Akamai

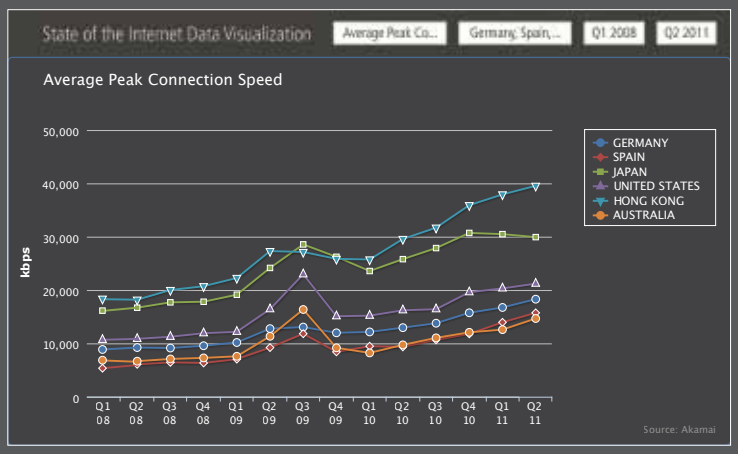
VOLUME 4, NUMBER 3

The State of the Internet

3RD QUARTER, 2011 REPORT

INCLUDES INSIGHT ON MOBILE TRAFFIC AND CONNECTED DEVICES FROM ERICSSON

Get the most out of the **State of the Internet** with our new Data Visualizations



- View trends over time for key metrics from the report across the top 100 countries/regions as well as U.S. states
- Compare trends across geographies
- Save & print customized graphs

- View key metric values for any country around the world
- Compare values across countries
- Zoomable interface

Letter From the Editor

"In the last decade, we have gone from a connected world (thanks to the end of the cold war, globalization and the Internet) to a hyperconnected world (thanks to those same forces expanding even faster)."

– Thomas L. Friedman, writing in the New York Times (*http://nyti.ms/w2y6BQ*)

This shift to an increasingly "hyperconnected" world has been clearly illustrated within the *State of the Internet* report series, as we've tracked growth in Internet connectivity, connection speeds, and more recently, mobile usage. Hyperconnectivity has driven adoption of the cloud among both enterprises and consumers and has also brought a renewed focus to security, a topic that the *State of the Internet* report series has long sought to highlight.

In November 2011, Akamai launched a corporate blog at *https://blogs.akamai.com/*, which is intended to provide highlights from the latest news at Akamai, in addition to insight on living and working in a hyperconnected world. *State of the Internet*-related content will be posted to the blog from time-to-time, and going forward, we hope to more closely integrate these blog posts with the report. *State of the Internet*-specific blog posts can be found at *https://blogs.akamai.com/state-of-the-internet/*.

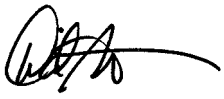
In conjunction with this quarter's report, we've launched a second data visualization tool at *http://www.akamai.com/stateoftheinternet*, which allows users to users to select a metric of interest and view the current quarter's values for that metric on a (zoomable) map by hovering the pointer over a country of interest. We think that this new visualization will be of interest to those looking for information on countries not specifically covered in the report, or for those looking to compare metric values for countries in close physical proximity to one another. In the future, we will look to include state-level data for the United States within this mapping tool. The graphing data visualization tool launched in conjunction with the 1st Quarter, 2011 report has also been updated to include 3rd quarter data.

Unsurprisingly, security on the Internet and Web remained an extremely hot topic during the third quarter, with issues around SSL continuing to feature heavily in the industry press, as well as concerns about botnets and DDoS attacks. In this issue, we've continued to mine data collected from Akamai's secure content delivery network, examining trends observed in the use and distribution of SSL ciphers used by Web clients. In addition, members of Akamai's Security Intelligence team have provided insight into the compromise of Diginotar, the Dutch SSL Certificate Authority, as well as the emergence of attacks generated by the BitCoin Miner Botnet, and what these mean for the security of online sites and applications.

