 51 states in the second quarter of 2016. At 5.6%, Virginia had the smallest increase in the nation (and the top 10), while North Carolina and Alaska had the largest gains at 44% (to 66.0 Mbps and 59.2 Mbps respectively). Maryland had the biggest increase among the top 10 at 40%. Fifty states in all enjoyed double-digit growth in average peak speeds compared with the second quarter of 2015.

In the second quarter of 2016, Arkansas held the spot for lowest average peak connection speed in the country at 46.3 Mbps, down 0.6% from the previous quarter. Kentucky, which held the bottom spot in the first quarter, enjoyed a 9.0% increase to 48.4 Mbps, boosting it up to 48th place in the nation. Mississippi and Maine held the 49th and 50th spots respectively, with speeds of 47.0 Mbps and 46.6 Mbps.

Continuing the trend of the past several quarters, U.S. telecommunications companies have remained active in deploying new gigabit services throughout the country. Comcast began consumer trials of its DOCSIS 3.1 cable-based gigabit service in Atlanta (in March) and Nashville (in June), with plans to offer the service in Chicago, Detroit, and Miami later in 2016.¹¹ Deployed over existing cable lines, Comcast's offering does not require new fiber build out. AT&T, which already offers its fiber-based gigabit-speed GigaPower service in 20 cities, announced expansions in the San Francisco and San Jose areas as well as southern Dallas — with plans to reach over 30 more metropolitan areas by the end the of the year.^{12, 13} AT&T also plans to bring the G.Fast technology to market this year, enabling speeds of 750 Mbps to 1.5 Gbps over existing phone and cable lines — a technology that could potentially be rolled out across the country within four years.¹⁴ Other second-

	State	Q2 2016 Peak Mbps	QoQ Change	YoY Change
1	District Of Columbia	95.5	2.7%	35%
2	Maryland	88.4	4.6%	40%
3	New Jersey	86.0	3.6%	34%
4	Virginia	85.6	0.8%	5.6%
5	Massachusetts	85.5	-1.5%	28%
6	Delaware	85.3	-7.5%	26%
7	Rhode Island	84.4	1.1%	29%
8	Washington	80.6	2.5%	20%
9	New York	79.2	1.2%	24%
10	Utah	78.9	-6.1%	29%

Figure 13: Average Peak Connection Speed (IPv4) by State

quarter service launch announcements include BendBroadband's 1 Gbps service in Redmond, OR;¹⁵ Ting's gigabit-speed service in Holly Springs, NC;¹⁶ Ellum.net's 10 Gbps service in South Dallas, TX;¹⁷ and Liberty Business's upcoming gigabit-speed offerings in rural Puerto Rico.¹⁸ Recon Analytics estimates that there are now nearly 1 million gigabit service users in the U.S..¹⁹

In addition to the commercial announcements, many state and local governments continued to push forward initiatives as well. In May, Minnesota approved a \$35 million budget for broadband funding in 2017.²⁰ The same month, Palo Alto, CA and Pikesville, KY put forth RFIs looking for service providers to partner with their towns to provide gigabit-speed access to every residence and business.²¹ In June, the smaller communities of Mount Washington, MA²² (population 150) and Egremont, MA²³ (population 1,000) also put out RFPs to bring municipally-supported broadband access to their rural towns. Likewise, Islesboro, a 14-mile-wide island off the coast of Maine with less than 600 year-round residents, voted to build a municipal fiber-based broadband that will provide gigabitspeed access for local homes and businesses.²⁴

3.3 UNITED STATES 4 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter of 2016, despite a 0.3% quarterly decline,

Rhode Island regained the top spot in the country for 4 Mbps broadband adoption, edging out first-quarter leader Delaware. Unlike the first quarter, when all of the top 10 saw gains in adoption, in the second quarter 8 of 10 states saw modest declines, ranging from 0.1% in Florida and New Jersey to 3.1% in Delaware, as seen in Figure 14. Maryland and the District of Columbia were the only states in the top 10 to see increases, as their adoption rates grew 0.2% and 0.1% respectively. Just as in the first quarter, all of the top 10 states had 4 Mbps adoption levels of 90% or more.

Nationwide, changes were more mixed than the preceding quarter, as 33 states posted declines compared with just one in the first quarter. Drops were very modest, ranging from 0.1% in Tennessee (88% adoption), Nevada (89% adoption), Florida, and New Jersey to 3.1% in Delaware. New Mexico saw the largest gain at 6.2% (to 81% adoption), while the remaining gainers saw increases of less than

	State	% Above 4 Mbps	QoQ Change	YoY Change
1	Rhode Island	96%	-0.3%	1.1%
2	Delaware	95%	-3.1%	-1.1%
3	New Jersey	94%	-0.1%	5.0%
4	Hawaii	93%	-0.8%	4.2%
5	Massachusetts	92%	-0.7%	4.6%
6	Maryland	91%	0.2%	16%
7	New York	91%	-0.6%	5.1%
8	Florida	91%	-0.1%	5.7%
9	North Dakota	90%	-2.3%	3.0%
10	District Of Columbia	90%	0.1%	19%

Figure 14: 4 Mbps Broadband Adoption (IPv4) by State

2%. Oklahoma, California, and Louisiana all saw adoption rates stay steady (at 80%, 88%, and 83% respectively) compared with the previous quarter.

Yearly changes were positive across 49 of the 51 states in the second quarter, compared with all 51 in the first quarter; Delaware and New Hampshire saw declines of 0.1% and 1.1% (to adoption rates of 86% and 95% respectively). Delaware was the only state in the top 10 with a decline, and the other nine saw year-over-year increases ranging from Rhode Island's 1.1% to the District of Columbia's 19%. Across the country, Missouri and Alaska tied the District of Columbia for the highest yearly increase (reaching adoption rates of 85% and 82% respectively), while Wisconsin posted the smallest gain at 0.5% to (82% adoption). Forty-five states had 4 Mbps broadband adoption rates of at least 80%, up from 44 states in the first quarter.

For the 11th consecutive quarter, West Virginia remained the state with the lowest 4 Mbps broadband adoption rate at 69% — down 0.8% quarter over quarter but up 12% year over year. Arkansas had the next-lowest adoption rate in the country at 75%, a 1.8% decrease from the first quarter but a 15% increase year over year.

In its continued efforts to expand broadband access to underserved areas across the country, the United States Federal Communications Commission (FCC) voted in May to provide an additional \$2.15 billion in funding (allotted as \$215 million per year for 10 years) to bring broadband service to rural areas of the U.S. The money will be distributed to telecommunications providers through a reverse auction mechanism, in which the providers must commit to providing access that meets various speed thresholds, with the lowest tier being 10 Mbps downstream (1 Mbps upstream) and a top tier aiming for downstream speeds of 1 Gbps (500 Mbps upstream).³⁵

Moreover, companies are developing new technologies to help bring broadband access to underserved communities more cheaply. In the second quarter, Facebook unveiled two projects — dubbed Terragraph and ARIES — that are aimed at bringing Internet access to different types of underserved communities.²⁶ Terragraph focuses on dense, congested urban areas by providing inexpensive and efficient wireless broadband service in cities where it is impractical or costly to add new fiber lines. San Jose, CA is expected to trial Terragraph later this year, offering free Wi-Fi to residents and visitors in the downtown area.²⁷ ARIES (Antenna Radio Integration for Efficiency in Spectrum) aims to provide broadband coverage to remote rural communities through more efficient use of the wireless spectrum. As mentioned in previous *State of the Internet* reports, Facebook has also been working on Aquila, a solar-powered plane that can provide Internet access from the sky.

Though no specifics have been announced, Google Fiber revealed it is also working on new wireless technologies to bring fast broadband coverage to less-dense residential areas where laying fiber is too costly due to the distance between homes.²⁸ Furthermore, in June, Google acquired Webpass, which offers high-speed wireless broadband solutions for dense urban areas.²⁹ **3.4 UNITED STATES 10 MBPS BROADBAND ADOPTION (IPv4)** / With an 8.1% quarterly decline in adoption, first-quarter leader Delaware dropped to third place in the nation for 10 Mbps broadband adoption in the second quarter. As seen in Figure 15, Rhode Island moved into the top spot with an adoption rate of 76%, followed by New Jersey with a 74% adoption rate, but both states saw declines — of 3.2% and 1.0% respectively — compared with the first quarter. Unlike the previous two quarters, when all of the top 10 states enjoyed quarter-over-quarter growth, in the second quarter only two states — Florida and Maryland — posted increases, gaining 3.9% and 0.2% respectively. Losses among the remaining eight states ranged from New Jersey's 1.0% to Delaware's 8.1%. Like last quarter, half of the top 10 states had at least 70% of their unique IPv4 addresses connecting to Akamai at average speeds above 10 Mbps.

Across the nation, 43 states saw adoption rates drop in the second quarter, giving back some of the gains from the previous quarter. Decreases ranged from 0.1% in Georgia (to 52% adoption) to 12% in Maine (to 45% adoption). The eight gaining states saw increases ranging from 0.1% in Oklahoma (to 47% adoption) to 10% in New Mexico (to 42% adoption). Thirty-seven states had at least half of their unique IPv4 addresses connecting to Akamai at average speeds of 10 Mbps or more, down from 40 states in the first quarter.

Year-over-year changes in 10 Mbps broadband adoption were positive across all 51 states, just as in the first quarter, as Hawaii again led the nation with a 77% jump (to 54% adoption), followed by Alaska with a 66% increase (to 43% adoption). The District of Columbia again posted the biggest increase among the top 10, enjoying a 34% yearly gain. Delaware saw the smallest increase among the country (and the top 10) at 6.8%, while all remaining top 10 states enjoyed double-digit gains compared with the second quarter of 2015. With a 6.9% quarterly decline in its 10 Mbps broadband adoption rate, in the second quarter of 2016 Idaho remained in last place across the country with a 34% adoption rate. Arkansas held the next-lowest spot with a 37% adoption rate.

3.5 UNITED STATES 15 MBPS BROADBAND ADOPTION (IPv4) / Just as with the 4 Mbps and 10 Mbps adoption metrics, Rhode Island took the top spot in the country for 15 Mbps broadband adoption in the second quarter, unseating first-quarter leader Delaware. As seen in Figure 16, both Rhode Island and Delaware saw quarterly declines in adoption, losing 5.3% and 12% respectively. In sharp contrast to the previous quarter where all of the top 10 states saw growth, in the second quarter only Maryland posted an increase, as its adoption rate grew a mere 0.1% quarter over quarter. Delaware had the largest loss among the top 10, and the other eight states saw decreases ranging from Virginia's 1.2% to Massachusetts's 6.6%. Four states maintained a 15 Mbps adoption level of at least 50%, compared with five states in the preceding quarter.

Across the country, second-quarter changes were mostly negative, with only 11 states seeing adoption rates rise. Maryland had the smallest increase, while New Mexico, with a 14% gain (to 24% adoption), posted the largest — and the only double-digit — increase in the nation. Quarterly declines for the other 40 states ranged from 0.5% in Alabama (to 30% adoption) to 20% in Maine (to 21% adoption). In all, 40 states had at least one-quarter of their unique IPv4 addresses connecting to Akamai at average speeds of 15 Mbps or faster, down from 44 in the first quarter.

Like the first quarter, year-over-year changes in 15 Mbps broadband adoption were positive in the second quarter. Wisconsin posted the smallest gain in the country at 29% (to 30% adoption), while Alaska led the nation with a sizeable 164% increase (to 24% adoption). Three additional states saw adoption rates at least double, and 31 more saw adoption increase by at least 50% compared with a year prior. Among the top 10, Maryland led in yearly increases with a 70% jump, while Washington saw the smallest year-over-year gain at 30%.

	State % Above 10 Mbps		QoQ Change	YoY Change
1	Rhode Island	76%	-3.2%	14%
2	New Jersey	74%	-1.0%	20%
3	Delaware	73%	-8.1%	6.8%
4	Massachusetts	71%	-3.6%	14%
5	Maryland 70%		0.2%	32%
6	New York	67%	-2.6%	24%
7	District Of Columbia	66%	-1.4%	34%
8	Virginia	66%	-1.1%	13%
9	Florida	62%	3.9%	22%
10	Connecticut	62%	-3.6%	15%

Figure 15: 10 Mbps Broadband Adoption (IPv4) by State

	State	% Above 15 Mbps	QoQ Change	YoY Change
1	Rhode Island	52%	-5.3%	59%
2	New Jersey	51%	-1.7%	63%
3	Delaware	50%	-12%	31%
4	District Of Columbia	50%	-1.7%	53%
5	Maryland	48%	0.1%	70%
6	Massachusetts	Massachusetts 48% -6.6%		45%
7	Virginia	46%	-1.2%	40%
8	New York	43%	-3.6%	60%
9	Pennsylvania	40%	-6.5%	48%
10	Washington	39%	-4.3%	30%

Figure 16: 15 Mbps Broadband Adoption (IPv4) by State

Idaho was once again the state with the lowest 15 Mbps adoption rate, as its adoption level fell 12% (to 16% adoption) in the second quarter. Arkansas was in second-to-last place as its adoption level declined 5.6% (to 19% adoption). Kentucky, which shared the second-to-last place with Arkansas in the first quarter, posted a 3.0% increase (to 20% adoption).

