VOLUME 5, NUMBER 3

The State of the Internet

3RD QUARTER, 2012 REPORT

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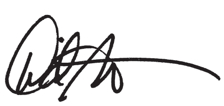
Letter From the Editor

With all of the focus on measuring Internet connection speeds, and with the increasing focus on a shift to mobile/wireless Internet connectivity, there is often little thought given to how these connections actually happen — that is, from a physical perspective, how do bits flow between Internet-connected devices? Early in the third quarter, I read a book entitled *Tubes: A Journey to the Center of the Internet*. Written by journalist Andrew Blum, the book explores the physical components of the Internet, starting with the home router, and branching out to local fiber, submarine cables, massive data centers, peering points, and more — all of the things that we don't normally think about until something goes catastrophically wrong. In my opinion, Blum's descriptions are sufficiently technical so as not to bore someone familiar with such infrastructure, while remaining approachable for a less technical audience as well. If you're interested in learning more about these critical infrastructure components that make the Internet work, I'd suggest picking up a copy of the book — find out more at http://andrewblum.net/#tubes-book.

To that end, the submarine cables highlighted in Blum's book continue to play an increasingly important role in international Internet connectivity. Data released[1] in September by network research firm Telegeography noted that international Internet bandwidth continues to grow rapidly, more than doubling between 2010 and 2012, and up approximately 4x between 2008 and 2012, to 77 Tbps. While this growth is not all due to the broader deployment of submarine cables, these connections have been instrumental in improving Internet connectivity and increasing available bandwidth to many countries around the world that had previously been underserved.

While the physical "tubes" of mobile Internet connections are clearly less obvious, they are no less important in keeping the bits flowing for this increasingly popular method of connectivity. A report[2] published in September by the United Nations Commission for Digital Development noted that mobile broadband connections significantly outnumber fixed home broadband connections, and highlighted the importance of mobile Internet connectivity in the developing world, as well as its importance to the emerging "Internet of Things." In the United States, the Federal Communications Commission announced[3] plans to develop a new program to measure mobile broadband service performance, building on the methods and approaches developed as part of the Measuring Broadband America program.

Next quarter's report will mark the fifth full year of the *State of the Internet Report*. In it, I plan to explore trends seen not only during 2012, but also over the past five years — what countries/regions have seen the most significant improvements, and have there been any trends that were unexpected?



– David Belson

Executive Summary

Akamai's globally distributed Intelligent Platform allows us to gather massive amounts of information on many metrics, including connection speeds, attack traffic, network connectivity/availability/latency problems, and IPv6 growth/transition progress, as well as traffic patterns across leading Web sites and digital media providers. Each quarter, Akamai publishes the *State of the Internet Report*. This report includes data gathered from across the Akamai intelligent Platform during the third quarter of 2012 about attack traffic, broadband adoption, and mobile connectivity, as well as trends seen in this data over time. In addition, this quarter's report includes insight into "Operation Ababil" attacks, the state of IPv6 adoption as measured by Hurricane Electric along with perspectives on the U.S. government's IPv6 deadline, and observations from Akamai partner Ericsson comparing application traffic on 2G and 3G networks.

Security

During the third quarter of 2012, Akamai observed attack traffic originating from 180 unique countries/regions. China remained far and away the top traffic source, responsible for nearly a third of observed attack traffic. The United States and Russia held the second and third place spots respectively, accounting for just below 18% of observed attack traffic combined. Attack traffic concentration increased from the second quarter of 2012, with the top 10 ports seeing 72% of observed attack traffic. Towards the end of the third quarter, a set of distributed denial-of-service (DDoS) attacks targeted the Web sites of banks and other financial institutions. Among the attacks that targeted Akamai customers, we observed total traffic levels as high as 65 Gbps, with nearly a third of that targeting DNS infrastructure. Much of the balance of the attack traffic was related to attempts to overwhelm Web servers with requests for legitimate static Web pages, as well as for dynamically generated content.

Internet and Broadband Adoption

Akamai observed a 2.7% quarterly increase in the number of unique IP addresses connecting to Akamai, growing to over 683 million, approximately 18 million more than were seen in the second quarter. Looking at connection speeds, the global average connection speed declined 6.8% to 2.8 Mbps, and the global average peak connection speed declined 1.4% to 15.9 Mbps. At a country level, South Korea had the highest average connection speed at 14.7 Mbps (up 3.3% quarter-over-quarter), while Hong Kong once again recorded the highest average peak connection speed at 54.1 Mbps (up 9.9% quarter-over-quarter). Globally, high broadband (>10 Mbps) adoption grew 8.8% in the third quarter to 11%, and South Korea remained the country with the highest level of high broadband adoption, at 52% (up 7.8% quarter-over-quarter). Global broadband (>4 Mbps) adoption grew 4.8% to reach 41%, with South Korea leading this metric as well, with a broadband adoption level of 86% (up 3.3% quarter-over-quarter). Note that we are no longer including figures for narrowband (<256 kbps) adoption, nor city-level data.

Mobile Connectivity

In the third quarter of 2012, average connection speeds on surveyed mobile network providers ranged from a high of 7.8 Mbps down to 324 kbps. Average peak connection speeds for the quarter ranged from 39.2 Mbps down to 2.8 Mbps. Based on data collected by Ericsson, the volume of mobile data traffic doubled from the third quarter of 2011 to the third quarter of 2012, and grew 16% between the second and third quarter of 2012.

Analysis of Akamai IO data collected across the third quarter of a sample of requests to the Akamai Intelligent Platform indicates that for users of mobile devices on cellular networks, the largest percentage of requests (37.6%) came from Android Webkit, with Apple's Mobile Safari close behind (35.7%). However, for users of mobile devices across all networks (not just cellular), Apple's Mobile Safari accounted for 60.1% of requests, with Android Webkit responsible for just 23.1%.

SECTION 1: Security

Akamai maintains a distributed set of agents deployed across the Internet that monitor attack traffic. Based on data collected by these agents, Akamai is able to identify the top countries from which attack traffic originates, as well as the top ports targeted by these attacks. (Ports are network-level protocol identifiers.) This section provides insight into port-level attack traffic, as observed and measured by Akamai, during the third quarter of 2012. It also provides observations on "Operation Ababil" attacks that targeted Akamai customers. Due to changes in the back-end data gathering systems, this quarter's report does not include insight into client-side SSL ciphers as observed by Akamai—we expect that this data will return in 2013.

1.1 Attack Traffic, Top Originating Countries

During the third quarter of 2012, Akamai observed attack traffic originating from 180 unique countries/regions, down from 188 in the prior quarter. As shown in Figure 1, China overwhelmingly remained the source of the largest volume of observed attack traffic, accounting for nearly a third of the total, double the percentage observed in the second quarter. The United States remained in second place with a slight increase, originating 13% of observed attacks in the third quarter. The top 10 countries/regions remained unchanged quarter-over-quarter, with seven of them maintaining their positions on the list—Turkey, Russia and Taiwan were the only ones seeing movement. In terms of quarterly changes, only the United States and China saw increases, as noted above. China's growth from the second quarter was fairly significant, and somewhat surprising.

Digging into the underlying data, it appears that for the top ports targeted by attacks observed to be originating in China, the number of attacks remains fairly high. However, for the other countries on the list, attack counts decline sharply after the top one or two targeted ports.

In examining the regional distribution of observed attack traffic in the third quarter, we find that nearly 51% originated in the Asia Pacific/Oceania region, just under 25% in Europe, just over 23% in North and South America, and slightly more than 1% from Africa. In contrast to the decline seen in the second quarter, the Asia Pacific/Oceania region was the only one where any meaningful increase was seen in the third quarter, owing primarily to a doubling of the percentage of attack traffic observed to be originating from China.

	Country	Q3 '12 % Traffic	Q2 '12 %
1	China	33%	16%
2	United States	13%	12%
3	Russia	4.7%	6.3%
4	Taiwan, Province Of China	4.5%	5.4%
5	Turkey	4.3%	7.6%
6	Brazil	3.8%	4.6%
7	Romania	2.7%	3.5%
8	India	2.5%	2.9%
9	Italy	1.7%	2.1%
10	South Korea	1.5%	2.1%
–	Other	28%	37%

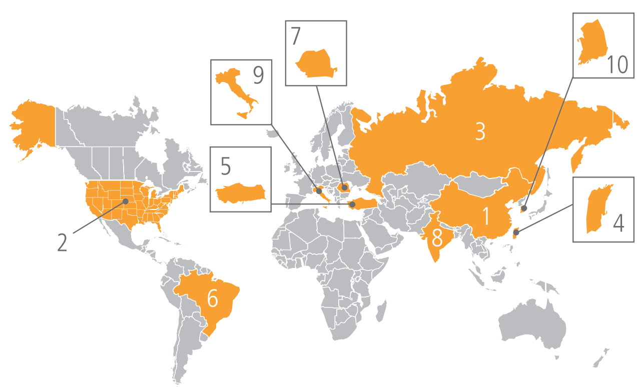


Figure 1: Attack Traffic, Top Originating Countries

Port	Port Use	Q3 '12 % Traffic	Q2 '12 %
445	Microsoft-DS	30%	32%
23	Telnet	7.6%	9.2%
1433	Microsoft SQL Server	4.9%	4.5%
3389	Microsoft Terminal Services	4.9%	4.2%
80	WWW (HTTP)	3.0%	3.8%
22	SSH	2.3%	2.2%
135	Microsoft-RPC	2.0%	1.9%
8080	HTTP Alternate	1.7%	1.9%
3306	MySQL	1.3%	0.9%
443	SSL (HTTPS)	1.1%	0.8%
Various	Other	41%	–

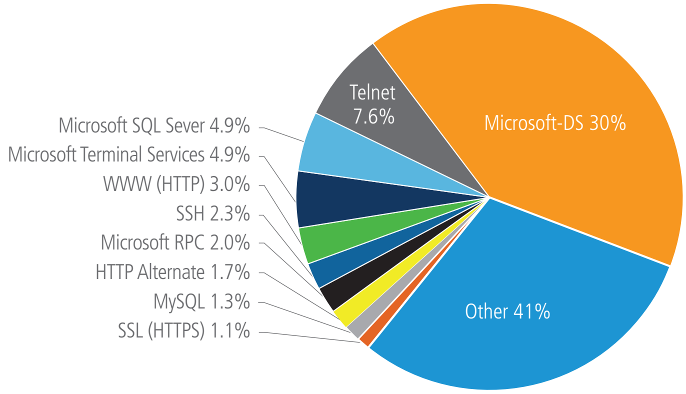


Figure 2: Attack Traffic, Top Ports

1.2 Attack Traffic, Top Ports

As shown in Figure 2, attack traffic concentration among the top 10 ports once again declined during the third quarter of 2012, with these ports responsible for 59% of observed attacks, down from 62% in the second quarter, and 77% in the first quarter. The percentage of attacks targeting Port 445 once again dropped quarter-over-quarter, though not quite as significantly as seen between the first and second quarters.

Port 445 remained the most targeted port in eight of the top 10 countries, accounting for as many as 109 times (in Romania) the number of attacks seen by the next most targeted port. (Within Romania, the concentration appears to be increasing over time, growing from 85x in the second quarter.) Port 23 remained the most targeted port in observed attacks originating from Turkey, with just under five times as many attacks targeting that port than Port 445, the next most targeted port. In China, Port 1433 was once again the most targeted port, with just under 1.6 times as many attacks targeting that port as Port 3389, the next most targeted port for attacks observed to be originating from the country. Port 23 was the second-most targeted port among the top countries/regions, ranking second in Russia, Taiwan, Romania, and India. In the United States and Brazil, Port 80 drew the second most number of attacks, while in China and South Korea, it was Port 3389.

DID YOU KNOW?

- For at least the last year, Port 23 (Telnet) has been the top targeted port for attacks observed to be originating in Turkey.
- China has been consistently responsible for the largest percentage of observed attacks since Q4 2011.
- Port 445 (Microsoft-DS) has been the top targeted port since the *2nd Quarter, 2008 State of the Internet Report.* (Port 135 held the top spot in the first published report.)

1.3 Operation Ababil

On September 18, 2012, a group calling itself the "Mrt. Izz ad-Din al-Qassam Cyber Fighters" posted a proclamation to Pastebin.com[4] that it would be attacking a series of United States banks. These attacks were claimed to be in response to the controversial movie "Innocence of Muslims," which also sparked violent protest across the Middle East. The stated goal of the attackers was to continue impacting the operations of banks and other financial institutions until the movie was removed from the Internet. These attacks were labeled "Operation Ababil" by the attackers.

The pattern of the attacks was consistent throughout the series of offenses: a post was released each Monday on Pastebin.com stating which banks would be targeted, and the attacks started on Tuesday, continuing through Thursday evening. The first series of attacks ("Phase I") occurred between September 18 and October 28, 2012, while a second round of attacks ("Phase II") were called for, and started, the week of December 10, 2012.

Akamai was involved in protecting some of the banks and financial institutions that were targeted by Operation Ababil. As a result, Akamai observed attacks with the following characteristics:

- Up to 65 gigabits per second (Gbps) of total attack traffic that varied in target and technique.
- A significant portion (nearly 23 Gbps) of the attack traffic was aimed at the Domain Name System (DNS) servers that are used for Akamai's Enhanced DNS services.
- Attack traffic to Akamai's DNS infrastructure included both UDP and TCP traffic which attempted to overload the servers and the network in front of them with spurious requests.
- The majority of the attack traffic requested legitimate Web pages from Akamai customer sites over HTTP & HTTPS in an attempt to overload the Web servers.
- Some attack traffic consisted of 'junk' packets that were automatically dropped by Akamai servers.
- Some attack traffic consisted of HTTP request floods to dynamic portions of sites such as branch/ATM locators and search pages.

While the attackers claimed to be hacktivists protesting a movie, the attack traffic seen by Akamai is inconsistent with this claim. The amount of attack traffic that was seen during these attacks was roughly 60 times larger than the greatest amount of traffic that Akamai had previously seen from other activist-related attacks. Additionally, this attack traffic was much more homogenous than we had experienced before, having a uniformity that was inconsistent with previous hacktivist attacks.

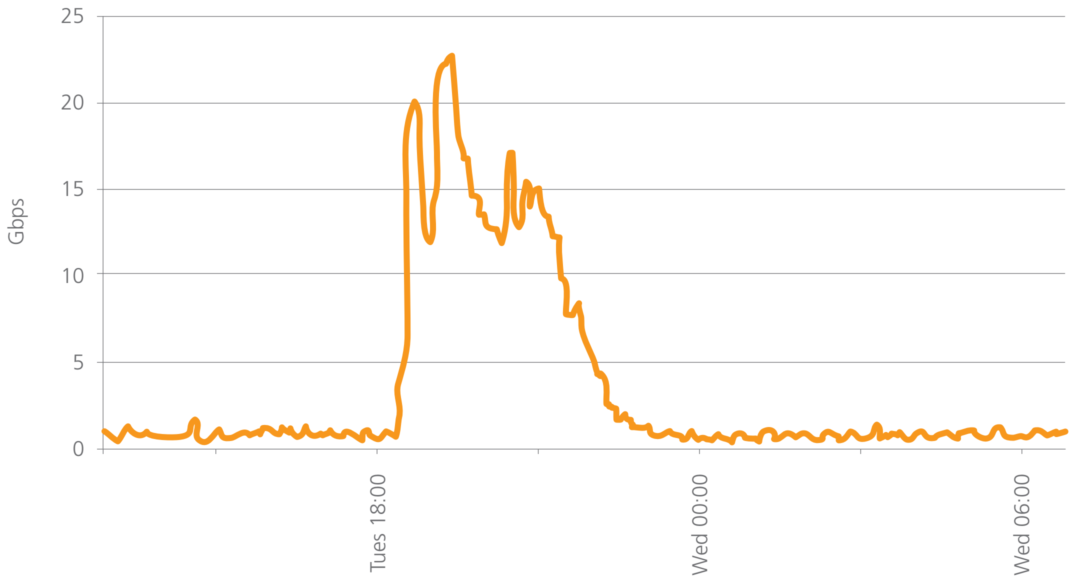


Figure 3: Incoming DNS Traffic (Gbps) Seen By Akamai's EDNS Service During An Ababil Attack

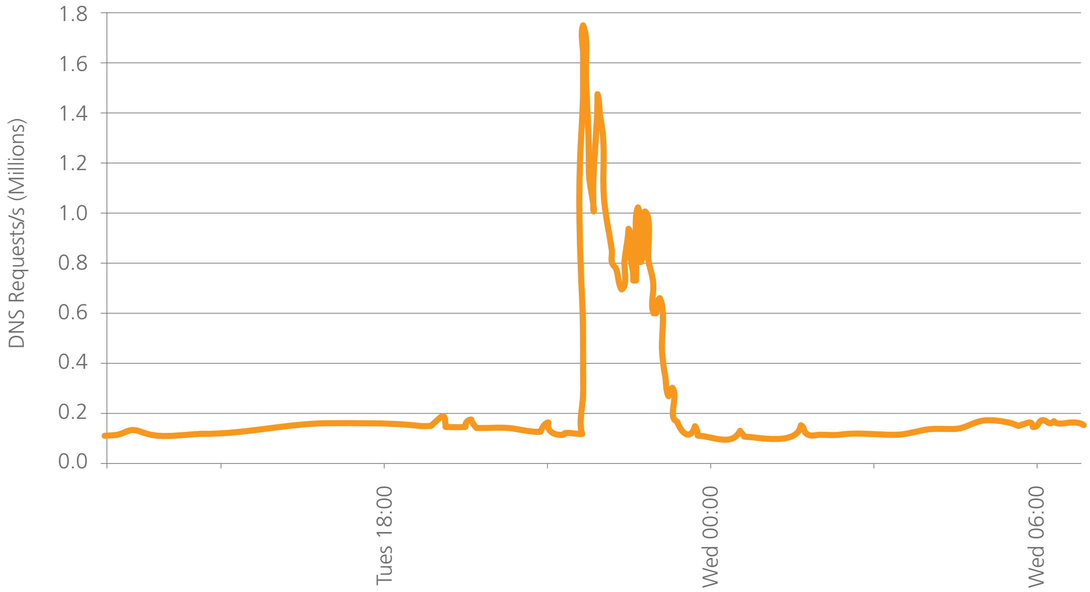


Figure 4: Incoming DNS Traffic (Requests Per Second) Seen By Akamai's EDNS Service During An Ababil Attack

enous than we had experienced before, having a uniformity that was inconsistent with previous hacktivist attacks.