Ericsson, a key technology partner for Akamai, has once again contributed unique insight derived from its vantage point in the mobile ecosystem. Usage "caps" imposed by mobile providers in an effort to manage network resources have been an extremely contentious subject since their introduction, and this quarter, Ericsson's contribution examines the impact of these usage caps on data consumption patterns, and how these patterns differ based on the size of the usage cap and the penalty imposed on the subscriber for exceeding the cap.

Next quarter's report will close out the 4th volume of the *State of the Internet* report series, and it is exciting to see the progress that the report has made from its original 16 pages. The 4th Quarter, 2011 report will likely be one of the largest issues to date, as we plan to cover topics including:

- A 2011 "look back", examining trends seen in key metrics across the year
- A full-year examination of IPv4 exhaustion across the Regional Internet Registries, as well as a full-year examination of IPv6 adoption (based on data collected by Hurricane Electric)
- An overview of DDoS attacks targeting customers that leverage Akamai for site and application acceleration
- A look at reported Internet outages & disruptions that occurred in the 4th quarter.



David Belson

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Executive Summary

Akamai's globally distributed network of servers allows us to gather massive amounts of information on many metrics, including connection speeds, attack traffic, and network connectivity/availability/latency problems, as well as traffic patterns on leading Web sites. Each quarter, Akamai publishes a "*State of the Internet*" report. This report includes data gathered from across Akamai's Intelligent Platform during the third quarter of 2011 about attack traffic, broadband adoption, and mobile connectivity, as well as trends seen in this data over time. In addition, this quarter's report also includes insight into SSL, the state of IPv6 adoption, and observations from Akamai partner Ericsson regarding the impact that mobile data plans have on usage.

Security

During the third quarter of 2011, Akamai observed attack traffic originating from 195 unique countries/regions. Indonesia became the top attack traffic source, accounting for 14% of observed attack traffic in total. Taiwan and China held the second and third place spots, respectively, accounting for just under 20% of observed attack traffic combined. Myanmar, which appeared suddenly at the head of the top 10 list in the first and second quarters, dropped out of the top 10 just as suddenly this quarter. Attack traffic concentration increased slightly from the second quarter, with the top 10 ports seeing 68% of observed attack traffic. Attacks targeting Port 80 (WWW/HTTP) dropped by about a third as compared to the second quarter, while attacks targeting Port 23 (Telnet) grew by almost the same amount. While an ongoing study of client-side SSL cipher trends continues to indicate a shift towards stronger ciphers, the compromise of a Dutch certificate authority highlighted that the security of SSL must be considered at all touch points, and especially with the organization signing the certificates.

Internet and Broadband Adoption

Akamai observed a 1.8% increase (from the second quarter of 2011) globally in the number of unique IPv4 addresses connecting to Akamai's network, growing to over 615 million. Looking at connection speeds, the global average connection speed was 2.7 Mbps, and the global average peak connection speed was 11.7 Mbps. At a country level, South Korea had the highest average connection speed, at 16.7 Mbps, as well as the highest average peak connection speed, at 46.8 Mbps. At a city level, cities in Japan and South Korea continued to hold many of the top spots in the rankings of highest average and average peak connection speeds. Globally, high broadband (>5 Mbps) adoption grew to 29% in the third quarter, and South Korea had the highest level of high broadband adoption, at 79%. Global broadband (>2 Mbps) adoption increased slightly to 66%, with Bulgaria continuing to have the highest level of broadband adoption, at 96%. Global narrowband (<256 kbps) adoption continued to decline, dropping to 2.5%. Libya's 55% narrowband adoption rate placed it as the country with the highest level of connections in this speed range.