3.6 UNITED STATES 25 MBPS BROADBAND ADOPTION (IPv4) / The District of Columbia held on to the top spot in the nation in 25 Mbps broadband adoption, with an adoption rate seven percentage points higher than second-place Delaware, as seen in Figure 17. Both states saw quarterly declines in adoption in the second quarter, however, as did 7 of the top 10 states. Losses ranged from 1.9% in Washington to 16% in Delaware, while gains among the other three states ranged from 0.2% in New Jersey to 3.3% in Maryland. In the second quarter, the District of Columbia was the only state in the nation to have at least one in four of its unique IPv4 addresses connecting to Akamai at average speeds of at least 25 Mbps, as Delaware's 16% decline dropped it below this threshold.

Across the nation, changes were mixed, as 19 of the 51 states enjoyed quarterly gains in the second quarter, compared with 48 in the preceding quarter. Increases ranged from 0.2% in New Jersey to 19% in Alaska (to 6.2% adoption), with only 6 states seeing double-digit gains as compared with 38 states in the first quarter of 2016 and all 51 states in the fourth quarter of 2015. On the declining side, Maine saw the biggest quarterly loss at 31% (to 5.3% adoption), while Wyoming saw the smallest at 1.3% (to 10% adoption). Nine states in all posted double-digit declines in 25 Mbps broadband adoption rates as compared with the first quarter.

Year-over-year changes were positive across all 51 states, just as in the previous few quarters. Among the top 10, gains were robust, ranging from Virginia's 47% to New Jersey's 158%, with 3 of the top 10 seeing adoption rates more than double compared with the second quarter of 2015. Gains across the rest of the nation were strong as well, ranging from 14% in Idaho (to 4.9% adoption)

	State	% Above 25 Mbps	QoQ Change	YoY Change
1	District Of Columbia	28%	-2.2%	76%
2	Delaware	21%	-16%	63%
3	Rhode Island	21%	-3.7%	136%
4	Maryland	20%	3.3%	126%
5	Massachusetts	19%	-8.9%	86%
6	New Jersey	19%	0.2%	158%
7	Virginia	19%	0.6%	47%
8	Utah	17%	-11%	48%
9	Washington	17%	-1.9%	48%
10	New York	16%	-3.0%	85%

Figure 17: 25 Mbps Broadband Adoption (IPv4) by State

to 238% in Alaska (to 6.2% adoption). Fourteen states in all saw adoption rates more than double year over year in the second quarter, down from nineteen in the preceding quarter.

Nationwide, 25 Mbps broadband adoption rates remained fairly low nationwide but are steadily improving. In all, 17 states saw adoption levels below 10%, an improvement from 23 in the first quarter. Kentucky and Idaho had the lowest adoption rates in the country at 4.7% and 4.9% respectively and were the only two states with adoption levels below 5%.



[SECTION]⁴ GEOGRAPHY AMERICAS

he metrics presented here for the Americas region (North and South America) are based on a subset of data used for Section 2 and are subject to the same thresholds and filters discussed within that section. The subset used for this section includes connections identified as coming from networks within North and South America, based on classification by Akamai's EdgeScape geolocation tool.

4.1 AMERICAS AVERAGE CONNECTION SPEEDS (IPv4) / In the second quarter of 2016, the United States again had the fastest average connection speed among surveyed Americas countries, with Canada just 1.6 Mbps behind, as shown in Figure 18. As the only two countries in the region with average connection speeds above the 10 Mbps broadband threshold, the United States and Canada remained well ahead of the other countries in the region, with Canada having an average connection speed more than 6 Mbps faster than third-place Mexico. The gap in average connection speeds between the fastest and slowest countries in the region also widened ever so slightly, from 13.4 Mbps to 13.5 Mbps. Unlike the first quarter, which saw positive changes across the board, in the second quarter, only four surveyed countries posted quarterly gains, and increases were modest. Peru had the biggest gain at 6.7%, while Panama posted the smallest increase at 1.0%. On the declining side, average connection speeds in the Americas dropped between 0.2% (in the United States) to 8.4% (in Costa Rica).

Global Rank	Country/Region	Q2 2016 Avg. Mbps	QoQ Change	YoY Change
17	United States	15.3	-0.2%	28%
27	Canada	13.7	-4.3%	23%
63	Mexico	7.4	4.5%	35%
66	Chile	7.0	-4.5%	31%
72	Uruguay	6.5	-7.8%	10%
84	Peru	5.5	6.7%	17%
87	Argentina	5.2	-2.9%	11%
89	Ecuador	5.1	-4.1%	26%
92	Brazil	4.8	6.3%	36%
97	Colombia 4.6		-1.9%	1.8%
98	Panama	4.5	1.0%	37%
114	Costa Rica	3.5	-8.4%	11%
129	Bolivia	2.4	-3.8%	21%
135	Paraguay	2.0	-6.3%	31%
142	42 Venezuela 1.8		-7.2%	-1.9%

Figure 18: Average Connection Speed (IPv4) by Americas Country

With the exception of Venezuela, all of the surveyed countries saw positive growth on a yearly basis, ranging from 1.8% in Colombia to 37% in Panama. Venezuela saw a modest decline of 1.9%. Like the preceding quarter, 13 of the 15 countries saw double-digit quarterly increases in average connection speeds. Eleven of the surveyed Americas countries had an average connection speed at or above the 4 Mbps threshold — the same as in the first quarter.

4.2 AMERICAS AVERAGE PEAK CONNECTION SPEEDS (IPv4) / In the second quarter of 2016, the United States regained the top spot among the surveyed Americas countries for average peak connection speeds after ceding it to Uruguay in the previous quarter. As shown in Figure 19, the United States posted a 2.8% quarterly gain in average peak speed while Uruguay posted a 10% loss. Uruguay's loss was the only double-digit decline among the surveyed countries, although Bolivia, Venezuela, and Colombia also posted losses of 6.1%, 1.3%, and 1.3% respectively. Among the remaining countries, gains ranged from 0.4% in Paraguay to 9.7% in Mexico. The difference between the average peak connection speeds of the fastest and slowest Americas countries decreased slightly from 58.7 Mbps in the first quarter to 57.7 Mbps in the second quarter.

Year-over-year changes were mixed as well, with four countries seeing declines ranging from 15% in Colombia to 18% in Bolivia. Conversely, Costa Rica had the smallest yearly increase at 9.5%, while the remaining countries enjoyed double-digit growth, led by Chile with a 42% yearly gain.

4.3 AMERICAS 4 MBPS BROADBAND ADOPTION (IPv4) / With a 90% adoption rate, Canada remained the leader in the Americas region for 4 Mbps broadband adoption in the second quarter of 2016, followed by the United States at 86%, as seen in Figure 20. The difference in adoption rates between the top and bottom qualifying Americas countries was a sizeable 86 percentage points, the same as

Global Rank	Country/Region	Country/Region Q2 2016 Peak Mbps		YoY Change
22	United States	69.7	2.8%	34%
28	Uruguay	63.8	-10%	34%
32	Canada	60.6	1.6%	25%
58	Chile	50.4	3.7%	42%
88	Mexico	35.2	9.7%	29%
91	Brazil	33.7	1.4%	29%
92	Peru	33.7	7.6%	11%
96	Ecuador	32.2	2.0%	29%
97	Argentina	31.8	6.8%	24%
114	Colombia	23.5	-1.3%	-15%
118	Panama 20.9 9.4%		9.4%	17%
125	5 Costa Rica 19.0		1.8%	9.5%
137	Bolivia	13.9	-6.1%	-18%
138	Paraguay	12.6	0.4%	-17%
139	Venezuela	12.0	-1.3%	-17%

Figure 19: Average Peak Connection Speed (IPv4) by Americas Country

in the first quarter. As noted previously, this gap is likely to remain large for the foreseeable future. Unlike the first quarter, when all of the surveyed countries saw quarter-over-quarter growth in 4 Mbps broadband adoption, in the second quarter only Brazil, Mexico, and the United States posted gains, as their adoption rates rose 9.3%, 2.9%, and 0.9% respectively. Declines were widely varying in magnitude, ranging from 0.2% in Peru to 22% in Venezuela.

Looking at year-over-year changes, 11 of the 13 qualifying surveyed countries saw gains, though widely varying in magnitude. Canada again saw the smallest gain at 3.7%, followed by the United States with a 15% increase over the second quarter of 2015. Panama again saw the largest yearly increase among the qualifying countries with a 104% jump, and two other qualifying Americas countries saw 4 Mbps broadband adoption levels grow by more than 50%. Venezuela and Colombia were the two countries to see declines, as their adoption rates dropped 49% and 0.4% respectively, compared with the second quarter of 2015.

Though Canada leads the Americas in 4 Mbps adoption, a recent report put out by the Canadian Internet Registration Authority (CIRA) showed that speeds varied significantly between different parts of the country and between cities, suburbs, and rural communities.³⁰ Meanwhile, the Canadian government is continuing to further expand access, announcing in April that 23 service providers across the country would receive a total of CA\$34.5 million in funding to bring broadband access to more than 65,000 rural homes. Canada has earmarked CA\$305 million in the Connecting Canadians initiative to extend broadband to 300,000 households across the nation as well as an additional CA\$500 million through their Budget 2016 to help service rural communities in particular. The governments of British Columbia and Ontario have provided CA\$3.4 million and CA\$1.4 million respectively in additional support for projects in their provinces.³¹

Global Rank	Country/Region % Above 4 Mbps		QoQ Change	YoY Change	
35	Canada	90%	-0.7%	3.7%	
42	United States	86%	0.9%	15%	
51	Chile	81%	-3.7%	39%	
54	Mexico	80%	2.9%	29%	
65	Uruguay	73%	-5.6%	21%	
72	Peru	64%	-0.2%	16%	
80	Ecuador	54%	-7.6%	65%	
82	Argentina	52%	-2.7%	26%	
85	Colombia	49%	-11%	-0.4%	
87	Brazil 48% 9.3%		57%		
89	Panama 47% -1.9%		104%		
103	Costa Rica 27% -17%		-17%	41%	
117	Venezuela	enezuela 3.4% -22%		-49%	
-	Bolivia 6.9% -11%		-11%	77%	
-	Paraguay	y 6.6% -20%		301%	

Figure 20: 4 Mbps Broadband Adoption (IPv4) by Americas Country

4.4 AMERICAS 10 MBPS BROADBAND ADOPTION (IPv4) / As shown in Figure 21, the United States and Canada once again remained the clear leaders in 10 Mbps broadband adoption among the qualifying surveyed Americas countries. The gap between Canada and the next-highest country narrowed slightly from 36 percentage points to 35 in the second quarter of 2016, and the gap between the top and bottom qualifying countries narrowed from 54 points to 53. Unlike the first quarter, changes in adoption rates were mixed across the Americas in the second quarter, with four of the qualifying surveyed countries posting gains — ranging from 13% in Mexico to 66% in Peru — while six posted losses — ranging from 0.8% in the United States to 33% in Uruguay.

From a yearly perspective, all of the qualifying surveyed countries saw increases in 10 Mbps broadband adoption, though amounts varied widely. Argentina saw a mere 1.1% increase in adoption while Mexico posted a 166% increase. Four additional qualifying countries saw adoption rates more than double compared with a year prior.

4.5 AMERICAS 15 MBPS BROADBAND ADOPTION (IPv4) / As Figure 22 shows, only 8 of the 15 surveyed countries in the Americas region qualified for inclusion in the 15 Mbps broadband adoption metric in the second quarter of 2016 — the same as in the first. Just as in the other broadband adoption metrics we have examined thus far, the United States and Canada continued to have adoption levels well above those seen in the remaining Americas countries, although the gap between Canada and the next-highest country narrowed slightly — from 25 percentage points to 24 — while the gap between the top- and bottom-ranking countries stayed steady at 34 points. In contrast to the preceding quarter's robust gains, quarterly changes among the qualifying surveyed countries were mixed in the second quarter, with half of the countries showing gains and the

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change	
18	United States	56%	-0.8%	33%	
23	Canada	52%	-3.2%	29%	
56	Mexico	17%	13%	166%	
60	Chile	14%	-9.0%	105%	
63	Uruguay	11%	-33%	2.9%	
68	Argentina	7.6%	-12%	1.1%	
69	Peru	7.3%	66%	133%	
71	Ecuador	5.5%	-3.1%	120%	
73	Brazil	5.1%	35%	128%	
78	Colombia 3.2% 37%		37%	16%	
_	Panama 3.3% 3.7%		3.7%	166%	
_	Costa Rica	osta Rica 1.3% -13%		20%	
-	Bolivia	0.5% -11%		64%	
_	Paraguay	0.4% -25%		478%	
-	Venezuela	0.2%	-43%	-64%	

Figure 21: 10 Mbps Broadband Adoption (IPv4) by Americas Country

other half experiencing losses. Gains ranged from Argentina's 3.0% to Brazil's 50%, while declines ranged from the United States' 1.6% to Uruguay's 27%.