After investigation, it was discovered that the attacking nodes were members of a botnet consisting of compromised servers running "itsoknoproblembro" and other toolkits. This botnet is now referred to as "BroBot." By being built from Web servers, BroBot exhibits the characteristics of high bandwidth per node and simplified command and control (C2), meaning that the attackers can bring a large volume of attack traffic to the intended target in a small amount of time. As shown in Figure 3 and Figure 4, the DNS traffic for one DDoS attack in Operation Ababil rapidly reached peak strength of nearly 23 Gbps and 1.7 million requests per second. The ability to rapidly grow the strength of the attack demonstrates very efficient BroBot command and control.

Akamai advises customers to take the following steps to protect their infrastructure from these types of attack:

- Protect their DNS: DNS is a critical service because when it fails, all other services fail (by essentially becoming unreachable). Akamai offers the Enhanced DNS (EDNS) service that uses the redundancy and availability of the Akamai platform to ensure uninterrupted resolution of customer hostnames.
- Protect against network-layer attacks: Network attacks attempt to flood the inbound connections into a target's datacenter with overwhelming amounts of traffic. Akamai mitigates this by having a massive deployment footprint and load-balancing between servers, locations, and geographies.
- Protect the default page: A default page is the home page where the path ends in a "trailing slash" (for example, http://www.akamai.com/) that Web users see when they first come to your site. This is the page most commonly attacked in a DDoS and can be easily protected with basic caching.
- Protect redirect or splash pages: Splash pages are a special page such as a custom 404, maintenance, or typo page that gives Web users information, or redirects them to where the content is located. Often, these pages receive attack traffic destined for the default page, and can also be protected by basic caching.
- Protect dynamic sites: In those situations where caching is not a viable option, Akamai offers both rate controls to limit the amount of requests that an attacker can send and "waiting room" capabilities that can park traffic and keep legitimate users engaged while at the same time alleviating pressure on back-end applications. For some customers, we can also put these sites behind a user validation wall that requires users to log in to use the dynamic functionality.

2.1 Unique IPv4 Addresses

Through its globally-deployed Intelligent Platform, and by virtue of the approximately two trillion requests for Web content that it services on a daily basis, Akamai has unique visibility into levels of Internet penetration around the world. In the third quarter of 2012, over 683 million IPv4 addresses, from 243 countries/regions, connected to the Akamai Intelligent Platform — 2.7% more than in the second quarter of 2012 and 11% more than in the third quarter of 2011. Although we see more than 600 million unique IPv4 addresses, Akamai believes that we see well over one billion Web users. This is because, in some cases, multiple individuals may be represented by a single IPv4 address (or a small number of IPv4 addresses), because they access the Web through a firewall or proxy server. Conversely, individual users can have multiple IPv4 addresses associated with them due to their use of multiple connected devices. Unless otherwise specified, the use of "IP address" within Section 2.1 refers to IPv4 addresses.

As shown in Figure 5, the global unique IP address count more than reversed the slight decline seen last quarter, growing 2.7% quarter-over-quarter, adding just over 18 million addresses. Quarterly growth was also seen among eight of the top 10 countries, while unique IP address counts in the United Kingdom and France declined slightly from the first quarter. It is not clear what caused these declines, though similar minor declines have been seen across the top countries from time to time. Such declines tend to manifest themselves as quarterly anomalies, and we do not believe that they point to any sort of real declines in Internet usage within these countries. Looking at the full set of countries around the world, just over 58% saw a quarterly increase, with 29 of them seeing increases of 10% or more.

Looking at year-over-year changes, seven of the top 10 countries had higher unique IP address counts as compared to the third quarter of 2011, with five of them growing more than 10% year-over-year. However, the United States again saw a very slight decline over time, as did South Korea, while the long-term decline seen in Japan was more significant. As noted previously, these longer-term negative trends could be due to a number of possible causes, including ongoing changes to data in Akamai's EdgeScape IP geolocation database, shifts in IP address block utilization by local network service providers, increased use of proxies, or deployment of so-called "large scale NAT" (network address translation) infrastructure by carriers in an effort to conserve limited IPv4 address space. On a global basis, however, over 80% of countries had higher unique IP address counts year-over-year. Among those that saw declines, the largest losses were generally seen in geographies with comparatively smaller address counts — low enough that they do not qualify for inclusion in subsequent sections.

	Country/Region	Q3'12 Unique IP Addresses	QoQ Change	YoY Change
–	Global	683,283,704	2.7%	11%
1	United States	145,002,042	1.5%	-0.2%
2	China	98,959,738	5.7%	21%
3	Japan	40,293,015	1.0%	-8.4%
4	Germany	36,529,907	0.9%	6.0%
5	United Kingdom	26,416,728	-0.6%	18%
6	France	25,585,394	-2.0%	5.9%
7	Brazil	22,554,472	4.7%	39%
8	South Korea	19,771,924	0.5%	-0.6%
9	Italy	18,180,191	1.2%	27%
10	Russia	16,056,368	3.8%	23%

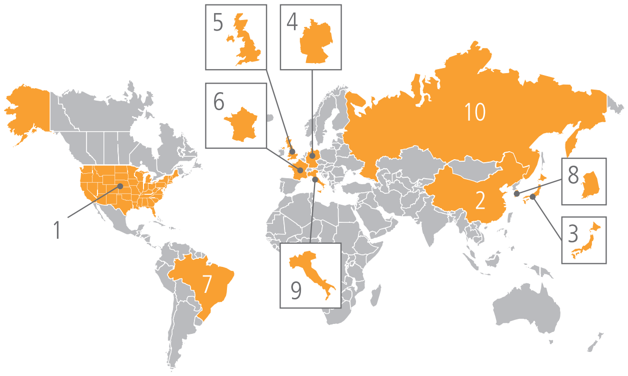


Figure 5: Unique IPv4 Addresses Seen By Akamai

2.2 IPv4 Exhaustion

The number of available IPv4 addresses continued to decline during the third quarter of 2012, as Regional Internet Registries continued to assign/allocate blocks of address space to requesting organizations within their respective territories.[5] Based on data published by the RIRs[6], Figure 6 compares IPv4 address assignment/allocation activity by RIR during the third quarter of 2012.

One clear observation from Figure 6 is that rate of consumption by RIPENCC (the European RIR) climbed steadily throughout most of the quarter, but then plateaued during the second week of September. This coincides with the September 14 milestone of RIPENCC reaching its last "/8" block of IPv4 addresses (a /8 is equivalent to 16,777,216 IPv4 addresses.) According to a statement[7] from RIPENCC, ongoing assignments of IPv4 address space would be more limited/restrictive, as was noted in previously published policies.[8] The importance of adopting IPv6 was underscored as well, with the statement noting "It is now imperative that all stakeholders deploy IPv6 on their networks to ensure the continuity of their online operations and the future growth of the Internet."

Within the Americas region, ARIN's consumption also grew fairly steadily throughout the quarter, though at a less aggressive rate than seen in Europe. The most significant jump seen during the quarter occurred on September 18, when a "/11" block (~2 million) of IPv4 addresses were allocated to T-Mobile USA, according ARIN records.[9] On that date, ARIN also announced[10] that it now had "three /8s of available space in its inventory and has moved into Phase Two of its IPv4 Countdown Plan." Phase Two of the ARIN IPv4 Countdown Plan implements some additional reviews[11] for IPv4 address requests larger than a "/16" (65,536 IPv4 addresses).

Having entered "austerity mode" in early 2011, APNIC's consumption velocity remained fairly low throughout the third quarter, assigning/allocating just over 550,000 IPv4 addresses in total. AFRINIC's consumption velocity was also fairly low, though steady, during the third quarter, with the RIR assigning just over 760,000 IPv4 addresses in total. With the exception of a single large allocation on August 23, LACNIC's consumption velocity was otherwise fairly low during the third quarter as well. This allocation was for a "/11" block (~2 million) of IPv4 addresses, and was made to NET Serviços de Comunicação S.A, according to LACNIC records.[12]

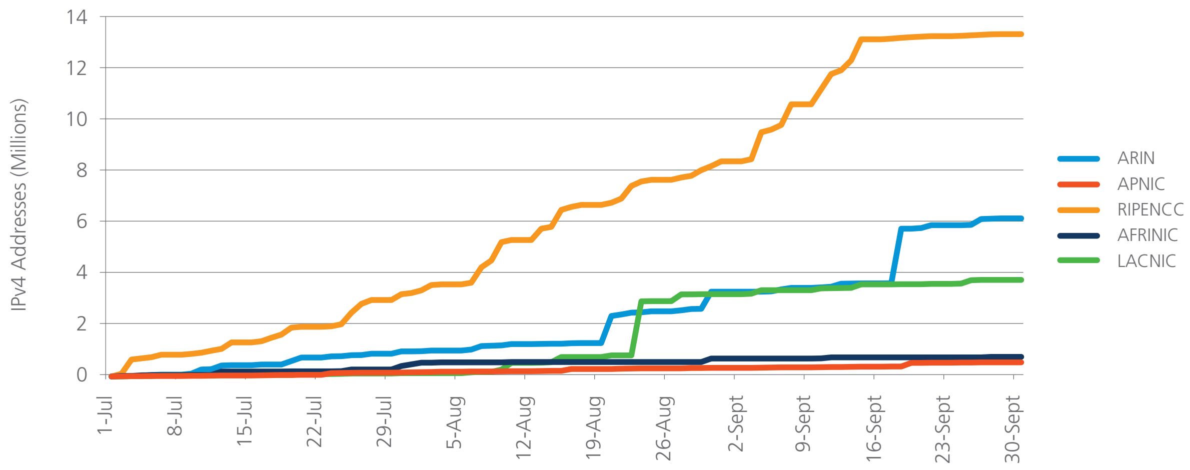


Figure 6: Total Number of IPv4 Addresses Assigned/Allocated by RIRs, Q3 2012

2.3 IPv6 Adoption

As Akamai continues to roll out IPv6 support across its solution portfolio, we will endeavor to include data in the *State of the Internet Report* on IPv6 adoption based on the analysis of IPv6 requests to, and traffic delivered by, the Akamai Intelligent Platform. However, until such time as we can include comprehensive Akamai data on IPv6 adoption, we have looked to third-party data.

For the last year, we have included insight into IPv6 adoption over time based on data from network service provider Hurricane Electric, which provides Internet transit, Web hosting, and collocation services and notes that it is "considered the largest IPv6 backbone in the world as measured by number of networks connected."[13] A white paper[14] available from Hurricane Electric notes that it has operated IPv6 network elements since 2000 and that it implemented extensive native IPv6 peering in early 2006 as a result of a core router and backbone upgrade. Hurricane Electric also publishes the output of a set of measurement tools on its "Global IPv6 Deployment Progress Report" page, available at http://bgp.he.net/ipv6-progress-report.cgi.

Due to an issue with the data collection system at Hurricane Electric, data for the third quarter is incomplete, though the available data has been included in Figure 7. The figure illustrates the growth in the number of ASes in the global IPv6 routing table during the third quarter of 2012, comparing it to the third quarters of the previous three years as well. Due to the limited data for 2012, comparisons to prior years are done as of August 23 (the last day that data is available for), rather than the end of the quarter. As shown in the figure, the growth rate for this portion of third quarter of 2012 was 3.8%. Similar to observations made in the second quarter, this growth rate was lower than those seen in this portion of the third quarter in 2011 (5.3%), 2010 (7.2%), and 2009 (8.8%). With respect to the number of ASes added to the IPv6 routing table during the period, the count seen in 2012 (220 ASes) was slightly lower than that seen during the same period in 2011 (227 ASes).

Unfortunately, due to missing data, it is impossible to know if the overall growth rate for the complete third quarter would ultimately eclipse 2011's.

As we have noted previously, while the "IPv6 ASes" metric provides some perspective around IPv6 adoption, it is also important to recognize that not all autonomous systems are equivalent. That is, IPv6 adoption on an autonomous system that is associated with a large number of end users/subscribers is ultimately more meaningful and impactful for measuring the ultimate success of IPv6 than adoption by an autonomous system that is not directly associated with end user connectivity/traffic.

September 30, 2012, marked the deadline for U.S. federal government agencies to make their public Web services available over IPv6, according to an Obama administration mandate[15] established two years ago. However, not all agencies met this deadline, as testing done by the National Institute of Standards & Technology (NIST) showed. An article published on GCN.com noted "According to a Sept. 30 snapshot from the National Institute of Standards and Technology's IPv6 dashboard, 16 percent of 1,494 .gov domains scanned had enabled IPv6, 37 percent were in progress and 47 percent had not made any progress."[16] Figure 8 shows the number of U.S. government domains that had enabled IPv6—as seen in the graph, there was significant growth across domains making DNS and Web services available over IPv6, though fewer of those domains had IPv6-enabled mail servers. A few days after the mandate deadline, a blog post published by Cisco noted "As of today [October 3], 20% of US Federal Agencies WEB sites are fully IPv6 reachable (304 over 1493). While 20% may look a small percentage, the 304 IPv6 enabled websites are among the most visited federal agencies in the United States. Most of the US Federal Departments have at least one flagship site and the overall trend and momentum is very encouraging."[17] Many of these agency Web sites that were made available over IPv6 were done so using Akamai, as so-called Public Sector customers have been among the earliest adopters of Akamai's IPv6-enabled content delivery and acceleration services.

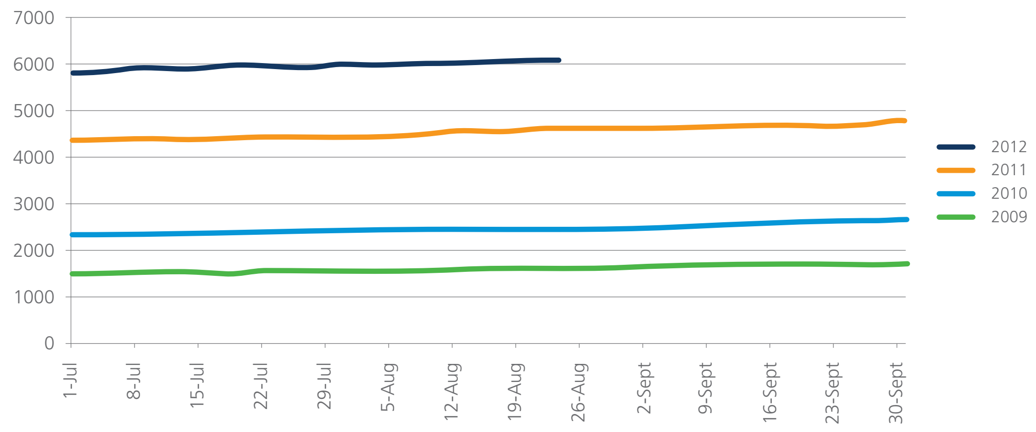


Figure 7: Total Number of Autonomous Systems in the IPv6 Routing Table

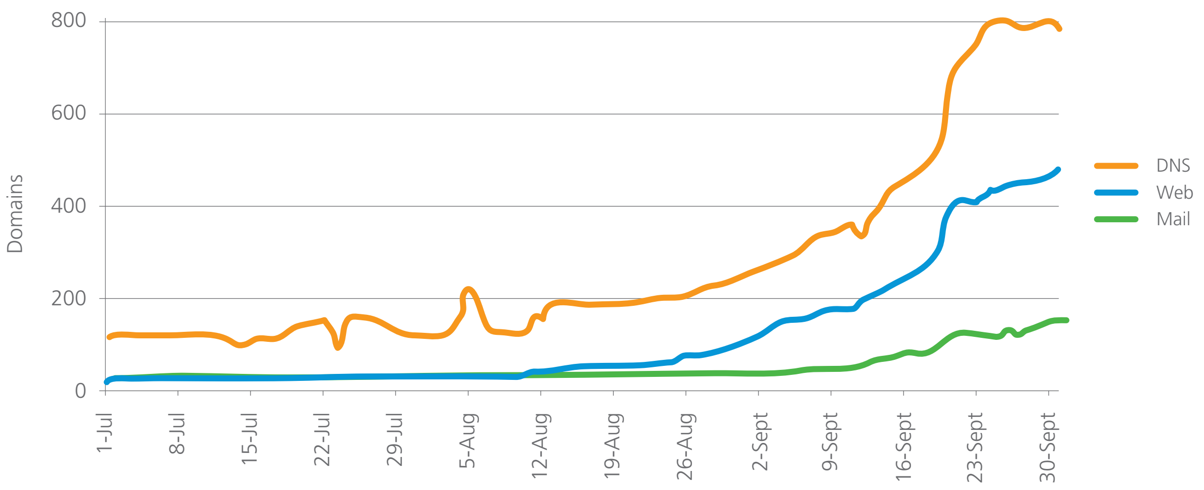


Figure 8: United States Government IPv6 Operational Service Domains Over Time[18]

DID YOU KNOW?