Mobile Connectivity

Reviewing third quarter observed attack traffic from known mobile networks, overall attack traffic concentration declined from the prior quarter, with the top 10 countries generating 76% of observed attacks. The list of top ports targeted remained consistent with the second quarter, with Port 445 remaining the target of an overwhelming majority of observed attacks as compared to the other ports in the top 10. In the third quarter of 2011, average connection speeds on known mobile providers ranged from 6.1 Mbps down to 327 kbps. Average peak connection speeds in the quarter ranged from 22.2 Mbps to 1.4 Mbps. Looking at mobile content consumption, users on nine mobile providers consumed, on average, more than one gigabyte (1 GB) of content from Akamai per month, while users on an additional 75 mobile providers downloaded more than 100 MB of content from Akamai per month during the third quarter. In addition, based on data collected by Ericsson, mobile data traffic continued to double on a year-over-year basis, and grew 18% between the second and third quarters of 2011.

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 attack traffic, as observed and measured by Akamai, during the third quarter of 2011.

1.1 Attack Traffic, Top Originating Countries

During the third quarter of 2011, Akamai observed attack traffic originating from 195 unique countries/regions, up from 192 in the second quarter. After making its first appearance in the top 10 list in recent memory in the second quarter, Indonesia vaulted to the top of the list this quarter, generating 14% of observed attack traffic, as shown in Figure 1. Myanmar, which had suddenly appeared at the top of the list in the prior two quarters, disappeared from the list just as suddenly in the third quarter, potentially indicating that the attack traffic that had been observed originating from the country has either been shut down, or is now coming from other places. With Myanmar dropping out of the top 10 list, South Korea moved into it, more than tripling its observed level of attack traffic, responsible for 3.8% in the third quarter. In addition to South Korea and Indonesia, Taiwan, China, India, and Egypt were all responsible for higher percentages of attack traffic as compared to the prior quarter.

It is unclear whether Indonesia will follow Myanmar in making an appearance among the top 10 countries for a few quarters, or if it will remain one of the top attack traffic-originating countries over the long term. Similar to those coming from Myanmar, the attacks from Indonesia observed in the third quarter also primarily targeted Ports 80 and 443, with 53% targeting Port 80, and 43% targeting Port 443.

In examining the continental distribution of observed attack traffic in the third quarter, we found that just over 49% originated in the Asia Pacific/Oceania region, up from 47% last quarter; Europe originated nearly 28%, down from 30% last quarter; North & South America originated nearly 19%, down from 20% last quarter; and the remaining 4% came from Africa, up from 3% in the second quarter.

1.2 Attack Traffic, Top Ports

As shown in Figure 2, attack traffic concentration among the top 10 ports declined slightly as compared to the second quarter, with the top 10 ports accounting for 68% of the observed attacks (down from 70% in the second quarter). Port 445 remains at the top of the list, down slightly from last quarter, and continues to be responsible for less than 40% of the observed attacks – a level that it has maintained through 2011. The volume of attacks targeting Port 23 (Telnet) grew by approximately 28% as compared to the second quarter, and the volume of attacks targeting Ports 443 (HTTPS/SSL), 1433 (Microsoft SQL Server), 135 (Microsoft-RPC) and 3389 (Microsoft Terminal Services) increased slightly quarter-over-quarter as well.

The growth in attacks targeting Port 23 is likely due to attacks apparently sourced in Egypt and South Korea – in Egypt there were over 18x as many attacks targeting Port 23, and in South

	Country	Q3 '11 % Traffic	Q2 '11 %
1	Indonesia	14%	7.4%
2	Taiwan	11%	10%
3	China	8.6%	7.8%
4	United States	7.3%	8.3%
5	Russia	7.2%	7.5%
6	Brazil	5.5%	5.6%
7	South Korea	3.8%	1.1%
8	India	3.7%	2.7%
9	Egypt	3.3%	2.7%
10	Romania	2.4%	2.7%
–	Other	33%	36%