Conversely, year-over-year numbers were consistently positive across the Americas in the second quarter, in contrast to the first quarter's mixed results. Chile saw the largest increase in 15 Mbps adoption rates at 194%, while Mexico and Brazil also saw adoption more than double compared with one year prior. Uruguay had the smallest yearly increase among the qualifying surveyed countries at 6.6%.

Global Rank	Country/Region	% Above 15 Mbps	QoQ Change	YoY Change	
17	United States	35%	-1.6%	66%	
25	Canada	30%	-6.7%	72%	
56	Mexico	4.5%	13%	175%	
58	Chile	4.1%	-6.3%	194%	
60	Uruguay	3.0%	-27%	6.6%	
64	Argentina	1.7%	3.0%	20%	
65	Brazil	1.6%	50%	162%	
68	Colombia	0.8%	46%	41%	
_	Peru	2.2%	55%	286%	
_	Ecuador 1.4% 17%		17%	157%	
_	Panama 0.9% 20%		20%	177%	
-	Costa Rica	0.4% -27%		-2.8%	
-	Bolivia	0.2%	-9.9%	65%	
_	Paraguay	0.1%	-32%	405%	
_	Venezuela	0.1%	-53%	-41%	

Figure 22: 15 Mbps Broadband Adoption (IPv4) by Americas Country



[SECTION]⁵ GEOGRAPHY ASIA PACIFIC (APAC)

he metrics presented here for the Asia Pacific region are based on a subset of data used for Section 2 and are subject to the same thresholds and filters discussed within that section. The subset used for this section includes connections identified as coming from networks in the Asia Pacific region, based on classification by Akamai's EdgeScape geolocation tool.

5.1 ASIA PACIFIC AVERAGE CONNECTION SPEEDS (IPv4) / As shown in Figure 23, in the second quarter of 2016, South Korea was again the top country/region in the world for the average connection speed metric, despite a 7.2% quarter-over-quarter drop in average connection speeds that narrowed the gap between it and lowest-ranked India from 26 Mbps to 23 Mbps. The second quarter saw gains across 11 of the 15 surveyed Asia Pacific countries/regions, ranging from 0.7% in New Zealand to 29% in Indonesia. Four countries enjoyed double-digit quarterly gains, compared with eleven in the first quarter. Among the countries/regions seeing declines, South Korea had the largest drop, while Hong Kong, with its 1.9% decrease, had the smallest.

Global Rank	Country/Region	Q2 2016 Avg. Mbps	QoQ Change	YoY Change
1	South Korea	27.0	-7.2%	17%
3	Hong Kong	19.5	-1.9%	15%
8	Singapore	17.2	4.5%	27%
9	Japan	17.1	-5.7%	5.1%
15	Taiwan	15.6	5.0%	51%
26	Thailand	13.7	27%	63%
42	New Zealand	10.6	0.7%	26%
51	Australia	8.5	-3.0%	6.8%
68	Malaysia	6.8	7.1%	36%
79	Indonesia	5.9	29%	148%
80	Sri Lanka	5.7	5.6%	7.2%
86	China	5.2	23%	52%
88	Vietnam	5.1	2.3%	58%
100	Philippines 4.3		24%	37%
113	India	3.6	3.2%	54%

Figure	23: Average	Connection	Speed	(IPv4) b	v APAC	Country/Region
				(

Global Rank	Country/Region	Country/Region Q2 2016 Peak Mbps		YoY Change
1	Singapore	157.3	7.1%	44%
2	Hong Kong	114.3	3.6%	21%
3	South Korea	110.1	6.3%	33%
7	Indonesia	91.9	-17%	355%
8	Taiwan	88.8	6.9%	23%
9	Japan	85.3	0.9%	14%
15	Thailand	77.6	11%	42%
47	New Zealand	53.8	8.0%	32%
56	Australia	51.1	16%	24%
57	Malaysia	51.0	10%	39%
63	Sri Lanka	43.9	24%	37%
82	Vietnam	37.1	8.9%	63%
85	China	35.4	14%	92%
94	Philippines	32.9	9.8%	28%
109	India	26.1	2.5%	42%

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Fourteen of the fifteen surveyed Asia Pacific countries/regions had average connection speeds above the 4 Mbps broadband threshold in the second quarter — up from thirteen in the first — and seven of these exceeded the 10 Mbps threshold — the same as in the first quarter. India and the Philippines once again had the lowest average connection speeds among surveyed countries in the region, at 3.6 Mbps and 4.3 Mbps respectively. However, the Philippines hopes to enjoy faster speeds soon, as the two major network service providers in the country — Philippine Long Distance Telephone Co. (PLDT) and Globe Telecom — announced in the second quarter the procurement of an additional wireless spectrum that is expected to enable faster Internet service speeds at lower costs, albeit for wireless (mobile) connectivity.³²

All 15 surveyed countries/regions in the Asia Pacific region showed year-over-year growth in observed average connection speeds in the second quarter, just as in the first. Indonesia, with a 148% gain, was again the only country to see its average connection speed more than double compared with the year prior. Increases in the remaining countries/regions ranged from 5.1% in Japan to 63% in Thailand.

Australia, which sits roughly in the middle of the region for average speeds, may see some increases in the upcoming year. The National Broadband Network (NBN), Australia's national wholesale broadband provider, announced in April the availability of a new satellite broadband service with speeds of up to 25 Mbps.³³ In addition, NBN is working on deploying DOCSIS3.1 and G.Fast technologies that will enable ultra-high-speed services through existing networks.³⁴ However, availability of faster speeds does not necessarily mean users will choose to use them; an NBN report released in April found that roughly 22% of customers were selecting with the slowest available performance tier available (12 Mbps), 67% were opting for the second-lowest (25 Mbps), and only 7% were choosing the fastest tier (100 Mbps).³⁵

5.2 ASIA PACIFIC AVERAGE PEAK CONNECTION SPEEDS (IPv4) / As seen in Figure 24, the Asia Pacific region continued to lead the world in average peak connection speeds in the second quarter, with the top three global leaders all found in the region. Singapore, Hong Kong, and Thailand all had average peak connection speeds above 100 Mbps, although Indonesia, with a 17% quarterly decline in its average peak connection speed, dropped out of this elite group. In all, 10 of the surveyed countries/regions saw average peak speeds above 50 Mbps, up from seven in the first quarter. After its regionleading gains in the first quarter, Indonesia was the only country to see a drop in speeds in the second quarter, as the other Asia Pacific countries/regions posted quarter-over-quarter gains ranging from 0.9% in Japan to 24% in Sri Lanka. The gap between average peak connection speeds in the top- and bottom-ranked countries/ regions in the region continued to rise, increasing from 121 Mbps in the first quarter to 131 Mbps in the second.

Like the previous quarter, year-over-year changes were consistently positive throughout the Asia Pacific region in the second quarter. Japan had the smallest gain at 14%, while Indonesia again had the largest at 355%. The remaining countries/regions all posted doubledigit gains, ranging from 21% in Hong Kong to 92% in China.

5.3 ASIA PACIFIC 4 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter, South Korea once again led the Asia Pacific region in 4 Mbps broadband adoption, with 97% of its IPv4 addresses connecting to Akamai at average connection speeds above this threshold, as shown in Figure 25. Unlike the preceding quarter when all of the surveyed Asia Pacific countries/regions saw

Global Rank	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
3	South Korea	97%	-0.5%	0.7%
5	Thailand	96%	0.1%	5.1%
16	Hong Kong	93%	-0.3%	0.5%
18	Taiwan	93%	0.5%	3.4%
20	Singapore	93%	1.7%	8.0%
24	Japan	92%	-0.2%	1.8%
32	New Zealand	90%	-0.7%	2.7%
47	Sri Lanka	83%	18%	8.9%
64	Australia	75%	-3.1%	1.5%
70	Malaysia	66%	-3.2%	22%
71	Indonesia	66%	43%	672%
75	China	63%	44%	128%
79	Vietnam	57%	4.2%	80%
97	Philippines	33%	79%	116%
106	India	25%	6.6%	129%

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
1	South Korea	79%	-5.3%	7.1%
2	Singapore	67%	3.2%	34%
4	Hong Kong	66%	-0.3%	6.3%
6	Japan	65%	-1.1%	8.4%
14	Thailand	59%	50%	195%
16	Taiwan	58%	1.7%	84%
41	New Zealand	33%	0.8%	65%
49	Australia	22%	-4.9%	23%
58	Malaysia	16%	38%	258%
67	Indonesia	8.2%	178%	1292%
70	Vietnam	6.4%	32%	1389%
72	India	5.4%	11%	251%
74	Philippines	5.0%	86%	683%
76	China	4.3%	107%	259%
_	Sri Lanka	6.2%	37%	95%

Figure 26: 10 Mbps Broadband Adoption (IPv4) by APAC Country/Region

quarterly growth in adoption rates, in the second quarter, 6 of the 15 saw small losses, ranging from 0.2% in Japan to 3.2% in Malaysia. The Philippines enjoyed the strongest growth in the region, with a 79% quarterly gain, while three other countries/regions also posted double-digit increases. Thailand had the smallest gain in the region at 0.1%. Singapore, which ranked fifth in the Asia Pacific region, may soon see an increase in 4 Mbps adoption as Wireless@sG, its free public Wi-Fi service, will soon more than double in speed from 2 Mbps to 5 Mbps. In addition, the number of hotspots available will double from 10,000 to 20,000 by 2018.³⁶ Seven of the surveyed Asia Pacific countries/regions enjoyed 4 Mbps broadband adoption rates of 90% or higher — the same as in the first quarter — and the difference in adoption levels between the top- and bottom-ranked countries/regions in the Asia Pacific region narrowed from 79 to 72 percentage points in the second quarter.

Looking at year-over-year changes, all 15 surveyed countries/regions saw improvements in the second quarter, although adoption growth rates varied from a mere 0.5% in Hong Kong to 672% in Indonesia. Most of the countries/regions saw modest, single-digit increases, with only two countries/regions seeing double-digit gains and three countries/regions slightly more than doubling their adoption rates compared with one year prior.

5.4 ASIA PACIFIC 10 MBPS BROADBAND ADOPTION (IPv4) / South Korea led both the region and the world in 10 Mbps broadband adoption once again in the second quarter, despite a 5.3% quarterly drop in adoption rates. As seen in Figure 26, South Korea had 79% of its IPv4 addresses connecting to Akamai at average connection speeds above the 10 Mbps threshold—12 percentage points above Singapore, the next-closest country/region in Asia Pacific. The gap between South Korea and the qualifying Asia Pacific country/region with the lowest adoption

levels narrowed from 82 percentage points in the first quarter to 75 in the second. Ten of the fourteen countries/regions saw adoption rates rise compared with the previous quarter, although the magnitude of gains varied widely, from New Zealand's 0.8% to Indonesia's 178%. China also saw adoption rates more than double, while five other countries/regions enjoyed double-digit gains. Among countries with declining adoption rates, Hong Kong had the smallest decrease at 0.3%, while South Korea had the largest.

Year-over-year changes in 10 Mbps adoption were positive across the board, continuing the first quarter's trend. Four qualifying Asia Pacific countries/regions saw double-digit increases in adoption rates, and five saw triple-digit jumps, while Indonesia and Vietnam posted astounding gains of 1,292% and 1,389% respectively. Hong Kong had the smallest yearly gain in the region at 6.3%.

5.5 ASIA PACIFIC 15 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter, the Philippines and Indonesia had enough unique IPv4 addresses connecting to Akamai at 15 Mbps or higher to qualify for inclusion in this metric, increasing the number of qualifying countries/regions in the Asia Pacific region to 14 (up from 12 in the first quarter). As seen in Figure 27, South Korea continued to lead the region (and the world) in the 15 Mbps broadband adoption metric, with 63% of its IPv4 addresses connecting to Akamai at average connection speeds above 15 Mbps, down 9.0% from the first quarter. The spread between it and China, the Asia Pacific country/region with the lowest adoption rate, narrowed from 68 percentage points in the first quarter to 62 in the second, although China's adoption levels remained well under 1%.

Unlike the previous quarter, when all of the qualifying surveyed countries/regions in Asia Pacific posted quarterly gains, in the second quarter four countries/regions saw drops in adoption, ranging from 2.6% in Hong Kong to 9.0% in South Korea. Increases ranged from 1.0% in India to 160% in Indonesia, with the Philippines and Thailand also more than doubling adoption rates compared with the first quarter. Three other countries/regions in Asia Pacific saw double-digit quarterly gains.

Like the first quarter, yearly growth in the Asia-Pacific region was robust and positive across the board. Japan posted the smallest increase at 11%, but 8 of the 14 qualifying surveyed countries more than doubled their adoption levels compared with the preceding year, and Vietnam once again saw the biggest yearly growth in 15 Mbps adoption at an impressive 1,512%.