Global IPv6 traffic on the Akamai Intelligent Platform reached a peak of 92,891 hits/second in the third quarter. IPv6 traffic from the United States reached a peak of 48,488 hits/second.

Geography – Global

By virtue of the approximately two trillion requests for Web content that it services on a daily basis through its globally deployed Intelligent Platform, Akamai has a unique level of visibility into the speeds of end-user connections and, therefore, into broadband adoption around the globe. Because Akamai has implemented a distributed platform model, deploying servers within edge networks, it can deliver content more reliably and consistently than centralized providers that rely on fewer deployments in large data centers. For more information on why this is possible, please see Akamai's *How Will The Internet Scale?* white paper[19] or the video explanation at http://www.akamai.com/whytheedge.

The data presented within this section was collected during the third quarter of 2012 through Akamai's globally-deployed Intelligent Platform and includes all countries/regions that had more than 25,000 unique IP addresses make requests for content to Akamai during the quarter. For purposes of classification within this report, the "high broadband" data included below is for connections of 10 Mbps or greater, and "broadband" is for connections of 4 Mbps or greater. As noted in previous reports, these definitions have been updated to reflect an overall trend toward greater availability of higher speed connections. Similarly, as noted last quarter,the *State of the Internet Report* will no longer include "narrowband" (connections of 256 kbpsor less) data, nor will it include city-level data.

In addition to providing insight into high broadband and broadband adoption levels, the report also includes 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.

Finally, traffic from known mobile networks will be analyzed and reviewed in a separate section of the report; 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.

3.1 Global Average Connection Speeds

The global average connection speed saw an unexpected decline in the third quarter, dropping 6.8% to 2.8 Mbps. However, as shown in Figure 9, Japan was the only country among the top 10 to also see a lower average connection speed quarter-over-quarter, declining just over 2% to 10.5 Mbps. Across the other countries in the group, quarterly gains were relatively modest, ranging from just 0.1% in Latvia (to 8.7 Mbps) to 8.8% in the United States (to 7.2 Mbps). Globally, a total of 102 countries/

	Country/Region	Q3 '12 Avg. Mbps	QoQ Change	YoY Change
–	Global	2.8	-6.8%	11%
1	South Korea	14.7	3.3%	-12%
2	Japan	10.5	-2.1%	18%
3	Hong Kong	9.0	0.9%	-14%
4	Switzerland	8.7	3.1%	16%
5	Latvia	8.7	0.1%	-2.2%
6	Netherlands	8.5	7.2%	0.8%
7	Czech Republic	7.6	5.6%	4.7%
8	Denmark	7.2	8.6%	19%
9	United States	7.2	8.8%	20%
10	Finland	6.8	3.8%	21%

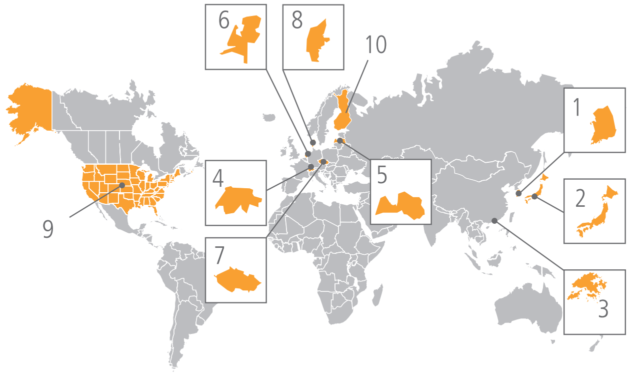


Figure 9: Average Measured Connection Speed by Country/Region

regions that qualified for inclusion saw average connection speeds increase quarter-over-quarter, ranging from the aforementioned 0.1% growth in Latvia to growth of 139% in Côte D'Ivoire (to 1.0 Mbps). Quarterly losses across qualifying countries/regions ranged from just 0.2% in Armenia (to 1.8 Mbps) to a 28% decline in Sudan (to 0.8 Mbps).

Looking at longer-term trends, the global average connection speed enjoyed healthy 11% growth year-over-year, with seven of the top 10 growing year-over-year as well. The smallest level of yearly growth was seen in the Netherlands, which added just 0.8% (to 8.5 Mbps), while Finland jumped 21% (to 6.8 Mbps). Among the decliners, Latvia lost just 2.2% year-over-year, while South Korea and Hong Kong both dropped more than 10% (to 14.7 Mbps and 9.0 Mbps respectively). Around the rest of the world, a total of 104 qualifying countries/regions saw a yearly increase in average connection speeds, from just 0.6% in Cyprus (to 2.7 Mbps) to 244% growth in Kenya (to 1.9 Mbps). Year-over-year declines were seen in just 33 qualifying countries/regions, with losses ranging from a tiny 0.2% in Malta (to 3.6 Mbps) to a 44% decline in Oman (to 1.0 Mbps)

In the third quarter, 19 qualifying countries had average connection speeds of 1 Mbps or less, down from 22 in the second quarter and 24 in the first quarter of 2012. Libya returned to its position as the country with the lowest average connection speed, at 0.5 Mbps.

3.2 Global Average Peak Connection Speeds

The average peak connection speed metric represents an average of the maximum measured connection speeds across all of the unique IP addresses seen by Akamai from a particular geography. The average is used to mitigate the impact of unrepresentative maximum measured connection speeds. In contrast to the average connection speed, the average peak connection speed is more representative of Internet connection capacity. (This includes the application of so-called speed boosting technologies that may be implemented within the network by providers in order to deliver faster download speeds for some larger files.)

Similar to the average connection speed metric, the global average peak connection speed also saw a minor quarter-over-quarter decline, dropping 1.4% to 15.9 Mbps. As shown in Figure 10, Romania was the only country among the top 10 to also see a quarterly decline, losing 3.2% (to 37.4 Mbps). Otherwise, among the balance of the top 10 countries/regions and the United States, quarter-over-quarter changes were fairly positive, ranging from 4.0% growth in South Korea (to 48.8 Mbps) to a very solid 18% increase in Israel (to 30.9 Mbps). The United States (at #14 globally) added 9.3% quarter-over-quarter, reaching an average peak connection speed of 29.6 Mbps in the third quarter. Globally, 120 countries/regions around the world that qualified for inclusion also saw quarterly increases in

	Country/Region	Q3 '12 Peak Mbps	QoQ Change	YoY Change
–	Global	15.9	-1.4%	36%
1	Hong Kong	54.1	9.9%	17%
2	South Korea	48.8	4.0%	4.1%
3	Japan	42.2	4.1%	28%
4	Latvia	37.5	12%	17%
5	Romania	37.4	-3.2%	8.4%
6	Belgium	32.7	11%	22%
7	Switzerland	32.4	8.4%	30%
8	Bulgaria	32.1	15%	36%
9	Israel	30.9	18%	39%
10	Singapore	30.7	8.4%	42%
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14	United States	29.6	9.3%	25%

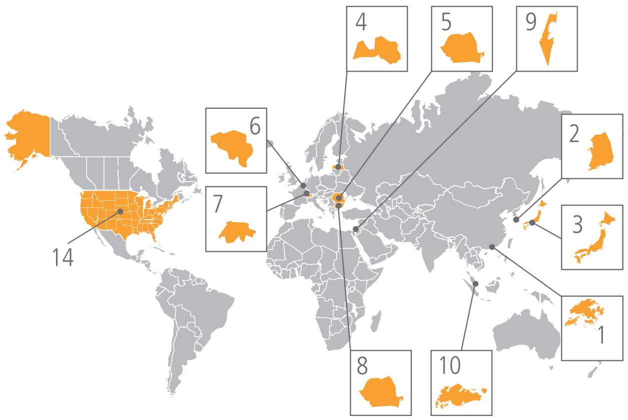

Figure 10: Average Peak Connection Speed by Country/Region

average peak connection speeds, ranging from Algeria's 0.3% growth (to 7.9 Mbps) to a doubling in Côte D'Ivoire (to 12.7 Mbps). Just 16 qualifying countries/regions saw quarter-over-quarter declines, with Sudan and Iran both seeing the most significant losses, each dropping 29% (to 5.8 Mbps and 2.9 Mbps respectively).

Looking at year-over-year changes, significant improvement was once again seen in the global average peak connection speed, which grew 36%. Yearly increases were seen across all of the top 10 countries, as well as in the United States, with growth of greater than 10% seen in all countries except for South Korea and Romania, though both of those countries had solid year-over-year increases as well, at 4.1% and 8.4% respectively. Singapore had the largest yearly change among the top 10, growing an impressive 42% (to 30.7 Mbps), while three other countries grew in excess of 30% from the third quarter of 2011. Globally, all but two (Vietnam and Egypt) of the qualifying countries/regions experienced yearly increases in average peak connection speeds, ranging from South Korea's aforementioned 4.1% growth to greater than 200% growth in Lebanon and Kenya, which increased 276% and 231% respectively to 12.6 and 7.7 Mbps.

3.3 Global High Broadband Connectivity

As was noted in the *1st Quarter, 2012 State of the Internet Report*, the term "high broadband" (as used within the report) was redefined to include connections to Akamai of 10 Mbps or greater.

After a slight decline in the second quarter, the global high broadband adoption rate grew by 8.8% in the third quarter, reaching 11%. As shown in Figure 11, quarterly increases were also seen in all of the top 10 countries, ranging from just 2.0% in Latvia (to 26% adoption) to a surprisingly large 41% jump in Sweden (to 16% adoption). On a global basis, 42 of 45 countries/regions that qualified for inclusion saw high broadband adoption rates grow on a quarterly basis, ranging from a meager 0.8% increase in Italy (to 2.7% adoption) to an extremely impressive 90% jump in South Africa (to 2.0%). Only Singapore, Romania, and Australia declined quarter-over-quarter, losing 3.2%, 11%, and 13% respectively. Overall, China remained the country with the lowest level of high broadband adoption, growing 27% to 0.2%.

Looking at year-over-year changes, the global high broadband adoption rate once again saw a very solid increase, growing 22% from the third quarter of 2011. Among the top 10 countries, six countries also grew high broadband adoption rates year-over-year, with growth as high as 73% seen in both the United States (to 18% adoption) and Finland (to 16% adoption). The lowest yearly increase among the top 10 was seen in the Netherlands, which added only 1.1% (to 22% adoption). Year-over-year declines were seen in South Korea (down 5.8% to 52% adoption), Hong Kong (down 13% to 27% adoption), and Latvia (down 3.0%). Globally, 32 qualifying countries saw high broadband adoption levels increase year-over year. Growth of more than 100% was seen in Poland (108%), Spain (111%), and the United Kingdom (145%), while a massive 467% increase was seen in South Africa. Yearly declines were seen in 13 qualifying countries/regions, ranging from a 0.5% decline in Slovakia (to 7.6% adoption) to a 30% in the United Arab Emirates (to 9.7% adoption).

	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
–	Global	11%	8.8%	22%
1	South Korea	52%	7.8%	-5.8%
2	Japan	38%	3.4%	25%
3	Hong Kong	27%	3.8%	-13%
4	Latvia	26%	2.0%	-3.0%
5	Switzerland	22%	4.0%	55%
6	Netherlands	22%	17%	1.1%
7	United States	18%	14%	73%
8	Denmark	17%	34%	64%
9	Sweden	16%	41%	61%
10	Finland	16%	15%	73%

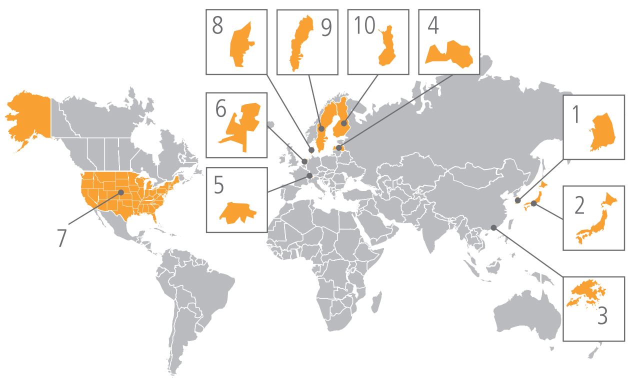

Figure 11: High Broadband (>10 Mbps) Connectivity

3.4 Global Broadband Connectivity

As was noted in the *1st Quarter, 2012 State of the Internet Report*, the term "broadband" (as used within the report) was redefined to include connections to Akamai of 4 Mbps or greater.

In the third quarter, the global broadband adoption rate increased 4.8%, growing to 41% as shown in Figure 12. Among the top 10 countries, nine also saw quarterly increases in broadband adoption, ranging from 2.2% growth in Switzerland (to 81% adoption), Japan (to 75% adoption), and Canada (to 70% adoption) to 7.0% growth in both Latvia (to 72% adoption) and the Czech Republic (to 68% adoption). In this group, only Belgium saw its broadband adoption rate decline quarter-over-quarter, dropping 1.3% (to 68% adoption). The United States (#12 globally) saw a solid 9.1% quarterly increase, growing to a broadband adoption level of 62%. Globally, 59 countries/regions that qualified for inclusion saw higher broadband adoption levels than in the second quarter, with Indonesia more than doubling, increasing 123% (to 1.8% adoption). Twelve countries saw broadband adoption rates decline quarter-over-quarter, with Vietnam's 61% loss (to 1.2% adoption) the largest. Fifty-nine countries/regions around the world had broadband adoption rates greater than 10%, while Vietnam and Saudi Arabia had the lowest levels of adoption among countries that qualified for inclusion, both at 1.2%

Looking at year-over-year changes, global broadband adoption increased 9.7%, while increases were also seen in eight of the top 10 countries and the United States. Among the countries that saw yearly growth, increases ranged from 2.1% in the Netherlands (to 82% adoption) to 20% in Japan (to 75% adoption). The declines seen in Hong Kong and Belgium were both minimal, at 1.7% and 2.4% respectively. Globally, 53 countries that qualified for inclusion saw broadband adoption levels increase year over year, with Kenya's epic 3229% increase (to 5.5% adoption) the largest seen, though Ecuador's 807% increase (to 12% adoption) was also significant. Four other countries more than doubled adoption year-over-year, while 33 additional countries grew by 10% or more. The Netherlands had the lowest level of yearly growth, as noted previously. Among countries that saw yearly declines in broadband adoption levels, losses ranged from 0.4% in Colombia and Singapore (to 9.6% and 42% adoption, respectively) to a 72% decline in Vietnam (which also saw a 47% drop in the second quarter).

In September, the UN Broadband Commission for Digital Development released its first global broadband report, which evaluated the rollout of broadband around the world, and provides country rankings across up to 177 economies on economic impact, penetration, national broadband policy, and connecting people and dwellings.[20] It also tracked progress towards four key advocacy targets[21] dealing with broadband policy and affordability, as well as Internet access and Internet user penetration.

	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
–	Global	41%	4.8%	9.7%
1	South Korea	86%	3.3%	2.6%
2	Netherlands	82%	3.7%	2.1%
3	Switzerland	81%	2.2%	16%
4	Japan	75%	2.2%	20%
5	Latvia	72%	7.0%	3.4%
6	Hong Kong	71%	4.0%	-1.7%
7	Canada	70%	2.2%	12%
8	Belgium	68%	-1.3%	-2.4%
9	Denmark	68%	3.5%	12%
10	Czech Republic	68%	7.0%	3.1%
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12	United States	62%	9.1%	13%

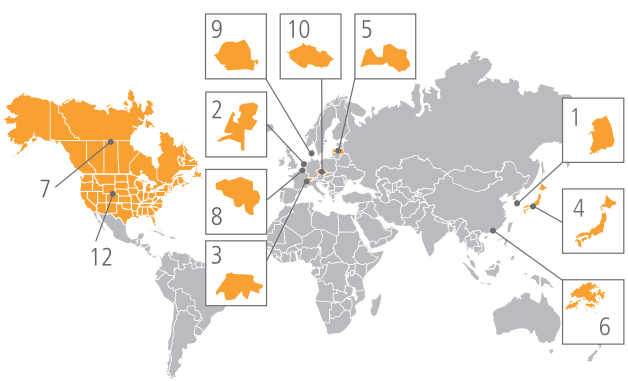

Figure 12: Broadband (>4 Mbps) Connectivity

The metrics presented here for the United States are based on a subset of data used for Section 3 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 United States, based on classification by Akamai's EdgeScape geolocation tool. As was noted in the introduction to Section 3, this section no longer includes city-level data nor data on narrowband (<256 kbps) connections, and the "new" definitions of high broadband (>10 Mbps) and broadband (>4 Mbps), put into place starting with the first quarter's report, are used here as well.

4.1 United States Average Connection Speeds

Despite its average connection speed declining nearly 10% quarter-over-quarter, Delaware remained the U.S. state with the highest average connection speed, at 10.9 Mbps. As shown in Figure 13, Delaware narrowly edged out the District of Columbia, whose 10.7 Mbps average connection speed was 11% higher than in the previous quarter. With the exception of Delaware, all of the other states in the top 10 saw quarterly increases in average connection speeds. Across the whole country, 43 states and the District of Columbia saw average connection speeds grow, ranging from a quarterly increase of 1.2% (to 8.4 Mbps) in Virginia, to an extremely strong increase of 62% in Missouri (to 5.9 Mbps). Only seven states saw average connection speeds decline quarter-over-quarter, and the losses were fairly nominal, ranging from 0.2% in Nevada (to 7.0 Mbps) to Delaware's aforementioned 9.7% loss. After ceding it to Missouri last quarter, Arkansas regained its spot as the state with the lowest average connection speed, at 3.7 Mbps.