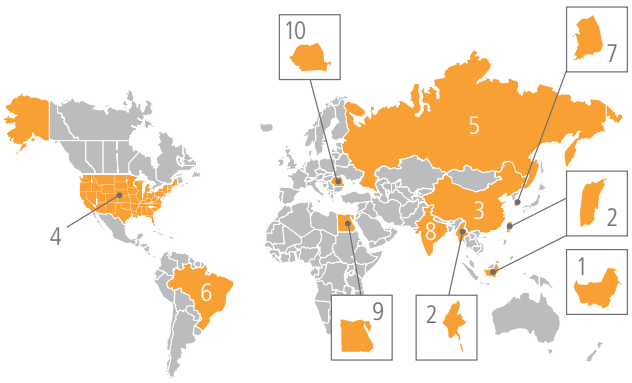
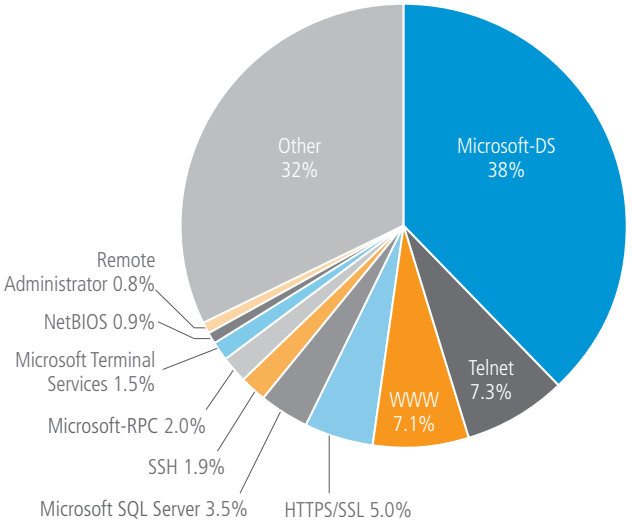


Figure 1: Attack Traffic, Top Originating Countries

Port	Port Use	Q3 '11 % Traffic	Q2 '11 %
445	Microsoft-DS	38%	39%
23	Telnet	7.3%	5.7%
80	WWW (HTTP)	7.1%	11%
443	HTTPS/SSL	5.0%	4.6%
1433	Microsoft SQL Server	3.5%	2.6%
135	Microsoft-RPC	2.0%	1.7%
22	SSH	1.9%	1.9%
3389	Microsoft Terminal Services	1.5%	1.2%
139	NetBIOS	0.9%	1.2%
4899	Remote Administrator	0.8%	0.8%
Various	Other	32%	–

Figure 2: Attack Traffic, Top Ports



Korea, nearly 4x as many attacks as the next most targeted port, which was Port 445 in both countries. It is very interesting to note that a year ago, in the *3rd Quarter, 2010 State of the Internet* report, we also highlighted significant growth in attacks targeting Port 23, and noted that it was overwhelmingly a top targeted port for attacks apparently sourced in Egypt. While this may be coincidental, it does raise the question of whether there is some local phenomenon that accounts for this repeated increase in attack traffic during the third quarter in two consecutive years.

As we did last quarter, Akamai once again reviewed observed attack traffic data shared by a public/private sector security alliance (that prefers not to be named). While this data showed that there were some similarities in the ports being targeted, with eight of its top 10 ports also on Akamai's top 10 list, the distribution of percentages continued to be significantly different, with Port 139 (NetBIOS) responsible for nearly two-thirds of the alliance's observed attacks.

1.3 SSL Insight, Client-Side Ciphers

In addition to the large number of requests for content that Akamai serves over HTTP (Port 80), the Akamai Intelligent Platform also services millions of requests per second for secure content over HTTPS/SSL (Port 443). Customers of Akamai's Secure Content Delivery services include leading social networking providers, financial services companies, e-commerce sites, software and SaaS providers, and public sector agencies. This massive volume of encrypted traffic provides Akamai with a unique perspective on the client-side SSL ciphers that are in popular use, as well as their usage trends over time. For a discussion of what an SSL cipher is, how they work, and regulations that specify the use of particular ciphers, please refer to Section 1.3 of the *2nd Quarter, 2011 State of the Internet* report. The statistics presented in this section are for SSLv3 and TLSv1.