Global Rank	Country/Region	% Above 15 Mbps	QoQ Change	YoY Change
1	South Korea	63%	-9.0%	20%
3	Hong Kong	46%	-2.6%	16%
4	Singapore	45%	4.4%	68%
7	Japan	42%	-4.5%	11%
18	Taiwan	34%	3.6%	146%
23	Thailand	30%	103%	368%
40	New Zealand	16%	8.1%	135%
46	Australia	9.7%	-5.8%	33%
54	Malaysia	5.0%	61%	425%
61	Philippines	2.1%	109%	872%
62	Indonesia	2.1%	160%	814%
63	India	2.0%	1.0%	246%
66	Vietnam	1.3%	63%	1512%
69	China	0.6%	62%	173%
_	Sri Lanka	1.6%	0.6%	126%

Figure 27: 15 Mbps Broadband Adoption (IPv4) by APAC Country/Region



[SECTION]⁶ GEOGRAPHY *EUROPE*

Beginning with the First Quarter, 2016 State of the Internet Report, broadband metrics are presented separately for the European region and the Middle East/Africa region (previously presented together as the EMEA region), with expanded coverage to include more countries in both regions. The metrics presented here for the European region are based on a subset of data used for Section 2 and are subject to the same thresholds and filters discussed within that section. The subset used for this section includes connections identified as coming from networks in the European region, based on classification by Akamai's EdgeScape geolocation tool.

6.1 EUROPEAN AVERAGE CONNECTION SPEEDS (IPv4) / Despite a 5.8% quarter-over-quarter decrease in average connection speeds to 20.1 Mbps, Norway retained the top spot among the surveyed European countries in the second quarter of 2016. As seen in Figure 28, the difference in average connection speeds between the fastest and slowest countries in the region was 13 Mbps in the second quarter, down from 14 Mbps in the first. Twenty-six of the thirty-one surveyed countries had average connection speeds at or above the 10 Mbps threshold—the same as in the previous quarter. In contrast to across-the-board growth in speeds during the first quarter, in the second quarter 23 of the 31 countries saw quarterly declines, ranging from 0.6% in Finland to 11% in Slovakia. Among the remaining surveyed European countries, gains were modest, ranging from 0.4% in the United Kingdom to 5.9% in Spain.

Like the first quarter, year-over-year changes in average connection speeds during the second quarter were positive across the board with the exception of Ireland, which saw an 18% decline to 13.9 Mbps. The Netherlands posted the smallest yearly increase at 8.7%, while the remaining countries all enjoyed double-digit gains. Norway and Croatia enjoyed the biggest gains in the region at 55% each, and 16 countries saw yearly gains of at least 25%.

Global Rank	Country/Region	Q2 2016 Avg. Mbps	QoQ Change	YoY Change
2	Norway	20.1	-5.8%	55%
4	Sweden	18.8	-8.8%	19%
5	Switzerland	18.3	-1.9%	17%
6	Finland	17.6	-0.6%	26%
7	Latvia	17.5	-4.5%	23%
11	Netherlands	17.0	-5.2%	8.7%
12	Czech Republic	16.5	-7.0%	18%
13	Denmark	16.3	-5.0%	29%
14	Romania	15.8	-1.7%	29%
16	Bulgaria	15.4	-2.8%	22%
18	Belgium	15.1	-0.9%	31%
20	United Kingdom	15.0	0.4%	27%
21	Lithuania	14.7	-2.6%	12%
22	Slovenia	14.6	0.7%	52%
23	Spain	14.1	5.9%	46%
24	Germany	14.1	0.9%	31%
25	Ireland	13.9	-3.2%	-18%
30	Hungary	13.4	-2.8%	35%
33	Portugal	12.9	-1.9%	24%
34	Malta	12.8	0.7%	39%
35	Austria	12.8	-4.9%	17%
36	Slovakia	12.3	-11%	21%
37	Russia	12.3	1.0%	28%
38	Poland	12.2	-4.2%	22%
39	Estonia	11.6	-0.8%	36%
45	Luxembourg	10.1	-4.6%	12%
48	France	9.6	-2.8%	21%
53	Italy	8.2	0.5%	29%
56	Croatia	7.7	4.2%	55%
59	Greece	7.5	-3.8%	17%
69	Cyprus	6.7	-6.9%	35%

Figure 28: Average Connection Speed (IPv4) by European Country

6.2 EUROPEAN AVERAGE PEAK CONNECTION SPEEDS (IPv4) / Romania again led the European region in average peak connection speeds in the second quarter with a 2.2% quarterly increase to 84.2 Mbps, widening the gap with lowest-ranked Cyprus from 54 Mbps to 56 Mbps. As seen in Figure 29, quarterly changes were mixed, with 9 of the 31 surveyed countries seeing declines. The decreases were small, ranging from 0.1% in Switzerland to 3.1% in Luxembourg. Among the gaining countries, increases ranged from 0.5% in Bulgaria to 16% in Croatia, with only two other countries seeing double-digit growth. Twenty-six had average peak connection speeds of at least 50 Mbps, up from twenty-five in the first quarter.

Year-over-year changes were positive across the board for the surveyed European countries in the second quarter, led by Croatia with a 59% yearly increase. In all, 28 of the 31 surveyed countries enjoyed double-digit growth in average peak connection speeds, while Ireland posted the smallest gain at 1.3%.

Several second-quarter announcements point to a continued push for wider broadband coverage and faster speeds in the United Kingdom. U.K.-based Satellite Internet announced that it recently finished deploying its satellite-based broadband service that will provide speeds of up to 25 Mbps for the rural village of Broomfield in Somerset, England. The project was part of the British government's £10m Innovation Fund, aimed at enabling fast broadband access to the most remote and hard-to-reach areas in the U.K..37 Meanwhile, Internet service provider Hyperoptic launched its fiber-based gigabit services to its 13th city - Brighton in East Sussex, England³⁸—and GibFibre announced that their 10 Gbps service, which they began building out in 2014, now covers an impressive two-thirds of the British Overseas Territory of Gibraltar.³⁹ Finally, major British telecommunications provider BT Group announced it would invest £6 billion over the next three years to improve high-speed fixed and mobile services. It plans to offer "ultrafast" broadband to 12 million homes and businesses by 2020, primarily through G.Fast technology, which currently enables speeds of up to 300 Mbps and is expected to eventually support speeds of up to 500 Mbps.40

Elsewhere in Europe, Starman, the largest cable company in Estonia, announced in June it would partner with Nokia to deploy Europe's first nationwide 10-gigabit Ethernet Passive Optical Network, enabling to-the-home speeds of 1 Gbps in the near term and 10 Gbps in the future.⁴¹ The network is expected to go live before the end of the year.

6.3 EUROPEAN 4 MBPS BROADBAND ADOPTION (IPv4) / Despite a 0.4% quarterly decrease in 4 Mbps adoption, Malta retained its top standing in the region in the second quarter, while Bulgaria — which previously shared the top spot with Malta — dropped into seventh place among surveyed European countries with a 2.3% decline. As seen in Figure 30, only 9 of the 31 countries posted increases in adoption in the second quarter, and those gains were very modest, ranging from 0.2% in Norway to 2.3% in Lithuania. Declines in the region were small as well, with France's 5.8% being the largest and Romania's 0.1% being the smallest. Like the first quarter, a total of 20

Global Rank	Country/Region	Q2 2016 Peak Mbps	QoQ Change	YoY Change
10	Romania	84.2	2.2%	22%
13	Sweden	78.1	-1.7%	25%
14	Latvia	77.7	3.4%	25%
17	Switzerland	76.1	-0.1%	28%
18	Netherlands	72.5	2.9%	18%
20	Belgium	71.1	2.7%	32%
21	Spain	70.7	9.1%	48%
23	Norway	69.0	-0.9%	52%
26	Hungary	65.0	3.2%	27%
27	Russia	64.4	1.0%	19%
29	Czech Republic	63.4	-0.7%	29%
31	United Kingdom	62.1	1.8%	22%
34	Finland	60.2	0.8%	13%
35	Denmark	59.7	1.8%	26%
36	Ireland	59.5	-1.8%	1.3%
37	Bulgaria	59.3	0.5%	16%
38	Luxembourg	58.9	-3.1%	12%
40	Malta	57.2	14%	39%
42	Germany	55.7	3.5%	19%
43	Slovakia	54.4	-2.5%	26%
45	Poland	54.1	1.8%	24%
46	Estonia	54.0	8.1%	38%
49	Portugal	53.4	3.9%	11%
52	Slovenia	52.9	11%	39%
53	Lithuania	52.3	4.1%	4.2%
55	Austria	51.9	1.5%	20%
70	Croatia	41.2	16%	59%
73	France	40.5	-1.2%	8.9%
77	Italy	39.4	7.9%	30%
95	Greece	32.5	2.6%	11%
106	Cyprus	27.8	-2.1%	26%

Global Rank	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
2	Malta	97%	-0.4%	4.9%
6	Netherlands	96%	0.4%	2.4%
7	Latvia	95%	0.4%	7.7%
8	Romania	95%	-0.1%	6.4%
9	Switzerland	95%	-1.0%	1.6%
10	Denmark	95%	-1.2%	1.4%
11	Bulgaria	95%	-2.3%	-2.0%
13	Belgium	94%	0.4%	5.2%
14	Hungary	94%	-0.5%	7.9%
15	Sweden	94%	-0.5%	2.7%
19	Austria	93%	-1.2%	2.8%
21	Finland	92%	-0.4%	2.8%
25	Norway	92%	0.2%	6.0%
26	Russia	91%	-0.2%	8.6%
27	Lithuania	91%	2.3%	8.6%
28	Germany	91%	-0.9%	4.0%
29	Spain	91%	0.3%	7.6%
30	United Kingdom	90%	-1.2%	5.6%
31	Poland	90%	-1.3%	2.3%
34	Estonia	90%	1.8%	25%
36	Czech Republic	89%	-1.4%	2.6%
37	Slovenia	89%	0.7%	11%
38	Luxembourg	88%	-1.2%	-0.7%
40	Portugal	88%	-1.0%	1.0%
41	Slovakia	87%	-3.4%	9.5%
43	Greece	86%	-2.1%	12%
44	Croatia	85%	1.4%	58%
52	Ireland	81%	-2.6%	11%
53	Italy	81%	-2.4%	16%
57	Cyprus	79%	-3.4%	42%
61	France	76%	-5.8%	1.6%

Figure 29: Average Peak Connection Speed (IPv4) by European Country

countries enjoyed 4 Mbps broadband adoption rates of at least 90% in the second quarter with several more in close range. France's 76% adoption rate was the lowest in the region - 21 percentage points lower than Malta's.

On a year-over-year basis, two of the surveyed European countries-Bulgaria and Luxembourg-saw slight drops in 4 Mbps broadband adoption, posting declines of 2.0% and 0.7% respectively. Croatia again led the gainers with a 58% increase in adoption, while Portugal saw the smallest yearly growth at 1.0%. A total of seven countries saw year-over-year growth of more than 10% in the second quarter.

6.4 EUROPEAN 10 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter, in spite of a 5.0% quarterly decline, Switzerland maintained the top spot among surveyed European countries with a 10 Mbps adoption rate of 65%. As seen in Figure 31, 16 European countries had at least half of their unique IPv4 addresses connecting to Akamai at average speeds of at least 10 Mbps, up from 15 in the first quarter, and the gap between the highest and lowest adoption rates in the region narrowed from 56 Mbps to 54 Mbps. Quarterly changes in adoption rates were mostly negative across Europe in the second quarter, as 25 countries posted declines ranging from 0.1% in Estonia to 12% in Greece. Croatia again led the few gainers with a 22% increase in adoption, though the other increases were more moderate, ranging from 0.4% in Slovenia to 6.2% in Spain.

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
2	Switzerland	65%	-5.0%	7.5%
7	Belgium	64%	-2.6%	37%
8	Norway	64%	-1.7%	60%
9	Bulgaria	64%	-3.1%	17%
10	Netherlands	63%	-6.2%	8.4%
11	Romania	62%	-3.5%	15%
12	Latvia	62%	0.8%	26%
13	Denmark	59%	-5.9%	26%
15	Finland	58%	-4.1%	21%
17	Sweden	57%	-8.7%	10%
20	Malta	55%	-2.6%	79%
21	United Kingdom	53%	-0.4%	28%
22	Czech Republic	53%	-6.1%	10%
26	Russia	50%	1.7%	52%
27	Hungary	50%	-6.0%	46%
28	Spain	50%	6.2%	62%
29	Portugal	48%	-1.2%	26%
30	Lithuania	47%	-2.6%	6.8%
31	Germany	47%	-0.9%	37%
32	Ireland	44%	-7.6%	15%
33	Slovenia	42%	0.4%	88%
34	Poland	41%	-8.3%	25%
35	Estonia	40%	-0.1%	57%
36	Austria	39%	-6.5%	27%
40	Slovakia	34%	-9.7%	29%
45	Luxembourg	28%	-5.7%	31%
46	France	26%	-7.8%	34%
54	Italy	19%	5.5%	111%
57	Croatia	16%	22%	381%
61	Greece	14%	-12%	71%
64	Cyprus	11%	-11%	202%

Global Rank	Country/Region	% Above 15 Mbps	QoQ Change	YoY Change
2	Norway	48%	-3.7%	100%
5	Switzerland	42%	-4.2%	24%
6	Romania	42%	1.3%	65%
9	Latvia	41%	-3.5%	32%
10	Sweden	41%	-10%	24%
11	Bulgaria	39%	-2.0%	61%
12	Netherlands	38%	-9.4%	22%
13	Denmark	38%	-7.3%	61%
14	Belgium	37%	-3.9%	73%
15	Finland	36%	-2.9%	37%
16	United Kingdom	36%	0.4%	54%
19	Lithuania	32%	-3.1%	13%
20	Czech Republic	32%	-9.8%	21%
21	Spain	32%	12%	122%
24	Portugal	30%	-1.8%	69%
27	Ireland	28%	-5.3%	36%
28	Germany	27%	3.1%	78%
29	Hungary	27%	-7.8%	87%
30	Malta	27%	3.7%	158%
32	Russia	25%	4.4%	89%
33	Slovenia	24%	2.1%	117%
34	Poland	22%	-6.8%	50%
35	Estonia	20%	-4.1%	80%
36	Austria	20%	-6.6%	33%
37	Slovakia	19%	-13%	35%
43	France	14%	-0.7%	82%
48	Italy	7.9%	14%	159%
52	Croatia	5.1%	8.9%	286%
59	Greece	4.1%	-5.4%	82%
-	Luxembourg	14%	-3.3%	51%
-	Cyprus	3.1%	-12%	166%

Figure 31: 10 Mbps Broadband Adoption (IPv4) by European Country

All 31 surveyed European countries posted yearly gains in the second quarter, just as in the first quarter. Three countries — Croatia, Cyprus, and Italy — saw adoption rates more than double compared with the second quarter of 2015, with yearly increases of 381%, 202%, and 111% respectively. The remaining European countries saw gains ranging from 6.8% in Lithuania to 88% in Slovenia.