Looking at year-over-year trends, all of the top 10 states saw average connection speeds increase, with strong growth seen across the states on the list — the smallest increase was once again seen in Rhode Island, at 7.2%, while the District of Columbia's 50% increase was the largest. Across the whole country, all 50 states and the District of Columbia saw increased average connection speeds as compared to the third quarter of 2011. Forty states saw double-digit percentage increases, while Kansas grew 132% year-over-year, to 5.5 Mbps.

Interestingly, the large jump in average connection speeds in Kansas comes ahead of the deployment of Google Fiber in multiple cities within the state, starting with Kansas City.[22] A post to Google's official blog in July[23] noted that the Google Fiber initiative will bring gigabit connectivity to users in Kansas City, and a November post to the Google Fiber blog[24] noted that Google was officially starting to connect homes to the service. As Google Fiber deployment grows, we will continue to monitor the average and average peak connection speeds in Kansas to see if there is any noticeable impact.

	State	Q3 '12 Avg. Mbps	QoQ Change	YoY Change
1	Delaware	10.9	-9.7%	27%
2	District Of Columbia	10.7	11%	50%
3	New Hampshire	10.4	2.8%	34%
4	Vermont	10.4	6.9%	25%
5	Rhode Island	9.1	1.6%	7.2%
6	Massachusetts	9.1	3.5%	22%
7	Connecticut	9.1	4.6%	23%
8	Utah	9.1	12%	14%
9	Washington	8.5	2.7%	23%
10	Virginia	8.4	1.2%	23%

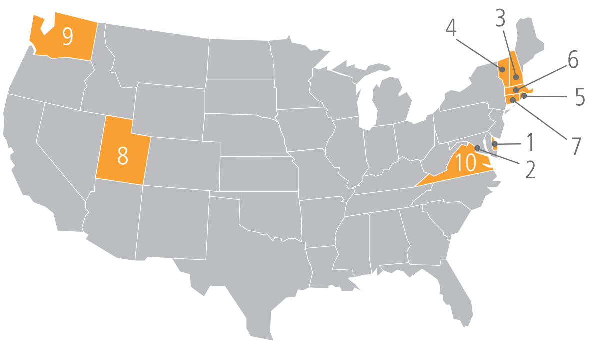

Figure 13: Average Measured Connection Speed by State

4.2 United States Average Peak Connection Speeds

The District of Columbia continued its trend of solid quarterly increases, growing its average peak connection speed by 13% to 43.3 Mbps, and pushed Delaware out of first place. As shown in Figure 14, Delaware was the only state among the top 10 to see a quarterly loss, dropping 5.7% to 39.3 Mbps, and moving down into second place. Among the remaining states on the list, Vermont, Massachusetts, Connecticut, and Utah all saw quarter-over-quarter changes greater than 10%. Across the whole country, 45 states and the District of Columbia all showed positive quarter-over-quarter changes, led by Missouri's 55% increase to 24.3 Mbps, while Kentucky's 0.7% increase (to 20.2 Mbps) was the smallest. Among the five states where average peak connection speeds declined on a quarterly basis, losses ranged from 0.5% in Washington (to 32.6 Mbps) to 5.7% in Delaware. Similar to the average connection speed metric, a slight quarterly loss in Arkansas dropped it back into the position as the state with the lowest average peak connection speed, at 17.3 Mbps.

Year-over-year changes among the top 10 states were all positive, and in general, fairly strong. Among this list, only Delaware and Rhode Island saw average peak connection speeds grow by less than 10% from the third quarter of 2011, while the District of Columbia's impressive 50% growth was the highest. However, across the whole country, both Kansas and Missouri bested it, growing 122% (to 20.6 Mbps) and 70% respectively. Additionally, solid year-over-year growth was seen across all states, with increases of 10% or more seen across all but four states — the smallest yearly change was seen in West Virginia, which grew 7.4% (to 25.4 Mbps).

	State	Q3 '12 Peak Mbps	QoQ Change	YoY Change
1	District Of Columbia	42.3	13%	50%
2	Delaware	39.3	-5.7%	9.0%
3	Vermont	38.8	11%	26%
4	New Hampshire	37.1	8.6%	37%
5	Massachusetts	36.0	11%	30%
6	Virginia	35.4	3.8%	24%
7	Connecticut	34.7	11%	31%
8	Rhode Island	34.6	3.0%	7.6%
9	New York	34.0	8.4%	23%
10	Utah	33.1	13%	25%

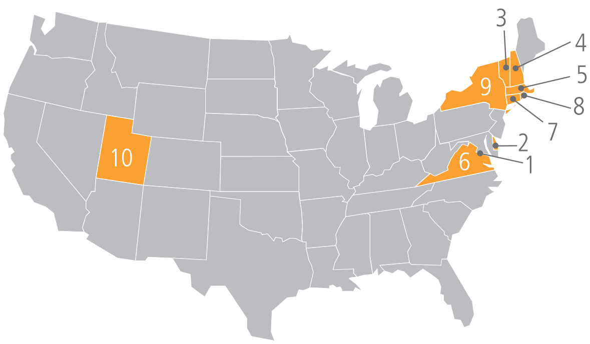

Figure 14: Average Peak Connection Speed by State

DID YOU KNOW?

- In the third quarter, twenty states and the District of Columbia had average peak connection speeds of 30 Mbps or higher.
- Arkansas was the only state with an average peak connection speed below 20 Mbps in the third quarter.
- The overall average peak connection speed in the United States has increased by more than 200% since Q3 2007.

4.3 United States High Broadband Connectivity

As was noted in the *1st Quarter, 2012 State of the Internet Report*, the term "high broadband" (as used within the report) was redefined to include connections to Akamai of 10 Mbps or greater.

As shown in Figure 15, quarter-over-quarter changes among the top 10 states were generally positive in the third quarter, with Delaware the only outlier, losing 17%, causing its high broadband adoption rate to fall to 32%. However, New Hampshire and Vermont both led the top 10 with 35% high broadband adoption rates. Quarterly growth rates among the top 10 were moderate in the third quarter, ranging from just 2.2% in Pennsylvania (to 23% adoption) to 13% in New York (to 24% adoption). Across the whole country, more than half the states saw high broadband adoption rates increase more than 10%, while almost 20 more also saw higher high broadband adoption rates. Just six states overall saw rates decline quarter-over-quarter, with losses ranging from just 0.3% in Virginia (to 22% adoption) to Delaware's 17% decline. Arkansas was once again the state with the lowest level of high broadband adoption.

The levels of year-over-year change in high broadband adoption rates across the top 10 states were once again extremely significant, with levels more than doubling in three states and the District of Columbia. Four more states saw yearly growth above 90%, with Delaware and Rhode Island trailing the pack, growing 77% and 44% year-over-year respectively. Across the remainder of the country, all other states also saw yearly growth in high broadband adoption, with the lowest growth seen in Nebraska, which increased a still respectable 7.1% to 9.6% adoption. Overall, a total of 11 states and the District of Columbia grew high broadband adoption levels 100% or more as compared to the third quarter of 2011, while an additional 28 states were up by 50% or more year-over-year.

4.4 United States Broadband Connectivity

As was noted previously, starting with the *1st Quarter, 2012 State of the Internet Report*, the term "broadband", as used within the report, has been redefined to include connections to Akamai of 4 Mbps or greater.

Despite a quarterly gain of less than 1%, New Hampshire was able to move past Delaware to become the state with the highest level of broadband adoption in the third quarter, as shown in Figure 16. Echoing its decline seen across the other metrics in this section, Delaware's drop of just under 10% moved the state into the second place position, with a broadband adoption rate of 85%. It was also the only state among the top 10 to see a quarterly decline in broadband adoption, though the gains across the other states in the list were fairly nominal, ranging from 0.3% in Washington (to 69% adoption) to 5.6% in New York (to 73% adoption). However, quarterly changes across the rest of the country were, to some extent, more significant, with nine states adding 10% or more, led by

	State	% Above 10 Mbps	QoQ Change	YoY Change
1	New Hampshire	35%	6.4%	92%
2	Vermont	35%	10%	95%
3	District Of Columbia	34%	7.8%	137%
4	Delaware	32%	-17%	77%
5	Massachusetts	31%	7.6%	92%
6	Rhode Island	31%	7.0%	44%
7	Connecticut	26%	12%	100%
8	New Jersey	25%	12%	142%
9	New York	24%	13%	95%
10	Pennsylvania	23%	2.2%	149%

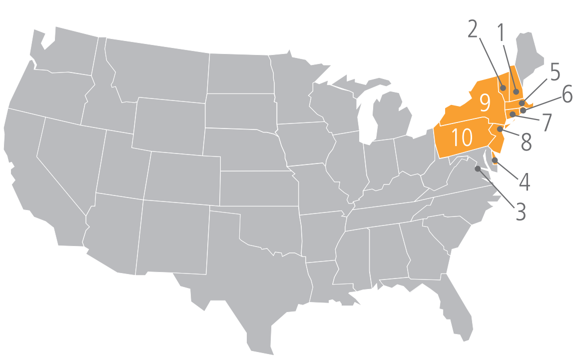

Figure 15: High Broadband (>10 Mbps) Connectivity, U.S. States

Missouri's 75% quarter-over-quarter increase (to 58% adoption). Four states, including Washington, saw quarterly increases of less than 1%, while Mississippi was unchanged. Five states saw quarterly declines in broadband adoption levels, ranging from a 0.6% loss in Nevada (to 63% adoption) to a 13% decline in Arkansas (to 26% adoption). Arkansas' 26% broadband adoption level placed it as the state with the lowest level of broadband adoption in the third quarter.

Looking at year-over-year changes among the top 10 states, two states and the District of Columbia saw growth in excess of 10%, while four others saw growth of more than 9%. Rhode Island's 1.2% year-over-year increase was the smallest among the states on the list, while Delaware was the only state in the top 10 to see a decline, losing 6.5% from the second quarter. Across the whole country, 48 states and the District of Columbia all saw broadband adoption levels increase year-over-year, led by a 224% increase in Kansas. New Jersey's 0.4% increase was the smallest seen across the country, while Maryland joined Delaware as the only other state to see a yearly loss, declining 6.2% (to 61% adoption).

DID YOU KNOW?

In July, the New America Foundation published a report entitled "The Cost of Connectivity" whose results indicate that U.S. consumers in major cities tend to pay higher prices for slower speeds compared to consumers abroad. The report suggests that policymakers need to re-evaluate current policy approaches to increase competition and encourage more affordable high-speed Internet service in the U.S.

[Source: http://oti.newamerica.net/publications/policy/the_cost_of_connectivity]

	State	% Above 4 Mbps	QoQ Change	YoY Change
1	New Hampshire	87%	0.6%	6.1%
2	Delaware	85%	-9.9%	-6.5%
3	Vermont	83%	0.8%	9.4%
4	Rhode Island	83%	0.8%	1.2%
5	Connecticut	76%	3.7%	15%
6	New York	73%	5.6%	9.3%
7	Massachusetts	72%	1.3%	9.7%
8	District Of Columbia	71%	2.0%	13%
9	South Carolina	70%	2.4%	14%
10	Washington	69%	0.3%	9.7%

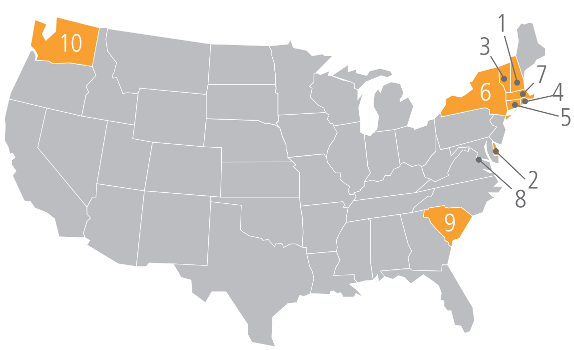

Figure 16: Broadband (>4 Mbps) Connectivity, U.S. States

Geography – Asia Pacific Region

The metrics presented here for the Asia Pacific region are based on a subset of data used for Section 3 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.) As was noted in the introduction to Section 3, this section will no longer include city-level data, nor data on narrowband (<256 kbps), and the "new" definitions of high broadband (>10 Mbps) and broadband (>4 Mbps) are used here as well.

5.1 Asia Pacific Average Connection Speeds

In the third quarter of 2012, the top three countries/regions in the Asia Pacific region (and the world, for that matter) with the highest average connection speeds remained South Korea, Japan, and Hong Kong, as shown in Figure 17. Of the three, South Korea and Hong Kong saw nominal levels of quarter-over-quarter growth, growing 3.3% (to 14.7 Mbps) and 0.9% (to 9.0 Mbps) respectively, while Japan declined slightly, losing 2.1% (to 10.5 Mbps). Singapore, Australia, Thailand, and Vietnam joined Japan in seeing average connection speeds drop, with Vietnam's 21% loss (to 1.3 Mbps) the most significant among surveyed countries the region. Among those countries that saw positive quarter-over-quarter changes, growth ranged from Hong Kong's 0.9% increase to a 54% jump in Indonesia (to 1.2 Mbps). India remained just slightly above the 1.0 Mbps mark, with a 2.5% quarter-over-quarter increase, and China continued to grow as well, adding 11% from the second quarter, to 1.6 Mbps.

Year-over-year changes were more mixed, with nine of the surveyed countries/regions seeing higher average connection speeds as compared to the third quarter of 2011, and five seeing lower speeds. Among the gainers, growth ranged from a still respectable 7.1% in Taiwan (to 4.4 Mbps) to a surprisingly large 58% increase in Indonesia. All of the countries/regions that saw yearly increases, except for Taiwan, grew in excess of 10%. Among the countries/regions that saw average connection speeds decline year-over-year, losses ranged from just 1.7% in New Zealand (to 3.9 Mbps) to 19% in Vietnam. All of the countries that saw yearly declines, except for New Zealand, lost in excess of 10%.

Global Rank	Country/Region	Q3 '12 Avg. Mbps	QoQ Change	YoY Change
1	South Korea	14.7	3.3%	-12%
2	Japan	10.5	-2.1%	18%
3	Hong Kong	9.0	0.9%	-14%
32	Singapore	4.9	-3.5%	12%
39	Taiwan, Province of China	4.4	16%	7.1%
40	Australia	4.3	-2.5%	19%
46	New Zealand	3.9	1.8%	-1.7%
58	Thailand	2.9	-6.3%	-14%
71	Malaysia	2.2	2.0%	18%
94	China	1.6	11%	18%
112	Philippines	1.3	6.0%	13%
113	Vietnam	1.3	-21%	-19%
115	Indonesia	1.2	54%	58%
120	India	1.0	2.5%	11%

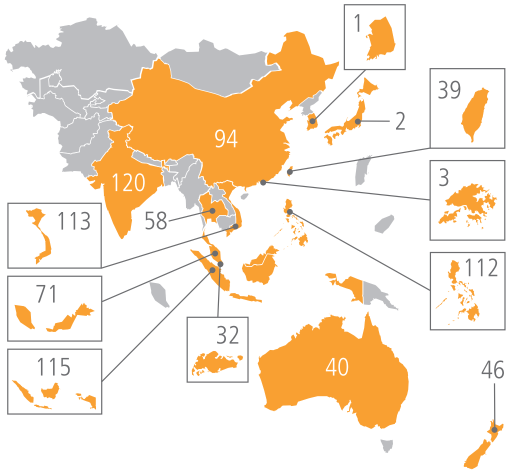

Figure 17: Average Connection Speed by Asia Pacific Country/Region

5.2 Asia Pacific Average Peak Connection Speeds

As shown in Figure 18, Hong Kong once again remained the Asia Pacific country/region with the highest average peak connection speed, vaulting back past the 50 Mbps threshold, and growing 9.9% to 54.1 Mbps. This put it well ahead of South Korea, which grew 4.0% (to 48.8 Mbps) and Japan, which grew 4.1% (to 42.2 Mbps). Among the surveyed Asia Pacific countries/regions, only Vietnam saw its average peak connection speed decline quarter-over-quarter, losing 3.0% (to 8.6 Mbps). Growth levels varied across the other surveyed countries/regions, ranging from South Korea's 4.0% increase to a massive 65% jump in Indonesia (to 13.8 Mbps). Indonesia, Taiwan, Malaysia, and China all saw double-digit percentage changes quarter-over-quarter, though even with a 21% increase, China's average peak connection speed of 7.1 Mbps was still the lowest of the group. India and Vietnam joined China as the only three countries in the Asia Pacific region to have average peak connection speeds under 10 Mbps.

In looking at year-over-year changes in average peak connection speeds, strong changes were seen across most of the surveyed countries/regions. Only Vietnam declined year-over-year, though the 0.1% loss is hardly meaningful, while South Korea and New Zealand were the only two countries that grew less that 10%, increasing 4.1% and 6.6% (to 17.8 Mbps), respectively. Among the other countries/regions, Indonesia's 144% yearly increase was far and away the largest one, though five others (Singapore, Australia, Malaysia, the Philippines, and India) all grew more than 30%. China, Japan, and Taiwan were not too far behind, increasing average peak connection speeds by 29%, 28%, and 27% respectively.