Figure 3 illustrates the breakdown of SSL ciphers presented by Web clients (generally browsers) to Akamai's Secure Content Delivery Network during the third quarter of 2011. While slight variations can be observed throughout the course of the quarter, the quarterly trends observed for the five highlighted SSL

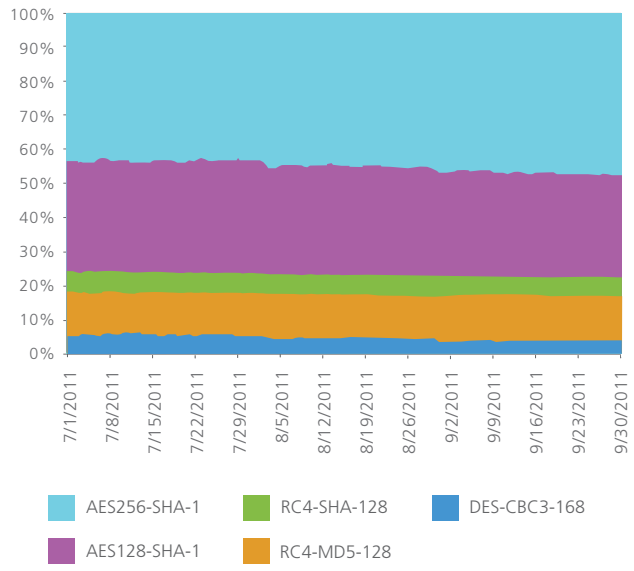


Figure 3: Client Side SSL Ciphers Observed by Akamai, Q3 2011

ciphers continued to be in line with those observed in the second quarter. The use of both AES256-SHA-1 and AES128-SHA-1, considered to be more secure ciphers due to being harder to decrypt, increased during the third quarter, with AES256-SHA-1 growing from 43.8% to 47.8% and AES-128-SHA-1 growing from 31.7% to 32.7%. The use of DES-CBC-SHA-168, RC4-SHA-128, and RC4-MD5-128 all declined, with RC4-MD5-128 seeing the largest loss, dropping from 14.3% to 11.0% during the quarter.

Looking at year-over-year changes in cipher usage amplifies just how significant the changes have been over time. The use of EXP-DES-CBC-SHA-40 has almost completely disappeared over the last year, accounting for less than a hundredth of a percent in the third quarter. As shown in Figure 4, use of the RC4 and DES-based ciphers has also declined significantly over the last year. However, strong growth was seen in use of the AES-based ciphers, with AES128-SHA-1 growing by nearly 20%, while AES256-SHA-1 increased significantly, up 75% year-over-year. The quarterly figures shown are a mathematical average of the daily cipher usage observations, calculated across the third quarter of 2010 and 2011.

Cipher	Q3 2010	Q3 2011	YoY Change
RC4-MD5-128	24.9%	11.9%	-52%
RC4-SHA-128	6.8%	5.2%	-24%
EXP-DES-CBC-SHA-40	4.8%	< 0.1%	-100%
DES-CBC3-SHA-168	9.7%	4.4%	-55%
AES128-SHA-1	28.0%	33.3%	19%
AES256-SHA-1	25.8%	45.2%	75%

Figure 4: Year-over-Year Changes in Client Side Cipher Usage

As online security becomes increasingly more important, and as more retail traffic and enterprise applications migrate to the Web, we believe that the trends highlighted here will continue over the long term, with the more secure AES-based ciphers constituting the overwhelming majority of the SSL ciphers presented to Akamai's Secure Content Delivery Network. As noted last quarter, Akamai can also enable customers to disable the use of weak ciphers, thereby providing increased security for e-commerce sites and business-critical applications accelerated by Akamai. Additional information on Akamai's Security Solutions, including a white paper that explores Akamai's security capabilities, can be found at *http://www.akamai.com/security*.

1.4 SSL Certificate Authority Compromise

One of the largest information security stories of the year was the compromise of the Dutch Certificate Authority (CA), Diginotar. This company was an intermediate CA for the Dutch government and much of its PKIoverheid (or PKIgovernment) program, and as such, held a highly trusted position within the digital certificate infrastructure that the Dutch government relies on to support its secure Web-based applications.