6.5 EUROPEAN 15 MBPS BROADBAND ADOPTION (IPv4) / As seen in Figure 32, Norway held on to the top position in 15 Mbps broadband adoption among surveyed European countries in the second quarter of 2016 with an adoption rate of 48%, down 3.7% from the first quarter. Luxembourg did not have enough unique IPv4 addresses connecting to Akamai at average speeds of at least 15 Mbps to qualify for inclusion in the second quarter, decreasing

Figure 32: 15 Mbps Broadband Adoption (IPv4) by European Country

the total number of qualifying countries in the region to 29 from 30. As noted previously, this may be due to new high-speed broadband services within the country leveraging native IPv6 connectivity. Nine of the qualifying countries saw quarterly gains in adoption, led by Italy with a 14% increase. The United Kingdom posted the smallest gain at 0.4%. On the flip side, quarterly losses ranged from France's 0.7% to Slovakia's 13%.

In all, 24 of the 29 qualifying surveyed European countries had at least one in five IPv4 addresses connecting to Akamai at average speeds above 15 Mbps—down from 25 in the previous quarter—while three surveyed countries had adoption rates below 10%. Greece, the country with the lowest adoption level in the region, lagged 44 percentage points behind top-performing Norway, narrowing the gap slightly from 46 points in the first quarter.

Year-over-year changes were positive across the board in the second quarter, with Croatia again posting the largest gain at 286%. Five additional countries in the region saw adoption rates more than double, while Lithuania posted the smallest yearly gain among the qualifying surveyed European countries at 13%.



[SECTION]⁷ GEOGRAPHY MIDDLE EAST + AFRICA (MEA)

Beginning with the First Quarter, 2016 State of the Internet Report, broadband metrics are presented separately for the European region and the Middle East / Africa (MEA) region (previously presented together as the EMEA region), with expanded coverage to include more countries in both regions. The metrics presented here for the MEA region are based on a subset of data used for Section 2 and are subject to the same thresholds and filters discussed within that section. The subset used for this section includes connections identified as coming from networks in the Middle East and Africa region, based on classification by Akamai's EdgeScape geolocation tool.

7.1 MEA AVERAGE CONECTION SPEEDS (IPv4) / With an average connection speed of 13.4 Mbps in the second quarter — down 0.4% from the first quarter — Israel again had the highest average speeds among the surveyed MEA countries. Israel and Qatar were the only two surveyed countries in the region to have an average connection speed above 10 Mbps, as seen in Figure 33. In contrast, Namibia posted

About half of the 13 MEA countries posted quarterly gains in the second quarter, with average speeds growing anywhere from a mere 2.0% in Saudi Arabia to a robust 64% in Egypt. The other half saw declines ranging from 0.4% in Israel to 14% in Nigeria and South Africa.

Year-over-year changes were positive across the board but varied widely in magnitude. Nigeria saw the smallest change with a 0.9% increase, while Kenya again had the largest with a 297% jump. Egypt and Qatar both more than doubled their speeds compared with one year prior, while eight countries posted double-digit yearly gains.

The second quarter saw a number of announcements that bode well for improving Internet connectivity between the MEA region and the rest of the world. In June, Omantel announced the landing in Oman of the Asia Africa Europe-1 (AAE1) — the third-longest submarine cable in the world, connecting 18 different countries.⁴² That same month, Ooredoo finished landing the Southeast-Middle East-Western Europe 5 (SEA-ME-WE 5) cable in Oman as well.⁴³ Meanwhile, seven MEA telecommunications companies signed an agreement to build and maintain the Djibouti Africa Regional Express (DARE), a 5,500km submarine cable system connecting multiple cities in the Middle East and Africa — Dar Es Salaam, Mombasa, Mogadishu, Bossaso, Berbera, Mocha, and Djibouti — with a target completion date of May 2018.⁴⁴ These high-capacity subsea cables should improve connectivity and reduce latencies for Internet traffic throughout the region.

7.2 MEA AVERAGE PEAK CONNECTION SPEEDS (IPv4) / Qatar led the MEA region once again in average peak connection speeds with a 9.6% quarterly increase to 97.8 Mbps — more than 26 Mbps higher than second-place Israel, as shown in Figure 34. On the other end of the spectrum, Namibia again had the lowest average peak connection speed, posting a 7.6% gain to 14.3 Mbps — 83.5 Mbps below Qatar. Nine of the thirteen surveyed MEA countries saw higher average peak connection speeds in the second quarter compared with the first, and quarterly increases ranged from 4.2% in Nigeria to 43% in Kuwait. On the declining side, Morocco saw the biggest quarterly decrease in speeds at 13%, while Iran had the smallest at 0.7%. Four of the surveyed MEA countries had average peak connection speeds of at least 50 Mbps, up from three in the previous quarter, while eight posted average peak connection speeds of at least 25 Mbps, up from seven previously.

Year-over-year changes were mostly positive in the second quarter, but Egypt and Israel both posted declines, losing 13% and 1.0% respectively. Kenya again had the largest gain with an increase of 223% over the previous year, followed by South Africa with an 81% gain. Note that like the preceding quarter, Kenya saw large quarterly and yearly improvements across many metrics in this quarter's report; these are likely due at least in part to improved Akamai connectivity to key network providers in the country. The remaining MEA surveyed countries posted gains between Kuwait's 0.4% and South Africa's 81%, with seven countries in total seeing double-digit gains.

7.3 / **MEA 4 MBPS BROADBAND ADOPTION (IPv4)** / Israel maintained the MEA region's top spot in 4 Mbps adoption in the second quarter with a 95% adoption rate, down 1.2% from the first, as seen in Figure 35. In total, six of the twelve qualifying surveyed countries in the region had at least half of their unique IPv4 addresses connecting to Akamai at average speeds of at least

Global Rank	Country/Region	Q2 2016 Avg. Mbps	QoQ Change	YoY Change
29	Israel	13.4	-0.4%	14%
31	Qatar	13.0	56%	101%
54	United Arab Emirates	8.0	-8.4%	9.6%
57	Kenya	7.7	5.5%	297%
65	Turkey	7.0	-3.3%	13%
67	Kuwait	6.8	3.7%	30%
82	South Africa	5.6	-14%	71%
93	Saudi Arabia	4.7	2.0%	57%
99	Morocco	4.4	3.3%	58%
108	Egypt	4.0	64%	110%
119	Iran	3.2	-9.7%	87%
123	Nigeria	2.9	-14%	0.9%
130	Namibia	2.4	4.0%	25%

Figure 33: Average Connection Speed (IPv4) by Middle East & Africa Country

Global Rank	Country/Region	Q2 2016 Peak Mbps	QoQ Change	YoY Change
5	Qatar	97.8	9.6%	36%
19	Israel	71.6	8.9%	-1.0%
24	Kuwait	68.3	43%	0.4%
25	United Arab Emirates	66.1	9.1%	26%
75	Turkey	39.7	-2.5%	4.6%
76	Saudi Arabia	39.6	19%	62%
103	South Africa	29.6	-1.7%	81%
108	Kenya	26.4	8.9%	223%
112	Nigeria	24.3	4.2%	2.0%
121	Egypt	19.9	24%	-13%
122	Morocco	19.9	-13%	19%
126	Iran	17.7	-0.7%	44%
134	Namibia	14.3	7.6%	23%

Figure 34: Average Peak Connection Speed (IPv4) by Middle East & Africa Country

Global Rank	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
12	Israel	95%	-1.2%	0.3%
33	United Arab Emirates	90%	-0.7%	3.0%
49	Qatar	83%	4.7%	35%
55	Turkey	80%	-8.5%	2.7%
73	Kenya	64%	1.2%	1585%
83	Kuwait	50%	-7.9%	-32%
86	Saudi Arabia	49%	-4.5%	218%
88	Morocco	48%	9.6%	338%
92	South Africa	38%	-10%	103%
101	Iran	28%	-22%	563%
109	Egypt	19%	101%	622%
113	Nigeria	14%	-52%	-23%
115	Namibia	13%	27%	189%

Figure 35: 4 Mbps Broadband Adoption (IPv4) by Middle East & Africa Country

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
19	Qatar	56%	114%	285%
24	Israel	51%	-1.2%	13%
50	Kenya	22%	19%	7980%
52	United Arab Emirates	20%	-25%	34%
62	Turkey	13%	4.7%	80%
65	South Africa	10%	-23%	283%
66	Egypt	10%	497%	10117%
75	Saudi Arabia	4.5%	51%	1420%
79	Morocco	2.5%	81%	1801%
-	Kuwait	9.4%	21%	250%
-	Namibia	1.0%	68%	476%
-	Nigeria	0.9%	-36%	-4.9%

Iran

Figure 36: 10 Mbps Broadband Adoption (IPv4) by Middle East & Africa Country

4 Mbps — compared with seven countries in the previous quarter. However, the gap between the top- and bottom-ranked MEA countries narrowed from 86 percentage points to 81, as Egypt, the bottom-ranked country from the first quarter, enjoyed a 101% gain in adoption rates, and Namibia, the bottom-ranked country from the second quarter, posted a 27% increase. These were the two highest quarterly increases in the region, while three other countries saw modest single-digit gains in adoption and the remaining seven saw declines. Those quarterly declines ranged from 0.7% in the United Arab Emirates to 22% in Iran.

On a year-over-year basis, all of the surveyed MEA countries saw gains in 4 Mbps broadband adoption in the second quarter with the exception of Kuwait, just as in the first quarter. Kuwait posted a 32% decline. Kenya led the gaining countries with an amazing 1,585% yearly increase, while six additional countries saw adoption more than double compared with the second quarter of 2015. Israel had the smallest year-over-year increase in adoption at 0.3%.

7.4 / MEA 10 MBPS BROADBAND ADOPTION (IPv4) / Only nine MEA surveyed countries qualified for inclusion in the second quarter, down from ten in the first, as seen in Figure 36. With 56% of its IPs connecting to Akamai at average speeds of 10 Mbps or higher, Qatar had the highest adoption level among the qualifying surveyed MEA countries in the second quarter, overtaking firstquarter leader Israel after a tremendous 114% quarterly gain. Qatar and Israel were the only two countries in the region with adoption rates above 50% in the second quarter, and bottom-ranked Morocco posted an adoption rate of only 2.5%, 53 percentage points below Qatar. Iran, which was the bottom-ranked country in the first quarter, did not qualify for inclusion in the second quarter. Seven of the nine qualifying surveyed countries had at least one in ten of their unique IPv4 addresses connecting to Akamai at average speeds of 10 Mbps or higher in the second quarter, up from six in the first, and six countries saw quarterly gains in adoption, varying between Turkey's 4.7% and Egypt's 497%. However, the United Arab Emirates, South Africa, and Israel posted quarterly declines in adoption — of 25%, 23%, and 1.2% respectively.

0.3%

-17%

111%

Yearly changes were strongly positive across the board, led by Egypt with an impressive 10,117% yearly increase, followed by Kenya with a 7,980% increase. Morocco and Saudi Arabia also posted tremendous gains, of 1,801% and 1,420% respectively. However, as previously noted, all four of these countries did not qualify for inclusion in this metric one year ago, so their yearly percentage-change calculations can be misleading. South Africa and Qatar — both of which did qualify for inclusion one year ago — saw adoption levels increase by nearly 300% each compared with the second quarter of 2015. Israel had the smallest gain in the region at 13%.