Global Rank	Country/Region	Q3 '12 Peak Mbps	QoQ Change	YoY Change
1	Hong Kong	54.1	9.9%	17%
2	South Korea	48.8	4.0%	4.1%
3	Japan	42.2	4.1%	28%
10	Singapore	30.7	8.4%	42%
15	Taiwan, Province of China	28.5	16%	27%
34	Australia	22.8	5.3%	41%
41	Thailand	20.2	5.6%	12%
51	Malaysia	18.2	11%	42%
52	New Zealand	17.8	7.8%	6.6%
69	Indonesia	13.8	65%	144%
90	Philippines	11.9	9.6%	43%
110	Vietnam	8.6	-3.0%	-0.1%
115	India	8.0	9.3%	39%
123	China	7.1	21%	29%

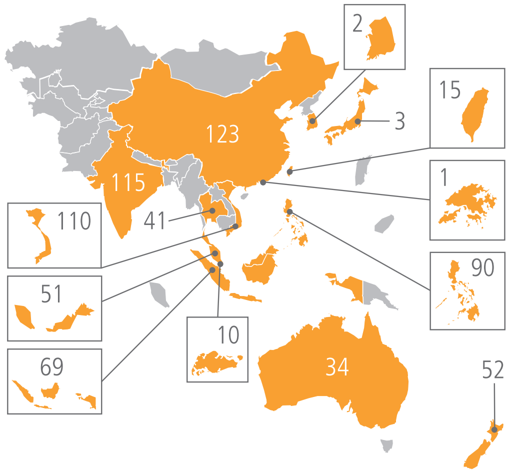

Figure 18: Average Peak Connection Speed by Asia Pacific Country/Region

DID YOU KNOW?

- Hong Kong's 54.1 Mbps average peak connection speed in the third quarter marks the first time that an average peak connection speed has exceeded 50 Mbps.
- The average peak connection speed in India has increased nearly 140% since Q3 2007, while China's has increased nearly 250% over the same period.

5.3 Asia Pacific High Broadband Connectivity

As was noted previously, starting with the 1st *Quarter, 2012 State of the Internet Report*, the term "high broadband", as used within the report, has been redefined to include connections to Akamai of 10 Mbps. As was highlighted in previous 2012 editions of the report, with the redefinition of "high broadband," a number of surveyed Asia Pacific countries/regions no longer qualify to be included as part of the global ranking, as they had fewer than 25,000 unique IP addresses connecting to Akamai at speeds above 10 Mbps. However, the high broadband adoption rates for those countries are still listed in Figure 19 for the sake of completeness.

A large gap in high broadband adoption remained among the surveyed countries/regions in the Asia Pacific region that qualified for inclusion, with adoption levels ranging from 52% in South Korea (highest in the region and globally) to just 0.2% in China. Quarterly growth among these countries had a fairly broad range as well, from just 1.4% in New Zealand (to 2.4% adoption) to 43% in Taiwan (to 4.7% adoption). Singapore and Australia were the only two qualifying countries to see quarterly losses, with Singapore declining 3.2% (to 6.9% adoption) and Australia declining 13% (to 4.1% adoption). Among the countries that did not qualify for inclusion, they all had high broadband adoption levels below 1%. Significant quarterly losses were seen in Malaysia, Thailand, and Vietnam, with the latter dropping below 0.1% adoption.

Year-over-year changes among the qualifying countries/regions were split in the third quarter, with five seeing increases, and three seeing decreases. China saw the largest growth, increasing 70%, while Taiwan was close behind with a 62% increase (to 4.7% adoption). Japan, Singapore, and Australia also saw solid increases, all above 10%. Among the three qualifying countries that lost ground year-over-year, South Korea declined 5.8%, while Hong Kong and New Zealand declined 13% (to 27% adoption) and 16% (to 2.4% adoption) respectively. Among the countries that did not qualify for inclusion in the global rankings, India surprisingly remained unchanged year-over-year, while significant declines were seen in Vietnam and Thailand. Conversely, solid yearly increases were seen in Malaysia and the Philippines.

5.4 Asia Pacific Broadband Connectivity

As was noted previously, starting with the 1st *Quarter, 2012 State of the Internet Report*, the term "broadband", as used within the report, has been redefined to include connections to Akamai of 4 Mbps or greater.

As Figure 20 shows, there remains an extremely wide variation in broadband adoption rates among Asia Pacific countries/regions, ranging from 86% in perennial leader South Korea, up 3.3% from last quarter, to just 1.2% in Vietnam, down 61% from last quarter. In addition to Vietnam, Singapore, Australia, Thailand, and Malaysia also saw broadband adoption levels decline quarter-over-quarter, with Singapore's 11% loss (to 42% adoption) the

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
1	South Korea	52%	7.8%	-5.8%
2	Japan	38%	3.4%	25%
3	Hong Kong	27%	3.8%	-13%
29	Singapore	6.9%	-3.2%	28%
34	Taiwan, Province of China	4.7%	43%	62%
36	Australia	4.1%	-13%	14%
38	New Zealand	2.4%	1.4%	-16%
44	China	0.2%	27%	70%
–	Malaysia	0.9%	-28%	27%
–	Thailand	0.6%	-41%	-56%
–	Indonesia	0.2%	74%	-1.1%
–	Philippines	0.2%	4.1%	66%
–	India	0.1%	-1.4%	–
–	Vietnam	0.0%	-49%	-69%

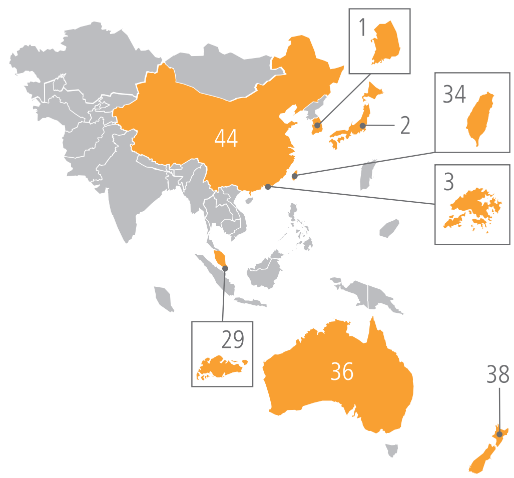

Figure 19: High Broadband (>10 Mbps) Connectivity, Asia Pacific Countries/Region

worst of the group. Among the countries/regions that experienced quarterly growth in broadband adoption levels, Indonesia's 123% increase (to 1.8% adoption) was by far the largest, while New Zealand's 1.6% increase (to 35% adoption) was the smallest. The Philippines, which did not qualify for inclusion in this metric, gained just 1.9% quarter-over-quarter, keeping the broadband adoption rate at 1.3%.

Year-over-year changes were also mixed among Asia Pacific countries/regions. Among countries/regions that saw broadband adoption rates increase, there was a wide range of growth, from just 2.6% in South Korea to 79% in China (to 3.9% adoption). In addition to China, Malaysia, Indonesia, and India also grew by 40% or more year-over-year. Across the seven countries/regions that saw broadband adoption rates decrease year-over-year, losses ranged from a meager 0.4% in Singapore to 41% in Thailand (to 17% adoption) and 72% in Vietnam. The Philippines also saw broadband adoption decline year-over-year, down 4.5%

A July presentation to the Pacific Broadband Forum[25] highlighted a number of initiatives from the International Telecommunications Union (ITU) designed to increase broadband access and adoption within the Asia Pacific region. The ITU presentation noted that at least 110 governments have already adopted a national policy, strategy or plan to promote broadband, and that one-fifth of ITU Member States (over 40 countries) have included broadband as part of universal access.

DID YOU KNOW?

- India's broadband adoption level has only been above 1% since Q3 2011.
- According to research undertaken by the New America Foundation for their "The Cost of Connectivity" report, for the equivalent of $25-40 USD per month:
  - Users in Hong Kong have access to 500 Mbps Internet connectivity ($37.34 USD)
  - Users in Tokyo have access to 200 Mbps Internet connectivity ($26.85 USD)
  - Users in Seoul have access to 100 Mbps Internet connectivity ($31.90 USD)

[Source: http://newamerica.net/publications/policy/the_cost_of_connectivity#4]

Global Rank	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
1	South Korea	86%	3.3%	2.6%
4	Japan	75%	2.2%	20%
6	Hong Kong	71%	4.0%	-1.7%
35	Singapore	42%	-11%	-0.4%
37	Taiwan, Province of China	38%	20%	-5.4%
38	Australia	38%	-0.4%	35%
42	New Zealand	35%	1.6%	-7.1%
49	Thailand	17%	-2.1%	-41%
56	Malaysia	12%	-0.4%	44%
68	China	3.9%	27%	79%
69	Indonesia	1.8%	123%	41%
70	India	1.5%	6.9%	40%
71	Vietnam	1.2%	-61%	-72%
–	Philippines	1.3%	1.9%	-4.5%

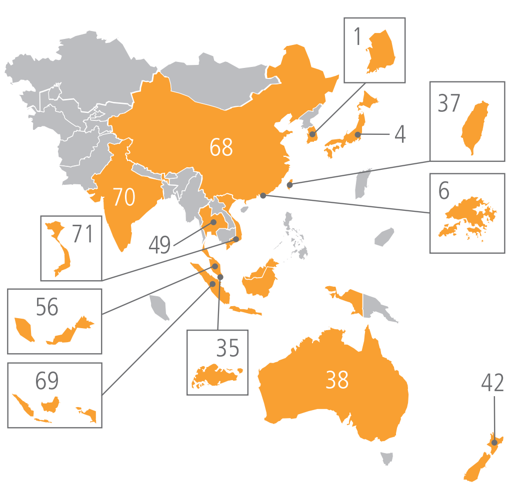

Figure 20: Broadband (>4 Mbps) Connectivity, Asia Pacific Countries/Region

Geography – Europe/Middle East/Africa (EMEA)

The metrics presented here for the Europe/Middle East/Africa (EMEA) region are based on a subset of data used for Section 3 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 EMEA region, based on classification by Akamai's EdgeScape geolocation tool. As was noted in the introduction to Section 3, this section no longer includes city-level data nor data on narrowband (<256 kbps) connections, and the "new" definitions of high broadband (>10 Mbps) and broadband (>4 Mbps), put into place starting with the first quarter's report, are used here as well.

6.1 EMEA Average Connection Speeds

After moving up to the top spot in the second quarter, Switzerland remained the EMEA country with the fastest average connection speed, increasing 3.1% quarter-over-quarter to 8.7 Mbps. The Netherlands was close behind, growing its average connection speed 7.2% on a quarterly basis to 8.5 Mbps. As shown in Figure 21, quarterly growth was generally the norm across the EMEA region, with just Romania and Italy seeing minor quarterly declines, losing 2.5% (to 6.4 Mbps) and 2.6% (to 3.9 Mbps) respectively. Across the surveyed countries, Sweden, the United Kingdom, Norway, Israel, and South Africa all grew by more than 10% quarter-over-quarter, led by South Africa's 18% increase to 2.1 Mbps. The smallest quarterly growth was seen in Belgium, which increased 1.9% from the second quarter to 6.7 Mbps. In spite of its 18% quarterly increase, as noted above, South Africa remained the country in the EMEA region with the lowest average connection speed, though it is slowly closing the gap with Turkey—last quarter, approximately 900 kbps separated the two countries, while they are separated by approximately 700 kbps in the third quarter.

Year-over-year changes in the third quarter were unexpectedly more mixed than quarter-over-quarter changes, with seven countries in the EMEA region seeing declines, as compared to just the two that saw quarterly losses. Similar to the quarterly losses, the year-over-year declines were also fairly nominal, ranging from 2.2% in Italy to 7.6% in the United Arab Emirates (to 5.7 Mbps). Among the balance of the EMEA countries that saw year-over-year increases, growth ranged from just 0.8% in the Netherlands to 32% in South Africa. Fourteen of the 18 countries that saw year-over-year growth, including South Africa, increased more than 10%, pointing to strong ongoing improvements within the region.

Global Rank	Country/Region	Q3 '12 Avg. Mbps	QoQ Change	YoY Change
4	Switzerland	8.7	3.1%	16%
6	Netherlands	8.5	7.2%	0.8%
7	Czech Republic	7.6	5.6%	4.7%
8	Denmark	7.2	8.6%	19%
10	Finland	6.8	3.8%	21%
11	Sweden	6.8	16%	25%
13	Ireland	6.7	7.6%	-4.8%
14	Belgium	6.7	1.9%	7.2%
15	Austria	6.5	3.6%	21%
16	Romania	6.4	-2.5%	-3.6%
17	United Kingdom	6.3	11%	24%
18	Norway	6.2	13%	16%
19	Germany	5.9	2.3%	12%
21	Slovakia	5.8	6.8%	5.6%
22	Hungary	5.8	2.7%	-2.5%
23	United Arab Emirates	5.7	8.3%	-7.6%
24	Israel	5.6	13%	18%
25	Poland	5.3	7.7%	24%
29	Russia	5.1	5.5%	19%
34	Portugal	4.8	2.8%	-5.4%
35	Spain	4.8	4.2%	20%
36	France	4.8	3.5%	25%
45	Italy	3.9	-2.6%	-2.2%
60	Turkey	2.8	4.4%	-3.3%
72	South Africa	2.1	18%	32%

Figure 21: Average Measured Connection Speed by EMEA Country/Region

6.2 EMEA Average Peak Connection Speeds

As shown in Figure 22, Romania continued to hold the top spot in the EMEA region for average peak connection speed, despite a slight quarterly decline to 37.4 Mbps. Romania was the only EMEA country to see a quarterly decline, with increases among the other countries in the regions generally rather strong. Fifteen countries had average peak connection speeds grow by 10% or more quarter-over-quarter, led by South Africa's 23% increase (to 6.8 Mbps). Among the countries that grew by less than 10%, the Czech Republic's 5.5% increase (to 27.3 Mbps) was the lowest, though that is still a very solid growth rate. In spite of its extremely strong quarterly increase, South Africa remained the country with the lowest average peak connection speed in the EMEA region, over 12 Mbps behind Italy, which had the next lowest speed (19.2 Mbps). (We continue to exclude the United Arab Emirates from the list in Figure 22 due to anomalies in the data that we believe are due to the network architecture within the country.)

In the third quarter, year-over-year changes in the EMEA region remained positive, with all surveyed countries seeing yearly increases in average peak connection speed, and strong ones at that. Though it had the highest average peak connection speed in the region, Romania had the lowest level of year-over-year growth (8.4%), making it the only country to increase less than 10%. Among the remaining countries in the region, the United Kingdom, Poland, and Russia all grew by 40% or more, while six more countries grew in excess of 30% and 11 additional countries added 20% or more year-over-year. The remaining three countries (Ireland, Italy, and South Africa) grew by more than 10%.

6.3 EMEA High Broadband Connectivity

With a strong 17% quarter-over-quarter change, the Netherlands joined Switzerland in having the highest levels of high broadband adoption among surveyed countries in the EMEA region in the third quarter. As shown in Figure 23, 22% of the connections to Akamai from both countries were at speeds of 10 Mbps or more. Similar to the average peak connection speed metric, positive quarter-over-quarter changes were also seen in all of the other surveyed EMEA countries with the exception of Romania, which declined 11% (to 11% adoption). Quarterly growth in EMEA countries ranged from 0.8% in Italy (to 2.7% adoption) to a massive 90% increase in South Africa (to 2.0% adoption). Extremely strong growth was also seen in a number of other

Global Rank	Country/Region	Q3 '12 Peak Mbps	QoQ Change	YoY Change
5	Romania	37.4	-3.2%	8.4%
6	Belgium	32.7	11%	22%
7	Switzerland	32.4	8.4%	30%
9	Israel	30.9	18%	39%
11	Netherlands	30.7	9.8%	20%
12	Hungary	30.0	7.0%	22%
13	Portugal	29.8	7.1%	20%
16	United Kingdom	28.1	15%	41%
17	Czech Republic	27.3	5.5%	23%
19	Sweden	26.9	14%	28%
20	Denmark	26.5	16%	36%
21	Ireland	26.4	18%	13%
22	Slovakia	26.2	12%	30%
23	Germany	26.0	8.3%	27%
24	Spain	26.0	9.4%	38%
25	Poland	25.1	10%	49%
26	Finland	25.0	11%	26%
27	Austria	24.7	10%	35%
31	Russia	23.9	13%	40%
33	Norway	23.2	18%	24%
43	France	19.6	7.3%	24%
44	Turkey	19.6	13%	22%
46	Italy	19.2	10%	19%
124	South Africa	6.8	23%	18%

Figure 22: Average Peak Connection Speed by EMEA Country/Region

DID YOU KNOW?

According to research undertaken by the New America Foundation for their "The Cost of Connectivity" report, for the equivalent of $25-35 USD per month:

- Users in Paris have access to 100 Mbps Internet connectivity ($34.37 USD)
- Users in Berlin have access to 100 Mbps Internet connectivity ($24.57 USD)
- Users in London have access to 60 Mbps Internet connectivity ($28.03 USD)

[Source: http://newamerica.net/publications/policy/the_cost_of_connectivity#4]

countries within the region, as Sweden and the United Kingdom both grew by more than 40% on a quarterly basis, while Denmark, Norway, and Ireland all grew by more than 30%, with the United Arab Emirates, Poland, and Turkey all showing growth of 20% or greater. Unfortunately, even with a 20% quarter-over-quarter increase, Turkey continues to have the lowest level of high broadband adoption among survey countries in the EMEA region, with just 0.6% of connections to Akamai at speeds above 10 Mbps.