According to a forensic investigation by security company FOX-IT, the original Diginotar compromise occurred on July 17th, 2011 due to lax security practices and a lack of basic security controls. As a compromised CA, Diginotar's signing authority was used to create over 500 fraudulent certificates across at least 20 separate domains, including *.google.com. The compromise was detected on July 19th, but Diginotar did little or nothing at the time, other than to revoke some of the fraudulent certificates. The compromise started to come to the attention of a wider audience on August 28th, when a user in Iran noticed an untrusted certificate warning issued by his Web browser. Later that week, Google, Microsoft and Mozilla all revoked Diginotar's standing as a trusted CA in their respective browsers (Chrome, Internet Explorer and Firefox respectively), effectively ending Diginotar's ability to issue certificates. The Dutch government switched to other CAs on September 3rd, and on September 20th, 2011 it was announced that Diginotar had declared voluntary bankruptcy.

The full repercussions of the Diginotar breach remain unknown. Because of poor logging and lack of security controls, it is impossible to know beyond doubt what fraudulent certificates were issued and may be used by attackers. The Iranian government or someone sympathetic to it may have used these fraudulent certificates in order to perform man-in-the-middle attacks against Gmail users in Iran, since this was one of the incidents that brought the entire compromise to light.

As a CA, Diginotar was trusted by many high profile clients, not the least of which was the Dutch government. Diginotar had a duty to take its responsibility seriously, but reports indicate that the company took minimal or no effort to provide even basic protections for its infrastructure. Additionally, the fact that Diginotar continued to ignore the problem and only responded when forced to nearly six weeks after the compromise was noticed was an inexcusable lapse by the company.

CAs are increasingly coming under attack, because of the value of the SSL keys they can issue. Microsoft, Google, Mozilla and other browser developers are working to provide a set of audit guidelines for CAs, but that is a work in progress, without any current, unifying set of standards. Instead of waiting for this to be completed, companies need to review which CAs they have selected to issue digital certificates, and verify that it is not simply the lowest price alternative. If security is important to a company, it is critical to make sure that it is also important to the company that is providing the SSL keys that are used to sign its certificates.

1.5 BitCoin Miner Botnet

The third quarter also saw an interesting DDoS campaign that targeted some Akamai customers, and was related to the digital currency BitCoin (*http://bitcoin.org*). BitCoin relies on cryptographic algorithms to create ("mine" in the BitCoin lexicon) individual coins (tokens) with an increasing scarcity over time. Early BitCoin "miners" used dedicated systems and video card (GPU) processing to perform the mathematical calculations but, as the scarcity of coins generated increased, the processing power and electricity required to generate coins outpaced the value of the coin that was created.

The BitCoin Miner "bot" was created as a piece of desktop malware that used host computer resources to perform mining functions. It used peer-to-peer networking for resiliency in command and control. In late August, the malware authors added the ability for the BitCoin Miner bot to function as a DDoS bot in order to force target sites to pay BitCoins as part of (what would commonly be called) a protection racket. Targeted sites received an email stating "*Your site [target hostname] will be subjected to DDoS attacks 100 Gbit/s. Pay 100 btc(bitcoin) on the account 1QATZUB6m8ZR5AWxnLi4Ygw7iYBq1gqJFJ.*"

Targets of the BitCoin Miner bot were hospitality, food, real estate, and travel sites, all residing in Germany's top-level domain (.de). The attack used a variety of request templates to send HTTP traffic with varying targeted URL, User-Agent, and browser signatures. After a run of several weeks, the attack traffic waned. Akamai customer sites that were targeted were not impacted by the attempted DDoS attacks, as Akamai was able to absorb and/or block the attack traffic, preventing it from reaching the customer's origin infrastructure.

The BitCoin Miner bot had some interesting characteristics that make it stand out. The first was the relationship to BitCoin. The bot herders transitioned from mining coins to attacking Web sites to generate income. The second was the choice of targets: typical victims of such attacks are gaming, pornography, e-Commerce, insurance, and banking sites. In contrast, the BitCoin Miner bot targeted pizza ordering and travel booking sites.