7.5 / MEA 15 MBPS BROADBAND ADOPTION (IPv4) / In the second quarter, Saudi Arabia qualified for inclusion in this metric, increasing the total number of qualifying surveyed MEA countries to eight, as seen in Figure 37. With a significant 229% quarterly increase, Qatar became the leader in 15 Mbps adoption in the region, as its 31% adoption bested first-quarter leader Israel by 5 percentage points and beat last-place Saudi Arabia by more than 30 percentage points. Egypt, which held the bottom spot in the first quarter, enjoyed the biggest quarterly gain in the region as its adoption rate spiked 597%. In all, five qualifying countries posted gains, with Israel's 7.7% increase being the smallest. The remaining three countries had declines in adoption, ranging from 1.0% in Turkey to 26% in South Africa. Three of the qualifying surveyed MEA countries had more than one in ten unique IPv4 addresses connecting to Akamai at average speeds of at least 15 Mbps, up from one in the first quarter.

On a yearly basis, changes were strongly positive across the region. However, again note that the four countries with the largest yearly gains — Kenya, Egypt, Saudi Arabia, and Qatar (with gains ranging from 605% to 19,288%) — were all countries that did not qualify for inclusion in this metric in the second quarter of 2015, so their data from one year ago was likely too small to be informative. Increases among the remaining countries ranged from 44% in to 292% in South Africa.

Global Rank	Country/Region	% Above 15 Mbps	QoQ Change	YoY Change
22	Qatar	31%	229%	605%
31	Israel	26%	7.7%	44%
45	Kenya	11%	24%	19288%
50	South Africa	5.7%	-26%	292%
53	United Arab Emirates	5.1%	-11%	57%
55	Egypt	4.8%	597%	11236%
57	Turkey	4.2%	-1.0%	87%
67	Saudi Arabia	1.1%	113%	2115%
-	Kuwait	5.5%	3.1%	361%
_	Morocco	0.4%	84%	1225%
_	Nigeria	0.4%	-14%	31%
_	Namibia	0.2%	78%	368%
_	Iran	0.1%	9.7%	84%

Figure 37: 15 Mbps Broadband Adoption (IPv4) by Middle East & Africa Country



[SECTION]⁸ MOBILE CONNECTIVITY

he source data in this section encompasses usage from smartphones, tablets, computers, and other devices that connect to the Internet through mobile network providers. In addition, this section includes insight into mobile voice- and data-traffic trends contributed by Ericsson, a leading provider of telecommunications equipment and related services to mobile and fixed operators globally. Mobile connectivity metrics are aggregated at a country/region level.

8.1 CONNECTION SPEEDS ON MOBILE NETWORKS (IPv4) / Beginning with this quarter's report, the countries/regions covered in this section, along with their categorization, have been altered slightly to align with the rest of the *State of the Internet Report*. This section will now provide mobile data and analysis for the same surveyed countries/regions covered in Sections 4 through 7 of this report, and the countries/regions will be categorized in the same way: Americas, Asia Pacific, Europe, and Middle East/Africa. Countries/regions marked with an asterisk in the chart below have not met the minimum requirement of 25,000 unique IPv4 addresses seen by Akamai and

Note that the mobile speed measurements shown here – particularly average peak connection speeds — can be influenced by a number of factors, including the use and location of proxies within mobile networks. If a country's major mobile carriers make heavy use of such proxies, peak connection speeds recorded for that country are likely to be influenced by the speeds achieved between Akamai and the proxies (residing in data centers) rather than speeds achieved between Akamai and the average peak connection speeds recorded below are higher than one might expect given the current state of LTE and LTE-A deployment,⁴⁵ so it is likely that these speeds are affected — to differing degrees — by proxies within those countries' mobile provider networks and may not be fully representative of speeds being seen by end users.

In the second quarter of 2016, 58 surveyed countries/regions around the world qualified for inclusion in the mobile section. Figure 38 shows that across these countries/regions, the United Kingdom once again had the fastest average mobile connection speed at 23.1 Mbps (down from 27.9 Mbps in the first quarter), with Belgium in second place at 21.1 Mbps (up from 19.4 Mbps in the first). Venezuela had the lowest average connection speed at 2.2 Mbps, followed by Argentina and Vietnam, both with average connection speeds of 2.8 Mbps.

Among the qualifying surveyed countries/regions, 17 in total had an average mobile connection speed at or exceeding the 10 Mbps broadband threshold, while 48 achieved average speeds at or above the 4 Mbps broadband level. Within the individual continental regions, the following qualifying surveyed countries/regions had the highest average mobile connection speeds:

- Americas: Canada, 8.4 Mbps
- Asia Pacific: South Korea, 11.1 Mbps
- Europe: United Kingdom, 23.1 Mbps
- Middle East/Africa: United Arab Emirates, 8.4 Mbps

Average peak mobile connection speeds spanned an extremely broad range in the second quarter, from 16.1 Mbps in Bolivia to 172.8 Mbps in Germany. As mentioned above, the speeds on the upper end of this spectrum are higher than one might expect given the current state of LTE and LTE-A deployment and are likely to be influenced by mobile carriers' use of proxies within their networks. Proxy usage differs across carriers and can affect the measurements to varying degrees in different countries.

A total of five qualifying surveyed countries — Germany, Australia, Israel, Thailand, and the United Arab Emirates — recorded average peak speeds above 100 Mbps. Twenty-eight countries/regions posted average peak speeds above 50 Mbps, and 50 countries/ regions had average peak speeds exceeding 25 Mbps. Within the global regions, the following qualifying surveyed countries/regions had the highest average peak mobile connection speeds:

- Americas: Peru, 72.1 Mbps
- Asia Pacific: Australia, 171.2 Mbps
- Europe: Germany, 172.8 Mbps
- Middle East/Africa: Israel, 136.0 Mbps

In upcoming quarters, we expect to see mobile speeds continue to climb as 4G LTE becomes deployed more broadly worldwide. The second quarter saw several announcements of new 4G LTE service launches including Reliance Communications in India,⁴⁶ Digicel in Jamaica,⁴⁷ and Vodafone in Zambia.⁴⁸ In addition, a report published by the Global Mobile Suppliers Association (GSA) found that in May 2016, there were 503 carriers with LTE networks across 167 countries, serving approximately 1.3 billion subscribers — roughly twice as many subscribers as just one year prior. GSA expects the number of LTE networks to reach 550 by the end of the year.⁴⁹

Peak speeds on mobile networks will continue to grow as well, as networks begin to deploy LTE-A, a newer, faster version of LTE technology. In June, Sri Lanka demonstrated network speeds exceeding 1 Gbps on its Dialog Axiata network leveraging Huawei Technologies' LTE infrastructure.⁵⁰ The same month, having won a significant portion of the LTE bandwidth made available in South Korea's recent spectrum auction, sk Telecom, the country's largest wireless provider, launched new 500 Mbps LTE-A Pro service that is roughly seven times faster than original LTE speeds. By 2018/2019 sk Telecom expects to be able to offer speeds of up to 1 Gbps through this new service.⁵¹

8.2 MOBILE BROWSER USAGE DATA/In June 2012, Akamai launched the "Akamai 10" destination site (*http://www.akamai.com/io*), with an initial data set that highlighted browser usage across PCs and other devices connecting to Akamai via fixed and mobile networks. The data and graphs below are derived from Akamai 10. As seen in Figure 39 and Figure 40, data for the last eight days of the quarter has not been included in this report. We believe the data collected during these dates was not reliable due to changes made on June 23 in the system used to identify mobile devices. These changes were rolled back shortly after the end of the quarter. Thus, for all analysis in this section, end-of-quarter data will refer to data collected on June 22, and quarterly averages will include data from April 1 through June 22.

Figure 39 illustrates mobile browser usage by users identified to be on cellular networks in the second quarter of 2016. As of Android version 4.4 (KitKat), Chrome has replaced Webkit as the default Android browser engine, so when comparing Android versus iOS platforms, we combine metrics from Android Webkit and Chrome for mobile to calculate an Android platform number. Like last quarter, in the second quarter we saw Webkit traffic continue to decline and Chrome traffic continue to increase (albeit quite gradually) as older Android versions are retired.