Looking at year-over-year changes, growth was seen across a majority of countries in the EMEA region, with three times as many countries seeing higher adoption levels over the last year as those seeing adoption levels decline. Year-over-year growth ranged from just over one percent in the Netherlands, to adoption levels more than doubling in the United Kingdom (up 145% to 11% adoption), Poland (up 108% to 9.3% adoption), and Spain (up 111% to 5.0% adoption). An additional twelve countries saw double-digit percentage increases in high broadband adoption levels as compared to the third quarter of 2011. Among the six EMEA countries where high broadband adoption levels declined on a yearly basis, losses ranged from just half a percent in Slovakia (to 7.6% adoption) to 30% in the United Arab Emirates (to 9.7% adoption). Within the EMEA region, 12 of 25 surveyed countries had high broadband adoption levels above 10%, while the remaining thirteen were below 10%.

6.4 EMEA Broadband Connectivity

As shown in Figure 24, broadband adoption levels generally remained strong across most countries in the EMEA region in the third quarter. With a 3.7% quarterly increase, the Netherlands pushed just past Switzerland to have the highest broadband adoption level in the region, at 82%. With an 81% broadband adoption rate, Switzerland (along with the Netherlands) remained well ahead of Belgium, Denmark, and the Czech Republic, all of which saw 68% of connections to Akamai at speeds above 4 Mbps in the third quarter. Across the region, quarter-over-quarter growth ranged from 2.2% in Switzerland to 27% in South Africa (to 8.8% adoption). Only two countries saw broadband adoption levels decline quarter-over-quarter, with Belgium losing 1.3% and Italy losing 8.9% (to 25% adoption). Turkey's broadband adoption rate remained unchanged from the second quarter, and at 8.0%, it was the lowest in the EMEA region. Turkey and South Africa also remained the only two countries in the region with broadband adoption rates under 10%.

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
5	Switzerland	22%	4.0%	55%
6	Netherlands	22%	17%	1.1%
8	Denmark	17%	34%	64%
9	Sweden	16%	41%	61%
10	Finland	16%	15%	73%
11	Belgium	16%	12%	57%
12	Czech Republic	15%	3.7%	24%
13	Norway	15%	31%	60%
14	Austria	12%	11%	36%
16	Romania	11%	-11%	-11%
17	Ireland	11%	34%	8.7%
18	United Kingdom	11%	43%	145%
20	United Arab Emirates	9.7%	28%	-30%
21	Poland	9.3%	28%	108%
22	Hungary	8.4%	7.2%	-14%
23	Germany	8.4%	1.3%	42%
26	Russia	7.7%	13%	24%
27	Slovakia	7.6%	6.4%	-0.5%
28	Israel	7.0%	17%	81%
32	Spain	5.0%	11%	111%
33	Portugal	4.8%	9.6%	-15%
35	France	4.1%	6.9%	79%
37	Italy	2.7%	0.8%	7.5%
39	South Africa	2.0%	90%	467%
41	Turkey	0.6%	20%	-16%

Figure 23: High Broadband (>10 Mbps) Connectivity, EMEA Country/Region

DID YOU KNOW?

The high broadband adoption rate in Switzerland has grown over 680% since Q3 2007, while it has increased over 500% in the Netherlands across the same period.

Year-over-year changes were generally positive, with increases seen in 20 EMEA countries, and declines seen in just five. Strong growth was seen across many countries, with increases above 10% seen in 14 of them, led by the 79% increase in South Africa and the 70% increase in France (to 47% adoption). In addition to South Africa and France, 12 other countries recorded double-digit year-over-year percentage increases in broadband adoption. The lowest level of yearly growth was seen in the Netherlands, at just 2.1%. Among the countries where broadband adoption levels decreased year-over-year, Turkey's 25% loss was the most significant, while losses among the other countries ranged from 2.4% in Belgium to 10% in Portugal.

In July, EU Commissioner for the Digital Agenda Neelie Kroes said that she intended to "set clear and lasting rules that will ensure financial returns on broadband infrastructure investment and so encourage the bloc's telecommunications companies to build high-speed fiber networks."[26] According to a Wall Street Journal article[27] on the topic, a trade association representing incumbent operators in the region noted that it fully supported the commission's views on pricing, as encompassed by the proposed rules. However, a trade association representing more than 100 newer operators in the region appeared to have an opposite stance, noting that they believed the new measures would represent "a blow to genuine competition." The article calls out the European Commission goal of having broadband connections of 30 Mbps available to all 500 million EU residents by 2020. In order to incent operators to deploy infrastructure towards that end, the European Commission has also made available €7 billion for broadband networks, earmarked particularly for areas less attractive to the market, such as isolated and rural regions.

Global Rank	Country/Region	% Above 4 Mbps	QoQ Change	YoY Change
2	Netherlands	82%	3.7%	2.1%
3	Switzerland	81%	2.2%	16%
8	Belgium	68%	-1.3%	-2.4%
9	Denmark	68%	3.5%	12%
10	Czech Republic	68%	7.0%	3.1%
11	Romania	64%	2.3%	2.5%
13	Hungary	62%	8.2%	5.4%
14	United Kingdom	62%	10%	26%
15	Germany	60%	5.2%	17%
16	Finland	59%	6.7%	26%
18	Austria	58%	2.8%	33%
19	Israel	56%	22%	61%
20	United Arab Emirates	56%	8.8%	-5.4%
22	Portugal	53%	4.5%	-10%
23	Russia	52%	7.8%	33%
25	Ireland	50%	4.6%	5.1%
26	Sweden	50%	12%	22%
27	Slovakia	48%	24%	43%
28	France	47%	5.5%	70%
29	Poland	47%	8.4%	37%
31	Spain	46%	6.1%	37%
33	Norway	45%	7.4%	4.2%
46	Italy	25%	-8.9%	-4.0%
62	South Africa	8.8%	27%	79%
63	Turkey	8.0%	–	-25%

Figure 24: Broadband (>4 Mbps) Connectivity, EMEA Country/Region

DID YOU KNOW?

Turkey and South Africa were the only two EMEA countries with broadband adoption rates below 10% in the third quarter, but since Q3 2007, broadband adoption has grown 900% in Turkey, and 176% in South Africa.

SECTION 7:
Mobile Connectivity

Building on the data presented in previous editions of the *State of the Internet Report*, Akamai continues to attempt to identify additional mobile networks for inclusion in the report, as well as filtering out networks subsequently identified as having proxy/gateway configurations that could skew results. The source data in this section encompasses usage not only from smartphones, but also laptops, tablets, and other devices that connect to the Internet through these mobile networks. In addition, this edition of the *State of the Internet Report* once again includes insight into mobile traffic growth and data traffic patterns contributed by Ericsson, a leading provider of telecommunications equipment and related services to mobile and fixed network operators globally.

As has been noted in prior quarters, the source data set for this section is subject to the following constraints:

- A minimum of 1,000 unique IP addresses connecting to Akamai from the network in the third quarter of 2012 was required for inclusion in the list.
- In countries where Akamai had data for multiple network providers, only the top three are listed, based on unique IP address count.
- The names of specific mobile network providers have been made anonymous, and providers are identified by a unique ID.
- Data is included only for networks where Akamai believes that the entire Autonomous System (AS) is mobile — that is, if a network provider mixes traffic from fixed/wireline (DSL, cable, etc.) connections with traffic from mobile connections on a single network identifier, that AS was not included in the source data set.
- Akamai's EdgeScape database was used for the geographic assignments.

7.1 Connection Speeds on Mobile Networks

In the third quarter of 2012, Russian provider RU-1 was once again the mobile network provider with the highest average connection speed, at just over 7.8 Mbps, a gain of approximately 300 kbps from the previous quarter. In reviewing the full list of providers shown in Figure 25, we find that there are seven providers (RU-1, AT-2, UA-1, CZ-3, DE-2, GR-1, AT-1) that had average connection speeds in the "broadband" (>4 Mbps) range. An additional 68 mobile providers had average connection speeds greater than 1 Mbps in the third quarter, including Thai provider TH-1, which just squeaked by with an average connection speed of 1001 kbps. The mobile provider with the lowest average connection speed was, once again, Nigerian provider NG-1, at 324 kbps (down 16 kbps from the previous quarter). Including NG-1, ten providers had average connection speeds below 1 Mbps in the third quarter.

Examining the average peak connection speed data for the third quarter of 2012, we find that Russian mobile provider RU-1 led this metric as well, with an average peak connection speed of 39.2 Mbps. UK-1, which was last quarter's leader at 44.4 Mbps, dropped back to fourth place in the third quarter, losing approximately 19 Mbps. It was noted in the second quarter that UK-1 had seen approximately 60% growth from the first quarter, and it appears to have given those gains back in the third quarter. Spanish mobile provider ES-1 joined RU-1 in having an average peak connection speed over 30 Mbps. Across the remaining surveyed providers, just five more (AT-2, UK-1, DE-2, NO-1, GR-1) had average peak connection speeds above 20 Mbps, while speeds above 10 Mbps were seen in an additional 39 providers. Only two mobile providers had average peak connection speeds below the 4 Mbps broadband threshold—Canadian provider CA-2 at 2.9 Mbps, and South African provider ZA-1 at 2.8 Mbps. ZA-1 was once again the mobile provider with the lowest average peak connection speed.

Country	ID	Q3 '12 Avg. kbps	Q3 '12 Peak kbps
ASIA			
China	CN-1	2192	6012
Hong Kong	HK-2	1905	10938
Hong Kong	HK-1	2226	18487
Indonesia	ID-1	707	12388
Kuwait	KW-1	1268	6907
Malaysia	MY-3	1400	9053
Malaysia	MY-2	2166	18994
Malaysia	MY-1	644	6119
Pakistan	PK-1	1287	6751
Qatar	QA-1	1296	9536
Saudi Arabia	SA-1	1187	5810
Singapore	SG-3	1385	7780
Sri Lanka	LK-1	1285	11085
Taiwan, Province of China	TW-1	1787	9249
Taiwan, Province of China	TW-2	1125	7015
Thailand	TH-1	1001	7089
EMEA			
Austria	AT-1	4465	16881
Austria	AT-2	7384	27214
Belgium	BE-1	3153	14369
Belgium	BE-3	1836	10230
Czech Republic	CZ-1	1765	8710
Czech Republic	CZ-3	5197	17127
Czech Republic	CZ-2	1296	8144
Egypt	EG-1	962	5117
Estonia	EE-1	1599	8311
France	FR-2	2599	9760
Germany	DE-1	1543	7311
Germany	DE-2	4985	23254
Germany	DE-3	2094	10510
Greece	GR-1	4897	21368
Hungary	HU-2	2351	12688
Hungary	HU-1	1626	8297
Ireland	IE-1	2962	15865
Ireland	IE-2	1882	17239
Ireland	IE-3	2369	18578
Israel	IL-1	1471	6910
Italy	IT-2	2998	15523
Italy	IT-3	3193	16817
Italy	IT-4	2006	13758
Lithuania	LT-2	2355	18700
Lithuania	LT-1	3291	19792
Moldova	MD-1	2208	11416
Morocco	MA-1	1125	10113

Country	ID	Q3 '12 Avg. kbps	Q3 '12 Peak kbps
Netherlands	NL-2	1589	4020
Netherlands	NL-1	2019	4951
Netherlands	NL-3	2108	10486
Nigeria	NG-1	324	5293
Norway	NO-1	3417	21888
Poland	PL-2	1712	8942
Poland	PL-1	2696	15366
Poland	PL-3	1741	11472
Romania	RO-1	1106	6676
Russia	RU-1	7834	39191
Russia	RU-4	3591	18476
Russia	RU-3	805	6600
Slovakia	SK-1	1629	9108
Slovenia	SI-1	2283	10298
South Africa	ZA-1	569	2787
Spain	ES-1	3860	33315
Turkey	TR-1	1813	9411
Ukraine	UA-1	5485	18988
United Kingdom	UK-3	2856	13604
United Kingdom	UK-2	2481	10611
United Kingdom	UK-1	2657	25348
NORTH AMERICA			
Canada	CA-2	1068	2895
El Salvador	SV-2	1904	12386
El Salvador	SV-1	1712	10477
El Salvador	SV-3	846	5109
Guatemala	GT-2	1631	11603
United States	US-1	2737	8198
United States	US-3	1352	4114
United States	US-2	2472	9776
OCEANIA			
Australia	AU-3	2453	14089
New Zealand	NZ-2	2082	11733
SOUTH AMERICA			
Argentina	AR-1	966	6871
Argentina	AR-2	2218	18055
Bolivia	BO-1	668	5360
Brazil	BR-1	988	8195
Brazil	BR-2	1445	10726
Chile	CL-3	1638	11731
Chile	CL-4	1215	12173
Colombia	CO-1	1216	6597
Paraguay	PY-2	1058	9880
Uruguay	UY-1	1716	14400
Venezuela	VE-1	1105	7148

Figure 25: Average and Average Peak Connection Speeds by Mobile Provider

While two of the three listed mobile providers in the United States were among the top 25 globally for average connection speeds, they were lower in the global rankings for average peak connection speed. In an effort to better understand the speeds being delivered by mobile network providers within the country, and how they compare to claims made by the providers, the U.S. Federal Communications Commission (FCC) announced in September that it would be meeting with interested parties to discuss ways in which to measure broadband performance[28]. The Public Notice[29] published by the FCC noted that "The FCC now proposes a program to develop information on mobile broadband service performance in the United States utilizing the collaborative model underlying the success of its fixed broadband program. As the Measuring Broadband America program has proven, the broadband performance data produced by the statistically sound methodology of the program allows comparisons and analyses that are valuable to consumers and spur competition among service providers."

7.2 Mobile Browser Usage Data

In June 2012, Akamai launched the "Akamai IO" destination site (http://www.akamai.com/io), with an initial data set that highlights browser usage across PC and mobile devices, connecting via fixed and mobile networks. Note that the current data set comes from sampling traffic across several hundred top-tier sites delivering content through Akamai, and that most of these sites are focused on a U.S. audience, so the data presented below is biased in favor of U.S. users. Back-end data collection and processing work is ongoing to expand the sample set, which will allow us to provide more global and geo-specific views of the data, as well as more granular insight into browser versions. We expect to launch the expanded data set in the first quarter of 2013, and will likely begin leveraging it starting with the *1st Quarter, 2013 State of the Internet Report*.

Figure 26 highlights observations made from traffic to Akamai during the third quarter of 2012 from users of mobile browsers identified to be on cellular networks.[30] The graph shows that Android Webkit once again accounted for the largest percentage of requests, though usage of Apple's Mobile Safari was close behind. In looking at overall average usage across the quarter,[31] Android Webkit was responsible for 37.6% of requests, while Mobile Safari drove 35.7% of requests. The figure shows that Opera Mini's share fluctuated around the 20% mark and was at 19.3% on average across the quarter. Research In Motion's Blackberry browser and Microsoft Mobile Explorer had the lowest usage among the top five browsers, averaging 4.2% and 1.5% respectively over the course of the third quarter. Nearly a dozen additional browsers were also observed, but in total, these accounted for just 1.7% of usage.

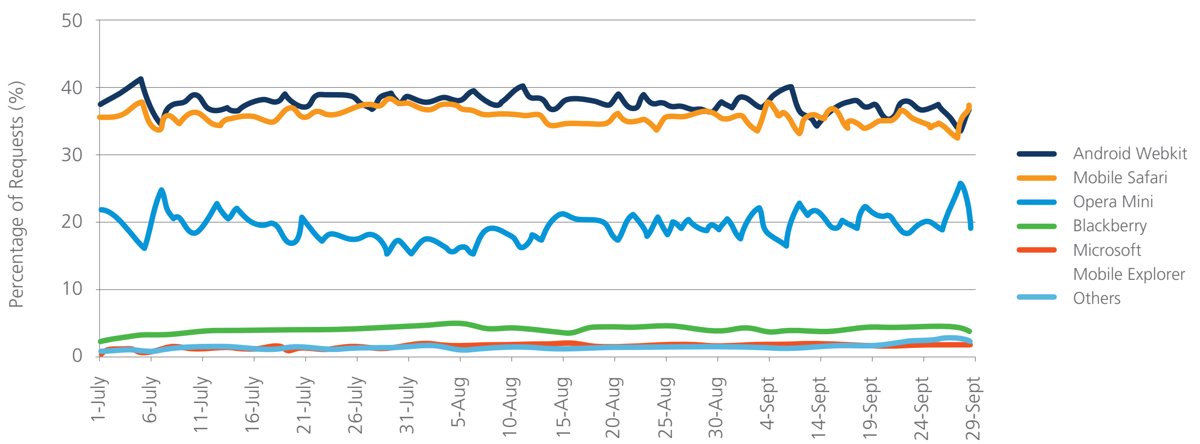

Figure 26: Mobile Browsers Seen Across Cellular Networks, Q3 2012

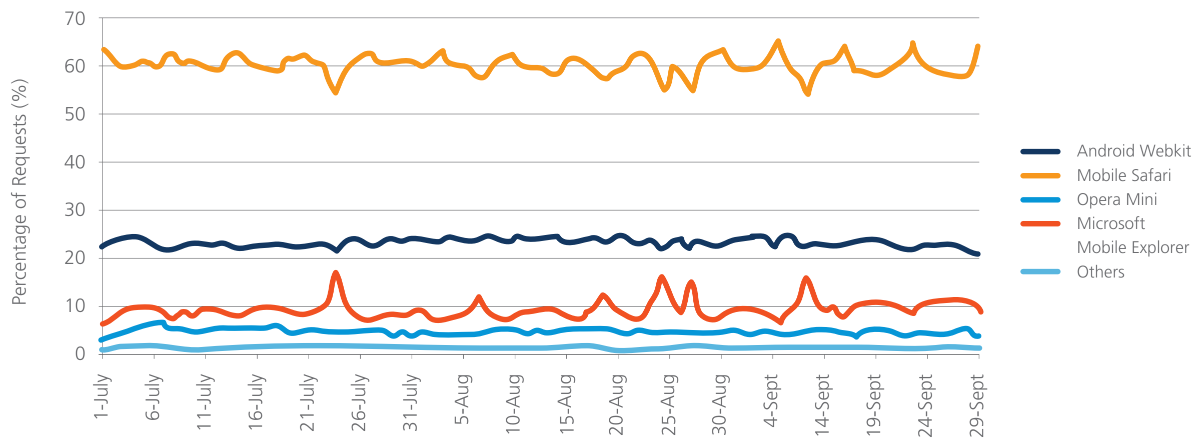

Figure 27: Mobile Browsers Seen Across All Networks, Q3 2012

When the scope is expanded to all networks[32] (not just those identified as "cellular"), a very different usage pattern becomes clear. As shown in Figure 27, Apple's Mobile Safari browser was once again far and away responsible for the majority of observed requests, fluctuating around the 60% mark on a daily basis, with an average across the quarter of 60.1%.[33] On the graph, Android Webkit remained in the 22–23% range, while Microsoft Mobile Explorer tended to remain just under 10%, peaking over it a few times, though a more steady growth pat-ternappeared to be emerging towards the end of the quarter. On a quarterly average basis, Android Webkit generated 23.1% of requests, while Microsoft Mobile Explorer was responsible for 9.3%. Opera Mini remained just below 5% on average, while the balance of the usage was made up of approximately a dozen additional browsers.