Internet Penetration

2.1 Unique IPv4 Addresses

Through a globally-deployed server network, and by virtue of the more than one 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 2011, over 615 million unique IPv4 addresses, from 239 countries/regions, connected to the Akamai network – 1.8% more than in the second quarter of 2011, and 15% more than in the third quarter of 2010. 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 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, quarterly growth among the top 10 countries was mixed in the third quarter, with three countries seeing quarterly increases in unique IP address counts, while seven saw quarterly declines, most of which were rather minor. We do not believe that these quarterly declines are any cause for concern, as they are, for the most part, minimal, and could be due to a number of possible causes, including shifts in IP address block utilization/assignment by local network service providers or changes in Akamai's EdgeScape IP geolocation tool. Despite the declines among these top countries, quarterly growth was seen in a majority of countries/regions during the third quarter.

Looking at year-over-year changes, we find that all of the top 10 countries saw increased unique IP address counts, with Brazil, Italy, and China all seeing yearly growth of 25% or more. Globally, nearly 200 countries/regions saw year-over-year growth. While short term (quarterly) declines in unique IP address counts may be seen from time-to-time, as we experienced this quarter, we expect that long term (yearly) trends will continue to be positive across most countries. However, it appears that the rate of yearly change may be slowing across the top countries. This trend is clearly evident in the United States, which saw yearly change of just over 3% in the third quarter, as compared to just over 9% in the second quarter, and 10% in the first quarter of 2011. Of the remaining top 10 countries, all except for China saw lower rates of yearly change this quarter than in the prior quarter – China's rate of yearly change remained consistent.

The unique IP address count across the top 10 countries represented just under 68% of the global figure, a concentration level just slightly lower than the prior quarter. In looking at the "long tail", there were 185 countries/regions with fewer than one million unique IP addresses connecting to Akamai in the third quarter of 2011, 135 with fewer than 100,000 unique IP addresses, and 31 with fewer than 1,000 unique IP addresses. Only the sub-100,000 threshold count increased from the prior quarter.

As more end-user networks roll out native IPv6 connectivity to their subscribers, and as more and more popular content is made available over IPv6, the number of unique IPv4 addresses making requests to Akamai from a given network provider may decline. Over the long-term, we expect measurements to show movement of unique addresses from IPv4-based to IPv6-based.

	Country	Q3 '11 Unique IP Addresses	QoQ Change	YoY Change
–	Global	615,666,128	1.8%	15%
1	United States	145,452,027	1.4%	3.1%
2	China	81,661,744	6.8%	27%
3	Japan	44,014,718	-1.8%	17%
4	Germany	34,501,208	-1.2%	9.5%
5	France	24,185,767	-0.5%	5.3%
6	United Kingdom	22,439,229	-2.9%	3.6%
7	South Korea	19,889,809	-13%	6.3%
8	Brazil	16,262,525	5.4%	25%
9	Italy	14,352,738	-0.1%	26%
10	Spain	13,065,839	-0.5%	9.3%

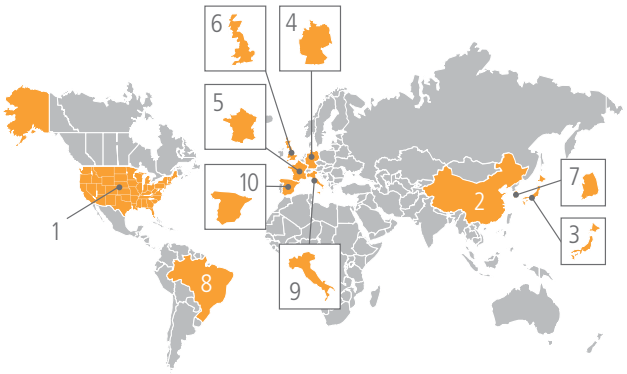


Figure 5: Unique IPv4 Addresses Seen By Akamai

2.2 IPv6 Adoption

As Akamai rolls out IPv6 support across our solution portfolio over the next several quarters, 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 network. However, until such time that we can include comprehensive Akamai data on IPv6 adoption, we will continue to look to third-party data.