AMERICAS Denmak 11.7 Argentina 2.8 24.4 Estonia* 9.4 Bolivia 3.3 16.1 Estonia* 9.4 Bolivia 3.3 16.1 Finland 15.6 Brail 3.9 19.9 France 12.7 Canada 8.4 6.75 Germany 17.0 Colombia 3.3 19.5 Hungary 9.6 Costa Rica* 3.2 6.18 Italy 10.0 Mexico* 6.5 108.1 Latvia* 11.1 Paraguay 5.2 40.6 Luxembourg* 11.1 Paraguay 3.1 2.2 2.3.1 Poland 11.8 Astrala<	Country/Region	Q2 2016 Avg. Mbps	Q2 2016 Peak Mbps	Country/Region	Q2 201 Avg. Mb
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Australia 8.9 171.2 Romania* 10.9 China 6.7 32.4 Russia 10.7 Hong Kong 5.7 50.3 Slovakia 13.3 India 3.3 19.5 Slovakia 13.3 Indonesia 6.9 46.3 Spain 13.1 Japan 9.5 93.2 Sweden 11.0 Malaysia 3.4 31.8 Switzerland * 19.3 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines * 8.5 105.1 MIDDLE EAST/AFRICA 10.0 Singapore 8.1 61.3 Egypt 6.7 South Korea 11.1 67.6 Iran 5.4 Sri Lanka 5.0 46.2 Israel 6.9 Taiwan 9.3 59.4 Kenya 5.5 EUROPE Vietnam 2.8 29.7 Morocco 5.5 Namibia 3.1 Nigeria * 3.0 <t< td=""><td>ASIA PACIFIC</td><td></td><td></td><td>Portugal *</td><td>7.3</td></t<>	ASIA PACIFIC			Portugal *	7.3
China 6.7 32.4 Russia 10.7 Hong Kong 5.7 50.3 Slovakia 13.3 India 3.3 19.5 Slovakia 13.3 Indonesia 6.9 46.3 Slovakia 13.3 Japan 9.5 93.2 Sveden 11.0 Malaysia 3.4 31.8 Switzerland * 19.3 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines * 8.5 105.1 Switzerland * 10.3 Singapore 8.1 61.3 Egypt 6.7 South Korea 11.1 67.6 Iran 5.4 Sri Lanka 5.0 46.2 Israel 6.9 Taiwan 9.3 59.4 Kenya 5.5 EUCOPE Morocco 5.5 Namibia 3.1 Nigeria * 3.0 Belgium 21.1 78.2 Saudi Arabia 4.4 South Africa	Australia	8.9	171.2	Romania *	10.9
Hong Kong 5.7 50.3 Slovakia 13.3 India 3.3 19.5 Slovenia 8.6 Indonesia 6.9 46.3 Slovenia 8.6 Japan 9.5 93.2 Slovenia 8.6 Malaysia 3.4 31.8 Sweden 11.0 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines * 8.5 105.1 MIDDLE EAST/AFRICA Egypt 6.7 Singapore 8.1 61.3 Egypt 6.7 Iran 5.4 Sri Lanka 5.0 46.2 Iran 5.4 Israel 6.9 Taiwan 9.3 59.4 Israel 6.9 7.4 Vietnam 2.8 29.7 Morocco 5.5 Nautria 11.6 46.8 Saudi Arabia 3.0 Belgium 21.1 78.2 Saudi Arabia 4.4 South Africa 4.9 5.0 4.4 South	China	6.7	32.4	Russia	10.7
India 3.3 19.5 Slovenia 8.6 Indonesia 6.9 46.3 Spain 13.1 Japan 9.5 93.2 Sweden 11.0 Malaysia 3.4 31.8 Sweden 11.0 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines * 8.5 105.1 MIDDLE EAST/AFRICA 5.0 Singapore 8.1 61.3 Egypt 6.7 South Korea 11.1 67.6 Iran 5.4 Taiwan 9.3 59.4 Israel 6.9 Kenya 5.2 Kuwait 7.4 Vietnam 2.8 29.7 Morocco 5.5 Namibia 3.1 Nigeria * 3.0 Belgium 21.1 78.2 Namibia 3.0 Bulgaria * 6.9 79.7 Saudi Arabia 4.4 South Africa 4.9 5.0 4.9 Cyprus * 20.0 81.2 <td>Hong Kong</td> <td>5.7</td> <td>50.3</td> <td>Slovakia</td> <td>13.3</td>	Hong Kong	5.7	50.3	Slovakia	13.3
Indonesia 6.9 46.3 Spain 13.1 Japan 9.5 93.2 Sweden 11.0 Malaysia 3.4 31.8 Sweden 11.0 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines* 8.5 105.1 MIDDLE EAST/AFRICA Egypt 6.7 Singapore 8.1 61.3 Egypt 6.7 South Korea 11.1 67.6 Iran 5.4 Sri Lanka 5.0 46.2 Iran 5.4 Taiwan 9.3 59.4 Kenya 5.2 Kuwait 7.4 Morocco 5.5 EUROPE Namibia 3.1 Austria 11.6 46.8 Nigeria* 3.0 Bulgaria* 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 Saudi Arabia 4.4 South Africa 4.9 Saudi Arabia 4.9 Czech Republic 7.3	India	3.3	19.5	Slovenia	8.6
Japan 9.5 93.2 Sweden 11.0 Malaysia 3.4 31.8 Switzerland * 19.3 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines * 8.5 105.1 MIDDLE EAST/AFRICA 23.1 Singapore 8.1 61.3 Egypt 6.7 South Korea 11.1 67.6 Iran 5.4 Sri Lanka 5.0 46.2 Israel 6.9 Taiwan 9.3 59.4 Kenya 5.2 EUROPE 7.4 Morocco 5.5 Rustria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Qatar * 12.6 Saudi Arabia 4.4 South Africa 4.9 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 United Arab Emirates 8.4	Indonesia	6.9	46.3	Spain	13.1
Malaysia 3.4 31.8 Switzerland * 19.3 New Zealand 9.8 97.7 United Kingdom 23.1 Philippines * 8.5 105.1 MIDDLE EAST/AFRICA 23.1 Singapore 8.1 61.3 Egypt 6.7 South Korea 11.1 67.6 Iran 5.4 Sri Lanka 5.0 46.2 Israel 6.9 Taiwan 9.3 59.4 Kenya 5.2 Thailand 5.8 127.7 Kuwait 7.4 Vietnam 2.8 29.7 Morocco 5.5 EUROPE 7.4 Morocco 5.5 Namibia 3.1 Nigeria * 3.0 Belgium 21.1 78.2 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.4	Japan	9.5	93.2	Sweden	11.0
New Zealand 9.8 97.7 Philippines * 8.5 105.1 Singapore 8.1 61.3 South Korea 11.1 67.6 Sri Lanka 5.0 46.2 Taiwan 9.3 59.4 Thailand 5.8 127.7 Vietnam 2.8 29.7 EUROPE Namibia 3.1 Austria 11.6 46.8 Bulgaria * 6.9 79.7 Croatia 7.2 32.9 Cyprus * 20.0 81.2 Czech Republic 7.3 30.0	Malaysia	3.4	31.8	Switzerland *	19.3
Philippines *8.5105.1MIDDLE EAST/AFRICASingapore8.161.3Egypt6.7South Korea11.167.6Iran5.4Sri Lanka5.046.2Israel6.9Taiwan9.359.4Kenya5.2Thailand5.8127.7Kuwait7.4Vietnam2.829.7Morocco5.5EUROPENamibia3.1Nigeria *3.0Austria11.646.8Qatar *12.6Bulgaria *6.979.7Saudi Arabia4.4Croatia7.232.9South Africa4.9Cyprus *20.081.2Turkey8.2Czech Republic7.330.0United Arab Emirates8.4	New Zealand	9.8	97.7	United Kingdom	23.1
Singapore8.161.3Egypt6.7South Korea11.167.6Iran5.4Sri Lanka5.046.2Iran5.4Taiwan9.359.4Kenya5.2Thailand5.8127.7Kuwait7.4Vietnam2.829.7Morocco5.5EUROPENamibia3.1Austria11.646.8Nigeria *3.0Belgium21.178.2Qatar *12.6Bulgaria *6.979.7South Africa4.4Croatia7.232.9South Africa4.9Cyprus *20.081.2United Arab Emirates8.4	Philippines *	8.5	105.1	MIDDLE EAST/AFRICA	
South Korea 11.1 67.6 Iran 5.4 Sri Lanka 5.0 46.2 Israel 6.9 Taiwan 9.3 59.4 Israel 6.9 Thailand 5.8 127.7 Kenya 5.2 Vietnam 2.8 29.7 Morocco 5.5 EUROPE Namibia 3.1 Austria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Qatar * 12.6 South Africa 4.4 South Africa 4.9 Croatia 7.2 32.9 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	Singapore	8.1	61.3	Egypt	6.7
Sri Lanka 5.0 46.2 Israel 6.9 Taiwan 9.3 59.4 Kenya 5.2 Thailand 5.8 127.7 Kuwait 7.4 Vietnam 2.8 29.7 Morocco 5.5 EUROPE 11.6 46.8 Nigeria * 3.0 Austria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Qatar * 12.6 Saudi Arabia 4.4 South Africa 4.9 Croatia 7.2 32.9 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	South Korea	11.1	67.6	Iran	5.4
Taiwan 9.3 59.4 Kenya 5.2 Thailand 5.8 127.7 Kuwait 7.4 Vietnam 2.8 29.7 Morocco 5.5 EUROPE Namibia 3.1 Nigeria * 3.0 Austria 11.6 46.8 Namibia 3.1 Belgium 21.1 78.2 Qatar * 12.6 Sudgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 Turkey 8.2 Cyprus * 20.0 81.2 Turkey 8.4	Sri Lanka	5.0	46.2	Israel	6.9
Thailand 5.8 127.7 Kuwait 7.4 Vietnam 2.8 29.7 Morocco 5.5 EUROPE Namibia 3.1 Austria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Oatar * 12.6 Sulgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 United Arab Emirates 8.4 8.4 8.4	Taiwan	9.3	59.4	Kenya	5.2
Vietnam 2.8 29.7 Morocco 5.5 EUROPE Namibia 3.1 Namibia 3.1 Austria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Qatar * 12.6 Sulgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 United Arab Emirates 8.4	Thailand	5.8	127.7	Kuwait	7.4
EUROPE Namibia 3.1 Austria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Qatar * 12.6 Bulgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 United Arab Emirates 8.4	Vietnam	2.8	29.7	Morocco	5.5
Austria 11.6 46.8 Nigeria * 3.0 Belgium 21.1 78.2 Qatar * 12.6 Bulgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	EUROPE			Namibia	3.1
Belgium 21.1 78.2 Qatar * 12.6 Bulgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	Austria	11.6	46.8	Nigeria *	3.0
Bulgaria * 6.9 79.7 Saudi Arabia 4.4 Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	Belgium	21.1	78.2	Qatar *	12.6
Croatia 7.2 32.9 South Africa 4.9 Cyprus * 20.0 81.2 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	Bulgaria *	6.9	79.7	Saudi Arabia	4.4
Cyprus * 20.0 81.2 Turkey 8.2 Czech Republic 7.3 30.0 United Arab Emirates 8.4	Croatia	7.2	32.9	South Africa	4.9
Czech Republic 7.3 30.0 United Arab Emirates 8.4	Cyprus *	20.0	81.2	Turkey	8.2
	Czech Republic	7.3	30.0	United Arab Emirates	8.4

Figure 38: Average and Average Peak Connection Speeds (IPv4) for Mobile Connections by Country/Region

* Fewer than 25,000 unique IPv4 addresses classified as mobile observed in Q2 2016

Q2 2016 Peak Mbps 45.2 48.6 94.7 58.2 172.8 50.8 47.6 60.1 72.9 50.2 36.2 105.5 98.0 52.0 57.5 51.7 94.1 114.8 80.2 59.9 29.5 64.3 49.2 159.9 62.4

> 24.9 29.8 136.0 20.3 74.8 32.3 38.3 59.0 103.0 30.2 33.1 85.6 102.4

As Figure 39 shows, in the second quarter of 2016 Chrome Mobile retained its position as the leading browser, although it gained very little ground. Mobile Safari requests comprised approximately 32% of requests over cellular at the beginning of the quarter, trailing Chrome Mobile by approximately 11 percentage points. Chrome also held a 26-point lead over Android Webkit. Over the quarter, Safari gained just half a percentage point, while Chrome gained one and a half and Webkit lost three. On June 22, Chrome was beating Safari by approximately 11.5 percentage points and besting Webkit by 30 percentage points.

In comparing iOS versus Android platforms, Android had a large lead over iOS in the second quarter but iOS gained a little ground. Android started the quarter with a 28 percentage point lead and ended 26 percentage points ahead. Overall, iOS comprised approximately 32% of requests in the second quarter, while Android was responsible for 59%.

Expanding the set of data to all networks (not just those defined as cellular), we see in Figure 40 that Mobile Safari commanded more share than Chrome once again, but its lead continued to narrow. At the start of the quarter, Mobile Safari usage was 5 percentage points higher than Chrome Mobile, but the gap narrowed to half of that





by the end of the quarter. Chrome Mobile began the quarter with an 18 percentage point lead over Android Webkit and ended with a 23-point lead, continuing the previous quarter's trend. Most of this change was due to Webkit's downward trend, while Safari and Chrome remained relatively steady throughout the quarter.

In comparing platforms, iOS started the second quarter with a 12 percentage point deficit compared with Android and ended it with an 11 point deficit. Averaged across the second quarter, iOS accounted for just over 39% of requests, while Android accounted for nearly 52% of requests.

8.3 MOBILE TRAFFIC GROWTH OBSERVED BY ERICSSON / In mobile networks, the access medium (spectrum) is shared by different users in the same cell. It is important to understand traffic volumes and usage patterns in order to enable a good customer experience. Ericsson's presence in more than 180 countries and its customer base representing more than 1,000 networks enable it to measure mobile voice and data volumes. The result is a representative base for calculating world total mobile traffic in 2G, 3G, and 4G networks (not including DVB-H, Wi-Fi, and Mobile WiMAX).

These measurements have been performed for several years. It is important to note that the measurements of data and voice traffic in these networks (2G, 3G, 4G/LTE) around the world show large differences in traffic levels between markets and regions and also between operators, due to their different customer profiles.

Mobile data traffic has continued to grow, and Figure 41 shows total global monthly data and voice traffic from the second quarter of 2011 to the second quarter of 2016. It depicts a continued strong increase in data-traffic and voice-traffic growth in the mid-single digits per year. The growth in data traffic is being driven both by increased smartphone subscriptions and a continued increase in average data volume per subscription, fueled primarily by increased viewing of video content. In the second quarter, data traffic grew 11% quarter over quarter and 55% year over year. Looking at the full five-year period shown in Figure 41, cumulative voice-traffic growth was only 42%, while cumulative data-traffic growth was just over 1,600%.





[SECTION]⁹ SITUATIONAL PERFORMANCE

he metrics presented here are based on data collected through Akamai's Real User Monitoring (RUM) capabilities, which take passive performance measurements from actual users of a web experience in order to provide insight into performance across devices and networks. RUM is a complementary capability to synthetic testing, and the two can and should be used together to gain a comprehensive picture of user experiences. Note that no personally identifiable information ("PH") is used to generate this data.

Figure 42 shows average page load times for users on both broadband and mobile connections based on RUM data collected by Akamai during the second quarter of 2016. The underlying data was collected using navigation timing⁵² (or "navtiming"), which allows JavaScript to collect page load time information directly from the user agent (browser) through an API. Navtiming is supported by most—but not all—of the browsers currently in use.⁵³ In particular, navtiming is not supported by Safari prior to version 8 on os x and version 9.0 on iOS, Android before version 4.0, Internet Explorer before version 9, or any version of the Opera Mini browser, so data from these devices will not be included below. Beginning with this quarter's report, the countries/regions covered in this section, along with their categorization, have been altered to align with the rest of the *State of the Internet Report*. Thus, this section now includes the same countries/regions surveyed in Sections 4 through 7 of this report, categorized in the same way: Americas, Asia Pacific, Europe, and Middle East/Africa. Countries/ regions marked with an asterisk in Figure 42 have not met the minimum requirement of having more than 90,000 measurements from mobile networks during the quarterly data collection period and do not qualify for inclusion. In the second quarter of 2016, 74 of the 75 surveyed countries/regions worldwide qualified for inclusion in this section, with Cyprus being the only exception. The inclusion criteria are subject to change in the future as we expand the scope of RUM measurements included within the *State of the Internet Report*.

In reviewing the average page load time measurements for broadband connections shown in Figure 42, we find the lowest values (i.e., fastest page load times) in Israel, with a 1.7-second average load time. The country with the slowest broadband page load time was Kenya, where pages took 6.2 seconds to load on average — more than 3.5 times as long as Israel — but a smaller multiplier than that seen between the fastest and slowest broadband page load times in the first quarter. Namibia and Venezuela had the next-slowest broadband page load times at close to 6 seconds each. Note that these measurements do not just reflect broadband network speeds but are also influenced by factors such as average page weight, page composition, and the Akamai customer content consumed by users within these countries.

Israel had the fastest average page load time for mobile networks as well, with pages loading in under 1.1 seconds. The next-fastest country, Thailand, was significantly slower with an average page load time of 2.1 seconds. At the other end of the spectrum, Nigeria had the highest average load times for mobile connections at 8.3 seconds, followed by Kenya at 7.9 seconds. Note again that all of these page load time measurements are affected by average page weight and page composition as well as mobile network speeds and may include content that is mobile-optimized.

In comparing the average broadband page load times to those observed on mobile connections, we again find significant variance in what we have dubbed the "mobile penalty" — that is, the ratio of average page load times on mobile connections versus average load times on broadband connections. As stated previously, this ratio should not be taken as a pure comparison of mobile versus broadband network speeds, as these speeds are just one factor in the overall user experience. Average page weight — which is dependent both on the type of content requested as well as potential mobile-specific content optimizations — is another significant factor.