DID YOU KNOW?

According to data from Akamai IO:

- Across all networks in the third quarter, only Apple Mobile Safari, Android Webkit, and Microsoft Mobile Explorer were consistently responsible for more than 5% of requests.
- Across cellular networks in the third quarter, only Apple Mobile Safari, Android Webkit, and Opera Mini were consistently responsible for more than 5% of requests.
- Blackberry browser usage share on cellular networks increased from 3.1% to 4.1% during the third quarter, while it grew from just 0.9% to 1% across all networks.

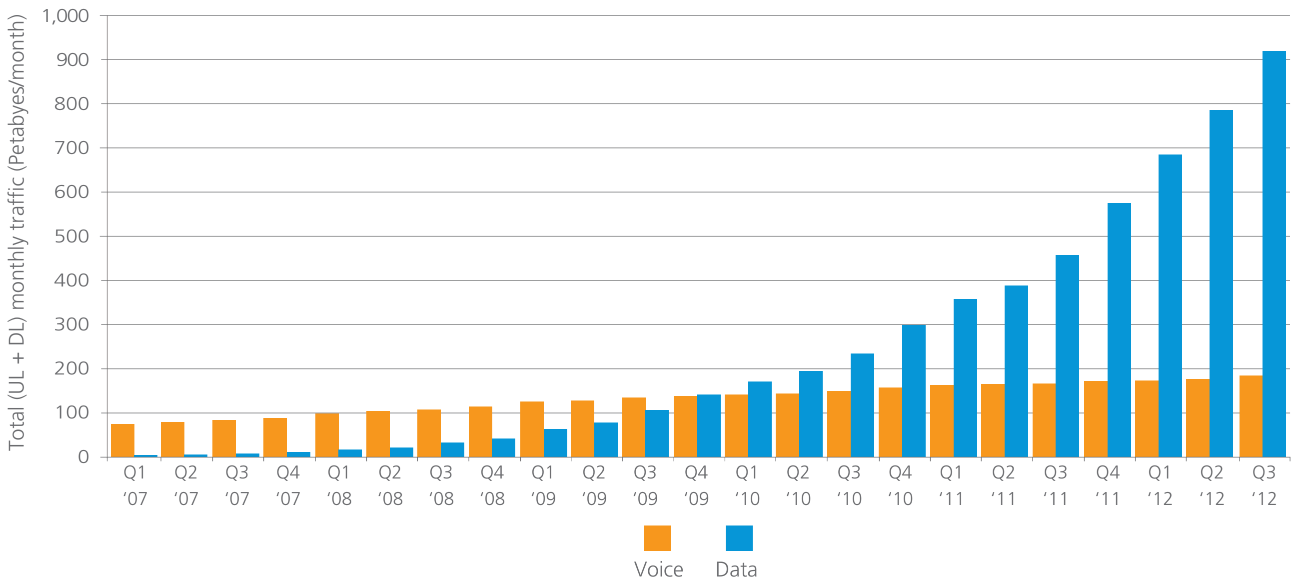

Figure 28: Total Monthly Mobile Voice and Data as Measured by Ericsson

7.3 Mobile Traffic Growth As Observed By Ericsson

In mobile networks, the access medium (spectrum) is being 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 enables 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, WiFi, 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 across markets and regions and also among operators due to their different customer profiles.

As illustrated in Figure 28, the volume of mobile data traffic doubled from the third quarter of 2011 to the third quarter of 2012, and grew 16% between the second and third quarter of 2012. Note that mobile voice traffic continues to grow as well, though at a much slower rate, increasing just 6% from the third quarter of 2011 to the third quarter of 2012.

7.4 2G vs. 3G Traffic

In this section, we examine GSM (2G) vs. WCDMA/HSPA (3G) traffic at different operators and analyze how radio capabilities of mobile devices and 3G network coverage impact mobile data traffic. Ericsson estimates that CDMA/GSM (2G) devices still represent almost 40% of all devices sold in the world. While many operators are now building out LTE (4G) coverage, most operators continue to expand their WCDMA/HSPA (3G) networks, although these still do not have the coverage 2G has, as illustrated by the graphs below. However, WCDMA/HSPA (3G) now covers more than 50 percent of the world population (see *Ericsson Mobility Report November 2012*[34]).

Ericsson regularly performs detailed traffic measurements in all major regions of the world. The measurements in this section were made in a selected number of mature commercial WCDMA/HSPA networks in Asia, Europe and the Americas between the third quarter of 2011 and the third quarter of 2012. Bar charts in this section show the minimum (bottom of the bar), maximum (top of the bar) and median values (darkest shaded area in the middle) among the selected networks. These results are of a general nature and can serve as indicators for transitions like CDMA to LTE or HSPA to LTE.

Almost all new mobile devices are 3G capable today in surveyed networks, as measured by Ericsson. However, there is still a large footprint of older devices in mobile networks with 2G-only (GPRS or EDGE) radio capabilities among feature phones and some smartphones, such as Blackberries, as shown in Figure 29. Furthermore, most mobile Machine to Machine (M2M) devices today are still only GPRS or EDGE capable, since most mobile M2M segments do not have significant throughput and latency requirements.

3G capable devices can also fall back to the 2G network when faced with limited 3G coverage. Depending on usage characteristics of different devices and applications, the impact of 3G coverage on data traffic can vary significantly.

Figure 30 shows the ratio of 2G traffic volume for different 3G capable devices. As it illustrates, going from mobile PCs to tablets and smartphones, the ratio of 2G traffic volumes increases, as greater mobility means a higher probability of encountering 3G coverage holes.

It is interesting to note also the large difference in 2G traffic ratios across mobile phones with different operating systems. This difference is mainly due to geographical differences in mobile phone penetration: large cities with good 3G coverage usually have a larger penetration of high-end smartphones while rural areas with larger 3G coverage holes usually have much larger ratio of low-end smartphones and feature phones. Measurements by Ericsson indicate that penetration of high-end smartphones can be up to 2–3 times smaller in rural areas than in dense urban areas of the same country.

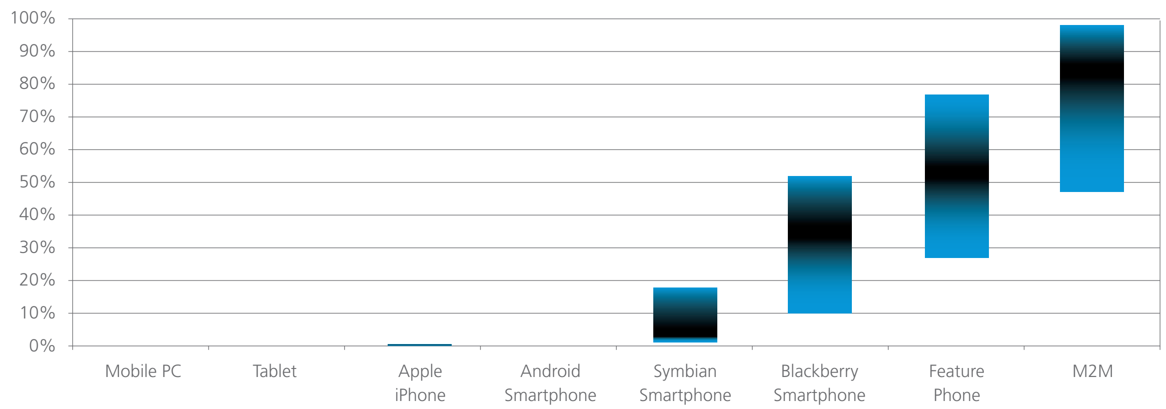

Figure 29: Ratio of Subscribers With 2G-only Devices

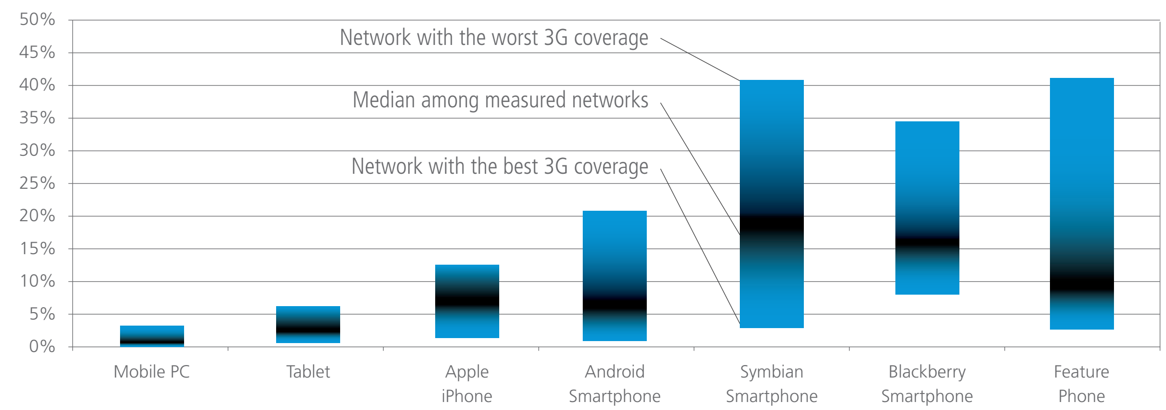

Figure 30: Ratio of 2G Traffic Volumes For Different Devices

Radio technology also has a major impact on application usage, as shown in Figure 31 and Figure 32. Figure 31 only includes 2G traffic while Figure 32 includes only 3G traffic (note that 2G traffic includes both traffic from 2G-only devices and 2G fallback traffic from 3G capable devices). Video and file sharing traffic usage practically disappears on 2G but traffic shares associated with Web browsing and email increase significantly. It is worth noting that 3G application usage also depends heavily on other factors, such as data plans, traffic management policies and availability of free or cheap online media content.

In addition to relative traffic volume shares, it is also interesting to examine the impact of 2G fallback on absolute per subscription traffic volumes. Figure 33 shows how per subscription smartphone traffic volumes decrease for devices spending more time on 2G fallback while Figure 34 visualizes the impact of 2G fallback separately for different applications. For both charts, the "x" axis shows the ratio of active minutes (when sending / receiving data traffic) spent on 2G fallback, while the "y" axis compares average per subscription traffic volumes to the subset of subscribers spending less than 2% of their active time on 2G fallback. Both charts show median values across the measured networks. Actual values can vary significantly between networks.

As expected, video traffic is the most sensitive to 2G fallback but all other interactive applications (e.g., Web browsing) also suffer a significant decrease in usage even when spending only a few percent of total active time on 2G fallback. For example,

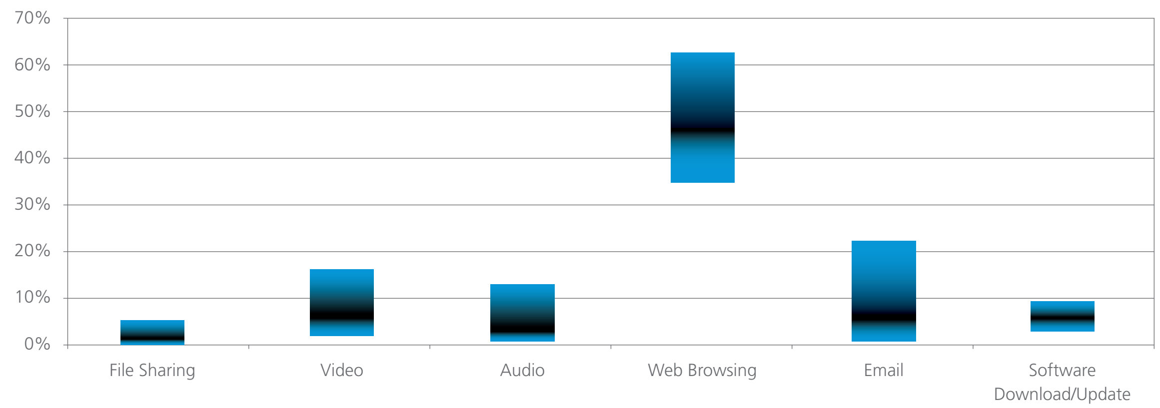

Figure 31: Application Volume Shares On 2G Access

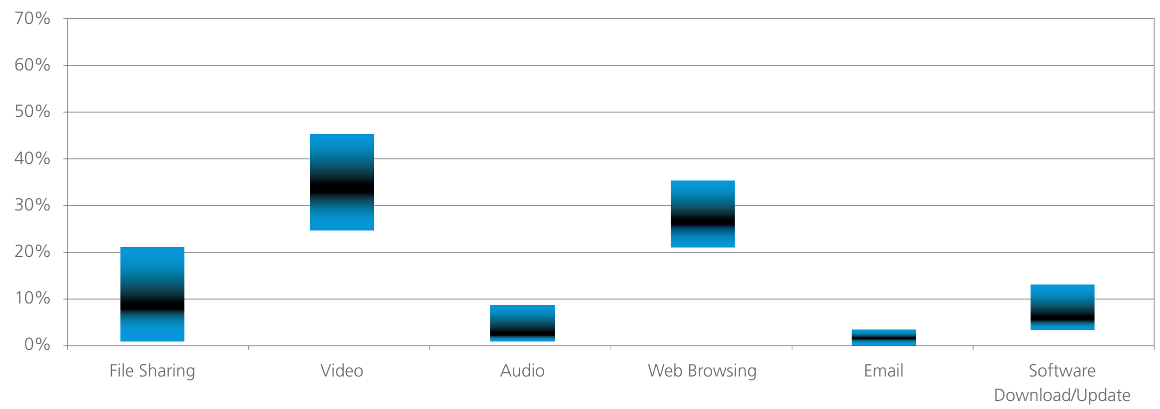

Figure 32: Application Volume Shares On 3G Access

smartphones spending 20% of their time on 2G fallback generate 50% less video traffic than smartphones spending less than 2% on 2G fallback. Background non-real time applications such as email are much less sensitive. Smartphones that periodically check email via POP3 or IMAP have higher chances to encounter unfavorable radio conditions—such as being on the move—which explains the unexpected absolute increase of email traffic volume between 0-20% 2G fallback time.

Since smartphones are extensively used on the move, good 3G (or 4G) coverage along popular commuting paths is important to ensure good user experience for interactive smartphone applications. Even just a few percent of active time spent on 2G fallback can result in a significant decrease in usage (likely due to the resultant user experience problems).

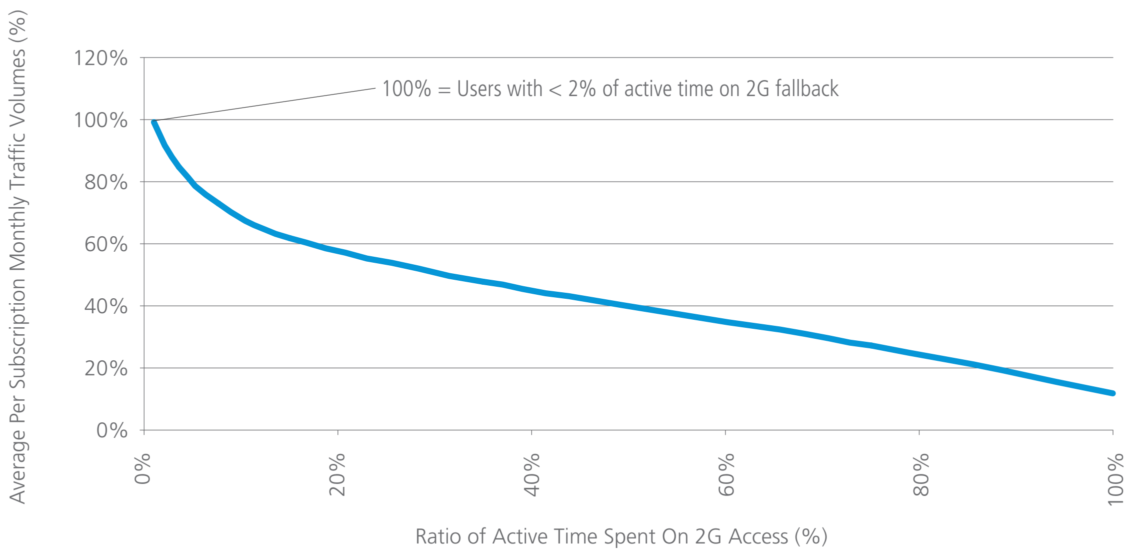

Figure 33: Impact of 2G Fallback On Average Per Subscription Traffic Volumes

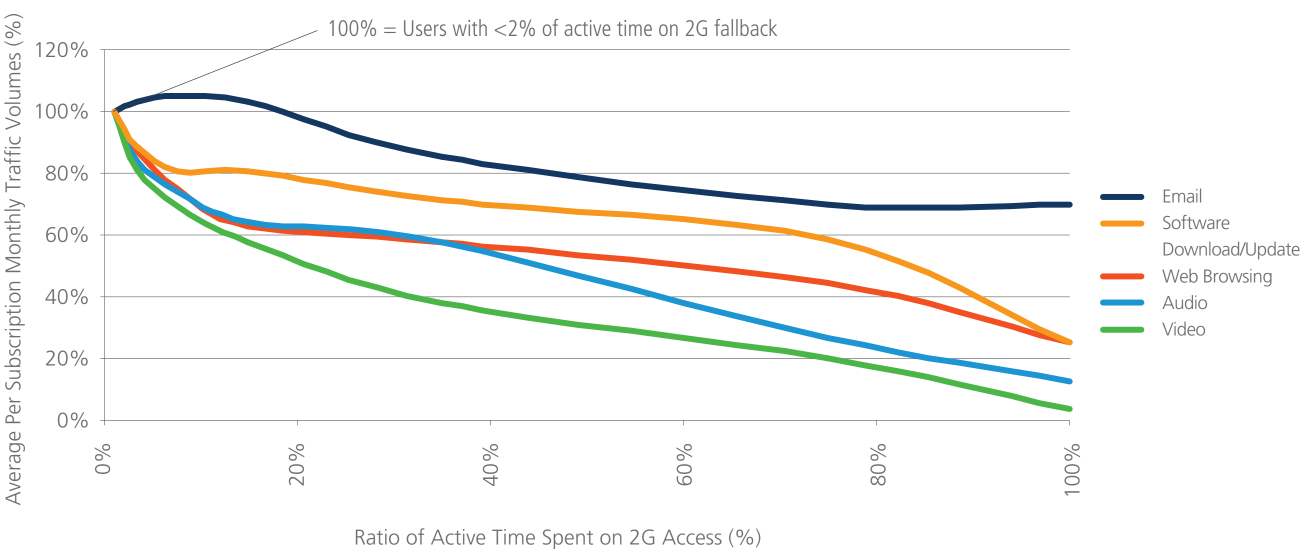

Figure 34: Impact of 2G Fallback On Application Usage

LEGEND FOR APPLICATION CATEGORIES:

File Sharing: P2P file sharing applications (e.g. BitTorrent, Gnutella, etc.) and one-click file hosting services (over FTP or HTTP).

Video: Progressive download online video traffic over HTTP (e.g., YouTube), real time or semi-real time video streaming (e.g., over RTP, RTSP or RTMP) and Online TV or video on demand applications using P2P content delivery networks (e.g., PPStream, PPlive, Funshion, etc.).

Audio: Online radios (e.g., Pandora, Spotify, Radio, etc.).

Web Browsing: Umbrella category for all activities performed from a browser, e.g., news sites, social networking, etc. Please note that media applications used from within a Web browser (e.g., YouTube videos, Web TV, etc.) are classified separately and are not included into web browsing traffic.

Email: Email traffic sent and received using the following protocols: SMTP (Simple Mail Transfer Protocol), POP3 (Post Office Protocol v3) or IMAP (Internet Message Access Protocol). Web-mail from the most popular sites (Gmail, Yahoo, etc.) is also included.

Software Download/Update: Operating system (e.g., Windows) updates, anti-virus updates on PCs and app-store downloads on smartphone and tablets.

8.1 Lebanon

On July 2, Lebanon experienced an Internet disruption that lasted nearly three hours, due to problems with the IMEWE submarine cable that links Lebanon and Cyprus.[35] According to network monitoring firm Renesys, the country is dependent on the cable for international Internet connectivity.[36] Renesys noted that the disruption occurred between 16:13 and 18:59 UTC, and as Figure 35 illustrates, HTTP traffic delivered by Akamai to users in Lebanon was significantly impacted during that time. The graph shows traffic dropping to near-zero as the disruption started, with gradual recovery over the next several hours. Traffic peaked once full connectivity was restored, and then settled back into the standard diurnal pattern.

According to Lebanese news Web site The Daily Star, "In February 2012, the Telecommunications Ministry made a preliminary agreement with Cyprus over a new submarine cable dubbed EUROPA. In addition to boosting Internet connection speeds and capacities, the cable will serve as a back-up cable, preventing a complete blackout when IMEWE fails."[37] However, the article also notes that at the time of publication (July 2, 2012), the Lebanese government had yet to give approval for the project, which carried a USD $10 million price tag.

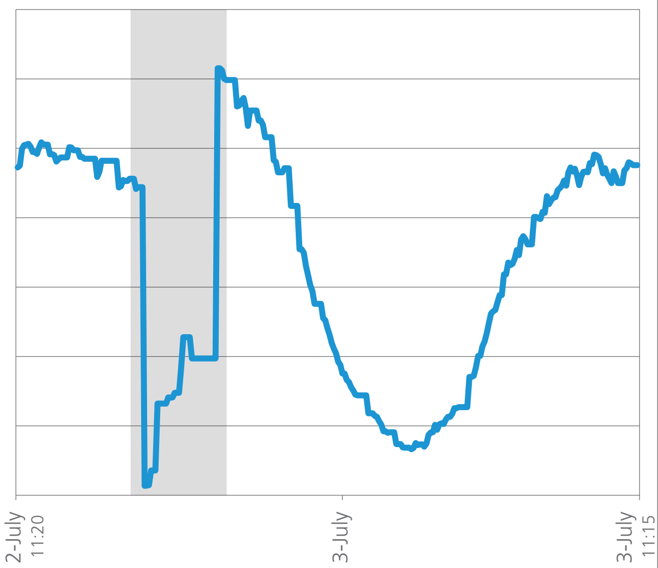

Figure 35: HTTP Traffic Served to Lebanon, July 2-3, 2012

8.2 Syria

On July 19, network monitoring firm Renesys observed[38] that all of the local Internet provider networks that are routed through the Syrian Telecommunications Establishment were withdrawn from the global routing table, which effectively severed international Internet connectivity for most of Syria. The Syrian Telecommunications Establishment is affiliated with the government of Syria[39], and it serves as the primary incumbent telecommunications provider through which local Syrian network providers gain international Internet access.

As shown in Figure 36, HTTP traffic delivered by Akamai to users in Syria dropped to zero for just under an hour, starting at approximately 13:30 PM UTC. This aligns with the observations from Renesys that routes to the affected Syrian networks were unavailable from 13:32 UTC to 14:12 UTC. Although this disruption was brief in nature, it was by no means isolated, as it followed other similar disruptions observed in prior quarters. In addition, a longer multi-day disruption of Internet connectivity in Syria occurred in late November—this will be covered in next quarter's report.

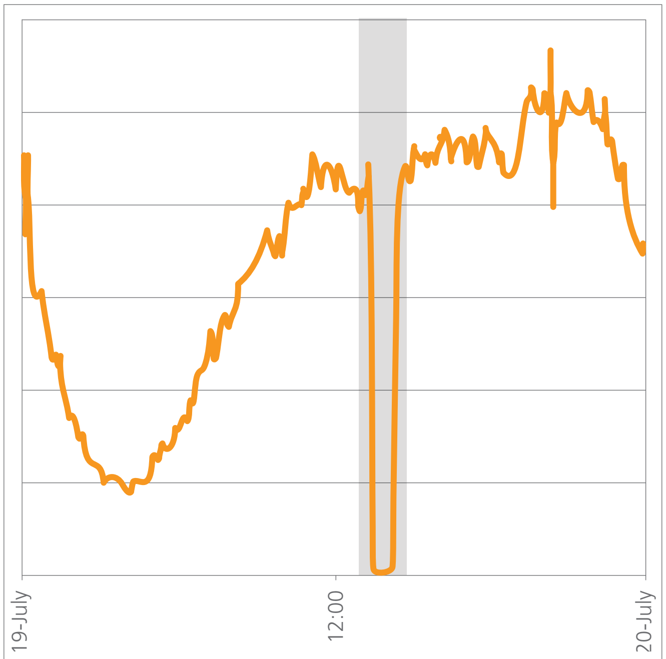

Figure 36: HTTP Traffic Served to Syria, July 19, 2012

8.3 Jordan

Figure 37 illustrates the impact of two Internet disruptions that occurred in Jordan on August 14. The first occurred at approximately 10:30 UTC, lasting for about two-and-a-half hours. The graph of HTTP traffic delivered by Akamai to users in Jordan shows a sharp decline as the disruption starts, with traffic returning and settling back into the expected pattern just after 13:00 UTC. In addition, it appears that another problem occurred between 16:00 and 17:00 UTC, with traffic dropping approximately 75% for a brief period. The first disruption was observed by others[40, 41] as well, and published reports[42] indicated that the disruption was due to "a cut in power supply to Jordan's main Internet and data services stations".

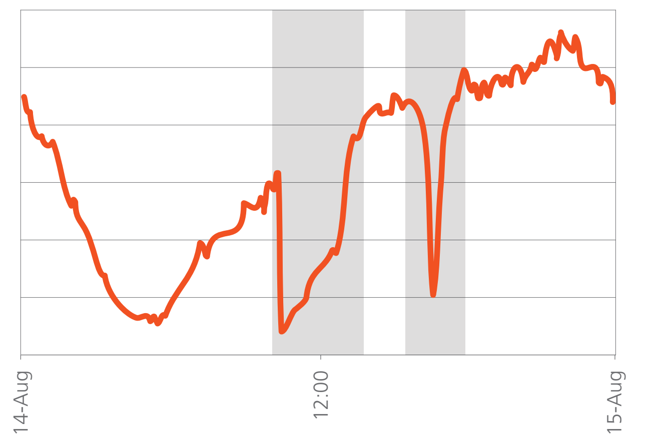

Figure 37: HTTP Traffic Served to Jordan, August 14, 2012

8.4 Go Daddy

According to published reports, on September 10, 2012, customers of DNS and Web hosting service provider Go Daddy experienced an outage lasting approximately five hours that ultimately left as many as five million Web sites inaccessible, in addition to creating problems for e-mail delivery.[43, 44] Go Daddy manages more than 54 million domain names[45] and when its DNS servers became unavailable, end users could no longer resolve Web site hostnames, and mail servers could no longer resolve hostnames of other mail servers to pass e-mail messages to. An alleged member of 'hacktivist' group Anonymous was quick to take responsibility[46] for what they claimed to be a denial-of-service attack. However, a press release subsequently issued by Go Daddy[47] indicated that the company had "determined the service outage was due to a series of internal network events that corrupted router data tables."

On October 4, Go Daddy CIO Auguste Goldman published a blog post[48] entitled *The "Inside Story" about What Happened at GoDaddy.com Sept. 10, 2012* that provided a longer, more technical explanation of the causes of the outage. In short, Go Daddy cited a combination of router memory exhaustion (due to route forwarding tables growing to 210x normal route count), router hardware failure modes (where processing fell back to software mode, leading to CPUs quickly becoming overloaded), and containment (where incorrect routes were spread beyond a single location). While the post does not explain what caused the route forwarding tables to grow so much larger than normal, it does highlight several steps that Go Daddy plans to take to prevent a similar incident from reoccurring in the future.

Figure 38: The initial Tweet from @GoDaddy acknowledging the problems that were occurring[49]

SECTION 9:
Appendix

Region	% Attack Traffic	Unique IP Addresses	Avg. Connection Speed (Mbps)	Peak Connection Speed (Mbps)	% Above 10 Mbps*	% Above 4 Mbps*
EUROPE						
Austria	0.1%	2,427,889	6.5	24.7	12%	58%
Belgium	0.1%	4,462,564	6.7	32.7	16%	68%
Czech Republic	0.4%	2,152,005	7.6	27.3	15%	68%
Denmark	0.1%	2,759,121	7.2	26.5	17%	68%
Finland	<0.1%	2,741,964	6.8	25.0	16%	59%
France	0.9%	25,585,394	4.8	19.6	4.1%	47%
Germany	1.3%	36,529,907	5.9	26.0	8.4%	60%
Greece	0.2%	2,897,382	4.0	21.7	1.8%	30%
Hungary	1.3%	2,626,388	5.8	30.0	8.4%	62%
Iceland	<0.1%	150,364	5.3	24.2	--	37%
Ireland	0.1%	1,616,493	6.7	26.4	11%	50%
Italy	1.6%	18,180,191	3.9	19.2	2.7%	25%
Luxembourg	<0.1%	168,009	4.7	18.4	--	44%
Netherlands	0.4%	8,695,063	8.5	30.7	22%	82%
Norway	<0.1%	3,529,611	6.2	23.2	15%	45%
Poland	0.9%	8,394,814	5.3	25.1	9.3%	47%
Portugal	0.2%	3,134,259	4.8	29.8	4.8%	53%
Romania	2.6%	2,646,244	6.4	37.4	11%	64%
Russia	4.4%	16,056,368	5.1	23.9	7.7%	52%
Slovakia	0.1%	908,108	5.8	26.2	7.6%	48%
Spain	0.9%	13,210,373	4.8	26.0	5.0%	46%
Sweden	0.2%	6,482,900	6.8	26.9	16%	50%
Switzerland	0.1%	3,301,330	8.7	32.4	22%	81%
Turkey	4.1%	9,682,770	2.8	19.6	0.6%	8.0%
United Kingdom	0.8%	26,416,728	6.3	28.1	11%	62%
ASIA/PACIFIC						
Australia	0.2%	8,803,575	4.3	22.8	4.1%	38%
China	32%	98,959,738	1.6	7.1	0.2%	3.9%
Hong Kong	0.9%	2,904,068	9.0	54.1	27%	71%
India	2.4%	13,873,381	1.0	8.0	--	1.5%
Indonesia	1.1%	3,499,049	1.2	13.8	--	1.8%
Japan	1.2%	40,293,015	10.5	42.2	38%	75%
Malaysia	0.6%	2,113,813	2.2	18.2	--	12%
New Zealand	0.2%	1,995,257	3.9	17.8	2.4%	35%
Singapore	0.2%	1,447,319	4.9	30.7	6.9%	42%
South Korea	1.4%	19,771,924	14.7	48.8	52%	86%
Taiwan	4.3%	11,600,240	4.4	28.5	4.7%	38%
Vietnam	1.0%	4,691,092	1.3	8.6	--	1.2%
MIDDLE EAST & AFRICA						
Egypt	1.0%	2,485,868	1.2	7.7	--	---
Israel	0.7%	2,278,201	5.6	30.9	7.0%	56%
Kuwait	0.1%	932,814	1.9	13.8	--	--
Saudi Arabia	0.3%	3,806,376	1.7	9.0	--	1.2%
South Africa	0.5%	6,017,605	2.1	6.8	2.0%	8.8%
Sudan	<0.1%	181,454	0.8	5.8	--	--
Syria	<0.1%	567,293	1.7	6.3	--	--
United Arab Emirates (UAE)	0.5%	1,219,244	5.7	n/a	9.7%	56%
LATIN & SOUTH AMERICA						
Argentina	1.1%	7,198,694	2.1	14.5	--	9.1%
Brazil	3.6%	22,554,472	2.3	16.4	0.5%	12%
Chile	0.5%	3,092,853	3.0	20.6	--	13%
Colombia	0.8%	5,011,502	2.7	14.3	--	9.6%
Mexico	0.5%	11,753,996	2.8	14.4	0.5%	11%
Peru	0.8%	1,045,654	1.9	13.5	--	--
Venezuela	0.7%	2,760,444	1.0	8.3	--	--
NORTH AMERICA						
Canada	0.7%	13,608,622	6.7	27.2	12%	70%
United States	12%	145,002,042	7.2	29.6	18%	62%

** Countries listed with "—" had fewer than 25,000 unique IP addresses connecting to Akamai during the third quarter at this speed. Based on the revised threshold for inclusion, they were not included in the global ranking.*

Endnotes

[1] http://www.telegeography.com/products/commsupdate/articles/2012/09/06/global-internet-capacity-reaches-77tbps-despite-slowdown/
[2] http://www.broadbandcommission.org/Documents/bb-annualreport2012.pdf
[3] http://transition.fcc.gov/Daily_Releases/Daily_Business/2012/db0904/DA-12-1442A1.pdf
[4] http://pastebin.com/u/QassamCyberFighters
[5] https://www.arin.net/knowledge/rirs.html
[6] ftp://ftp.arin.net/pub/stats/arin/delegated-arin-latest
ftp://ftp.apnic.net/apnic/stats/apnic/delegated-apnic-extended-latest
ftp://ftp.ripe.net/pub/stats/ripencc/delegated-ripencc-latest
ftp://ftp.afrinic.net/pub/stats/afrinic/delegated-afrinic-latest
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