In the second quarter, the mobile penalty across surveyed countries ranged from 0.6x in Israel to 2.4x in New Zealand, a similar variance to what was seen in the previous quarter. Of the 74 qualifying surveyed countries/regions, only six had a mobile penalty lower than 1.0x, meaning that average page load times were faster on mobile connections than on broadband connections. Note that many of the countries with lower mobile penalties are countries which may have underdeveloped fixed broadband infrastructure and depend heavily on mobile; as such, the content they are consuming may also be heavily optimized for the mobile experience, with aggressively slimmed-down content being delivered to mobile devices. On the other end of the spectrum, New Zealand was the only country to have a mobile penalty above 2.0. Hong Kong, Malta, India, and Japan had the next-highest penalties at 1.7x each. The average mobile penalty across all 74 qualifying countries was 1.3x, up from 1.2x in the first quarter.

Country/Region	Avg. Page Load Time Broadband (ms)	Avg. Page Load Time Mobile (ms)	Mobile Penalty	Country/Region	Avg. Page Load Time Broadband (ms)	Avg. Page Load Time Mobile (ms)	Mobile Penalty
AMERICAS	1	1		Estonia	2462	3306	1.3x
Argentina	4040	6034	1.5x	Finland	2388	3333	1.4x
Bolivia	4949	5622	1.1x	France	3351	3703	1.1x
Brazil	4453	5698	1.3x	Germany	2197	2656	1.2x
Canada	2982	4053	1.4x	Greece	3613	4151	1.1x
Chile	3469	3883	1.1x	Hungary	2196	2721	1.2x
Colombia	3574	5054	1.4x	Ireland	2722	3537	1.3x
Costa Rica	3552	4621	1.3x	Italy	4418	5383	1.2x
Ecuador	3911	5720	1.5x	Latvia	2786	3242	1.2x
Mexico	2511	2902	1.2x	Lithuania	2530	3310	1.3x
Panama	3190	4946	1.6x	Luxembourg	2449	2579	1.1x
Paraguay	5146	4738	0.9x	Malta	2760	4633	1.7x
Peru	3256	5096	1.6x	Netherlands	2117	2624	1.2x
United States	2758	3787	1.4x	Norway	2143	2706	1.3x
Uruguay	3576	4143	1.2x	Poland	2627	3230	1.2x
Venezuela	5972	7404	1.2x	Portugal	2662	3504	1.3x
ASIA PACIFIC				Romania	2410	3693	1.5x
Australia	4013	4912	1.2x	Russia	3021	4211	1.4x
China	2785	2636	0.9x	Slovakia	2360	2644	1.1x
Hong Kong	2262	3913	1.7x	Slovenia	2334	3193	1.4x
India	3707	6202	1.7x	Spain	2885	3734	1.3x
Indonesia	3244	3471	1.1x	Sweden	1785	2382	1.3x
Japan	2175	3618	1.7x	Switzerland	2192	2280	1.0x
Malaysia	3318	3154	1.0x	United Kingdom	3083	4280	1.4x
New Zealand	2299	5498	2.4x	MIDDLE EAST & AF	RICA		
Philippines	4854	7253	1.5x	Egypt	4097	3672	0.9x
Singapore	2025	2657	1.3x	Iran	3114	3242	1.0x
South Korea	1822	2626	1.4x	Israel	1680	1058	0.6x
Sri Lanka	4075	4857	1.2x	Kenya	6201	7854	1.3x
Taiwan	2183	3354	1.5x	Kuwait	5491	4197	0.8x
Thailand	2536	2134	0.8x	Morocco	4592	4908	1.1x
Vietnam	2918	4693	1.6x	Namibia	5981	7429	1.2x
EUROPE				Nigeria	5173	8272	1.6x
Austria	2408	3173	1.3x	Qatar	4788	5468	1.1x
Belgium	2137	2373	1.1x	Saudi Arabia	4237	6105	1.4x
Bulgaria	2384	3421	1.4x	South Africa	3647	4113	1.1x
Croatia	2768	4050	1.5x	Turkey	2798	4027	1.4x
Cyprus *	3452	4885	1.4x	United Arab	4676	5054	1 1 1
Czech Republic	2281	2891	1.3x	Emirates	4070	5054	1.1X
	1700	0/4/	4.5				

Figure 42: Average Page Load Times Based On Real User Monitoring

Denmark 1/92 2616 1.5x *Fewer than 90,000 measurements from mobile networks observed in Q2 2016.

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[SECTION]¹⁰ INTERNET DISRUPTIONS +EVENTS

nternet disruptions are unfortunately still all too common occurring in some countries/regions on a frequent basis. These disruptions may be accidental (backhoes or ship anchors severing buried fiber), natural (hurricanes or earthquakes), or political (governments shutting off Internet access in response to unrest or other local events, such as student testing). Because Akamai customer content is consumed by users around the world, the effect of these disruptions—whether brief or spanning multiple days—is evident in the levels of Akamai traffic delivered to the affected country/region.

The content presented in this section provides insight into how Akamai traffic was impacted by major Internet disruptions and events during the second quarter of 2016.

10.1 IRAQ / As seen in Figure 43, on several different dates throughout May and June, Akamai saw sudden drops in traffic to Iraq, generally lasting for three hours between either 2:00 a.m. to 5:00 a.m. or 3:00 a.m. to 6:00 a.m. UTC. The outages were due to government-ordered



Internet blackouts to prevent cheating on national middle and high school exams.⁵⁴ While traffic levels dropped to a small fraction of typical levels during this time, they did not drop to zero; Dyn Research's charts also corroborate that roughly one-third of the networks in Iraq remained online during the blackouts. Dyn Research noted these networks serve Kurdistan in northern Iraq, a region with an independent government that did not appear to be affected by the blackout. The Iraqi government has taken these extreme anti-cheating measures in the past, as noted in several previous issues of the *State of the Internet Report*.





10.2 SYRIA / Similar to the previous quarter, war-torn Syria suffered multiple Internet disruptions in the second quarter. As depicted in Figure 44 and Figure 45, Akamai saw numerous anomalous drops in traffic to Syria throughout the month of June. On June 4, at around 4:45 p.m. UTC, traffic suddenly dropped to less than 40% of previous

levels before gradually recovering over the next few hours, as Figure 44 illustrates. Syrian Telecom, the state-run telecommunications provider, reported the issue was caused by a "glitch" in one of the primary fiber cables.⁵⁵ Syria also faced numerous other Internet disruptions during the month, ranging from brief partial declines in



traffic to complete country-wide outages lasting for hours, as seen in Figure 45 and corroborated by Dyn Research.⁵⁶ The longest of these outages occurred on June 2, when Akamai traffic to Syria dropped to zero from approximately 5:00 a.m. to 7:50 a.m. UTC. Then, on June 7, 8, 9, 12, 13, 14, and 15, Akamai traffic to Syria dropped to nearly zero for some portion of the time between the hours of 3:00 a.m. and 5:00 a.m. On four of those dates, traffic stayed at nearly zero for almost those entire two hours. Finally, on June 19 and 20, Akamai traffic to Syria dropped to about one-third of previous levels at approximately 12:25 p.m. and 11:45 a.m. respectively. The cause of these various disruptions is unknown.

10.3 KENYA / At approximately 8:35 a.m. UTC on June 7, Akamai saw its traffic levels to Kenya drop in half, eventually recovering over the next several hours, as seen in Figure 46. This disruption occurred due to a nationwide power blackout caused by a lone monkey falling onto a transformer at one of Kenya's primary hydroelectric plants.³⁷ Power was restored to some areas within 15 minutes, although full restoration took four hours.

Region	Unique IPv4 Addresses	Average Connection Speed (Mbps)	Average Peak Connection Speed (Mbps)	% Above 4 Mbps	% Above 10 Mbps	% Above 15 Mbps
AMERICAS						
Argentina	8,477,276	5.2	31.8	52%	7.6%	1.7%
Bolivia	576,705	2.4	13.9	6.9%	0.5%	0.2%
Brazil	48,400,932	4.8	33.7	48%	5.1%	1.6%
Canada	15,224,673	13.7	60.6	90%	52%	30%
Chile	4,718,910	7.0	50.4	81%	14%	4.1%
Colombia	10,476,738	4.6	23.5	49%	3.2%	0.8%
Costa Rica	539,136	3.5	19.0	27%	1.3%	0.4%
Ecuador	752,395	5.1	32.2	54%	5.5%	1.4%
Mexico	13,318,901	7.4	35.2	80%	17%	4.5%
Panama	518,899	4.5	20.9	47%	3.3%	0.9%
Paraguay	234,005	2.0	12.6	6.6%	0.4%	0.1%
Peru	1,055,195	5.5	33.7	64%	7.3%	2.2%
United States	134,931,550	15.3	69.7	86%	56%	35%
Uruguay	1,058,850	6.5	63.8	73%	11%	3.0%
Venezuela	2,649,815	1.8	12.0	3.4%	0.2%	0.1%
ASIA PACIFIC						
Australia	9,903,083	8.5	51.1	75%	22%	9.7%
China	124,530,875	5.2	35.4	63%	4.3%	0.6%
Hong Kong	3,127,555	19.5	114.3	93%	66%	46%
India	17,353,922	3.6	26.1	25%	5.4%	2.0%
Indonesia	3,223,255	5.9	91.9	66%	8.2%	2.1%
Japan	45,466,153	17.1	85.3	92%	65%	42%
Malaysia	2,001,804	6.8	51.0	66%	16%	5.0%
New Zealand	2,081,214	10.6	53.8	90%	33%	16%
Philippines	1,443,740	4.3	32.9	33%	5.0%	2.1%
Singapore	1,762,021	17.2	157.3	93%	67%	45%
South Korea	24,768,294	27.0	110.1	97%	79%	63%
Sri Lanka	159,963	5.7	43.9	83%	6.2%	1.6%
Taiwan	10,086,145	15.6	88.8	93%	58%	34%
Thailand	3,408,172	13.7	77.6	96%	59%	30%
Vietnam	7,106,031	5.1	37.1	57%	6.4%	1.3%
EUROPE						
Austria	3,160,188	12.8	51.9	93%	39%	20%
Belgium	4,941,975	15.1	71.1	94%	64%	37%
Bulgaria	1,711,145	15.4	59.3	95%	64%	39%
Croatia	1,627,371	7.7	41.2	85%	16%	5.1%
Cyprus	374,729	6.7	27.8	79%	11%	3.1%
Czech Republic	1,835,537	16.5	63.4	89%	53%	32%

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Region	Unique IPv4 Addresses	Average Connection Speed (Mbps)	Average Peak Connection Speed (Mbps)	% Above 4 Mbps	% Above 10 Mbps	% Above 15 Mbps
Denmark	3,020,829	16.3	59.7	95%	59%	38%
Estonia	528,397	11.6	54.0	90%	40%	20%
Finland	2,569,087	17.6	60.2	92%	58%	36%
France	31,014,271	9.6	40.5	76%	26%	14%
Germany	37,210,519	14.1	55.7	91%	47%	27%
Greece	3,400,521	7.5	32.5	86%	14%	4.1%
Hungary	2,856,292	13.4	65.0	94%	50%	27%
Ireland	2,085,869	13.9	59.5	81%	44%	28%
Italy	16,463,220	8.2	39.4	81%	19%	7.9%
Latvia	808,356	17.5	77.7	95%	62%	41%
Lithuania	1,260,838	14.7	52.3	91%	47%	32%
Luxembourg	183,871	10.1	58.9	88%	28%	14%
Malta	180,455	12.8	57.2	97%	55%	27%
Netherlands	9,212,303	17.0	72.5	96%	63%	38%
Norway	3,364,877	20.1	69.0	92%	64%	48%
Poland	7,715,931	12.2	54.1	90%	41%	22%
Portugal	3,684,270	12.9	53.4	88%	48%	30%
Romania	3,544,594	15.8	84.2	95%	62%	42%
Russia	18,889,407	12.3	64.4	91%	50%	25%
Slovakia	1,005,285	12.3	54.4	87%	34%	19%
Slovenia	1,075,852	14.6	52.9	89%	42%	24%
Spain	15,766,797	14.1	70.7	91%	50%	32%
Sweden	6,163,570	18.8	78.1	94%	57%	41%
Switzerland	3,679,066	18.3	76.1	95%	65%	42%
United Kingdom	30,941,963	15.0	62.1	90%	53%	36%
MIDDLE EAST & AFRICA						
Egypt	8,843,240	4.0	19.9	19%	10%	4.8%
Iran	8,635,093	3.2	17.7	28%	0.3%	0.1%
Israel	2,605,265	13.4	71.6	95%	51%	26%
Kenya	2,328,300	7.7	26.4	64%	22%	11%
Kuwait	599,088	6.8	68.3	50%	9.4%	5.5%
Morocco	4,700,498	4.4	19.9	48%	2.5%	0.4%
Namibia	220,466	2.4	14.3	13%	1.0%	0.2%
Nigeria	220,199	2.9	24.3	14%	0.9%	0.4%
Qatar	329,786	13.0	97.8	83%	56%	31%
Saudi Arabia	3,842,283	4.7	39.6	49%	4.5%	1.1%
South Africa	6,007,149	5.6	29.6	38%	10%	5.7%
Turkey	8,788,384	7.0	39.7	80%	13%	4.2%
United Arab Emirates	1,445,935	8.0	66.1	90%	20%	5.1%

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