Hurricane Electric 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."[1] A white paper[2] 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. In preparing this white paper, Hurricane Electric developed a set of measurement tools, the output of which is now published on its "Global IPv6 Deployment Progress Report" page, available at *http://bgp.he.net/ipv6-progress-report.cgi*.

Hurricane Electric's Global IPv6 Deployment Progress Report tracks a number of metrics, including DNS, Usenet, routing tables, performance/latency, and top Web sites. For the purposes of this quarter's report, we chose to review current-year and historical third quarter statistics for two metrics: "IPv6 ASes" and "ASes using only IPv6". The "IPv6 ASes" metric tracks the total number of autonomous systems (network identifiers) in the IPv6 routing table, whereas "ASes using only IPv6" tracks the total number of autonomous systems using only IPv6. The count of "IPv6 ASes" is a superset of "ASes using only IPv6", and there is no way to reach "ASes using only IPv6" over IPv4 -- the "IPv6 ASes" may also have entries in the IPv4 routing table. While these counts provide 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 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 not directly associated with end-user connectivity/traffic.

Figure 6 tracks the growth of the number of autonomous systems in the global IPv6 routing table during the third quarters of 2009, 2010, and 2011. One immediate observation is that the rate of growth between the third quarters of 2010 and 2011 was much greater than the rate of growth between 2009 and 2010 – over 1700 ASes were added to the routing table in the 2010-11 period, whereas just over 600 were added in the 2009-10 period. In analyzing the underlying data, some additional observations can be made. In looking at third quarter rates of growth, we note that the growth rate for 2011 (9.1%) was lower than the levels seen for 2010 (12.2%) and 2009 (13.7%), even though more ASes were added (392) in 2011 than in 2010 (280) or 2009 (202). However, this comparatively

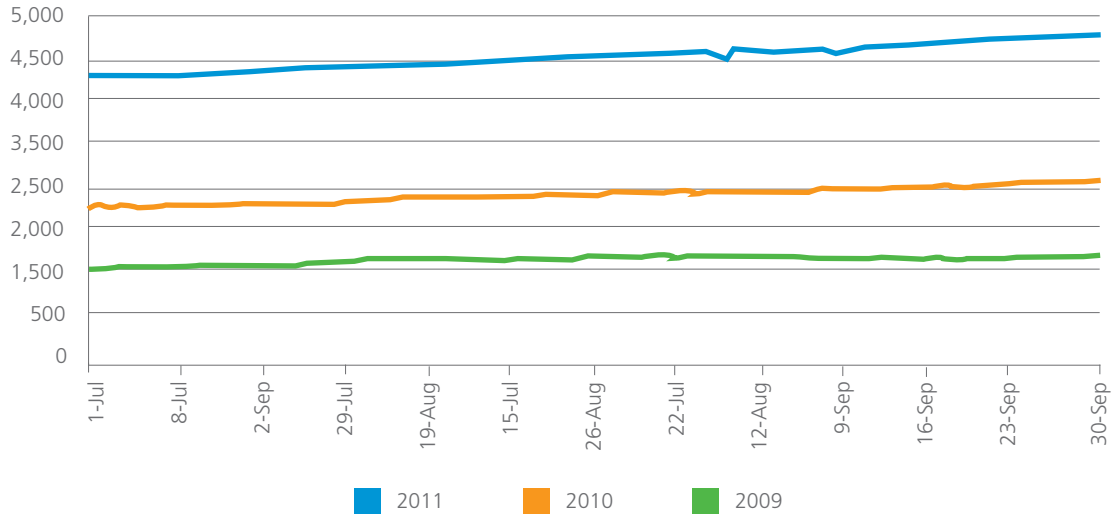


Figure 6: Total Number of Autonomous Systems in the IPv6 Routing Table

smaller rate of growth in 2011 may be an artifact of the significantly higher growth seen in the second quarter – 773 ASes were added, equating to a 21.9% increase.

Trends in the growth of IPv6-only ASes across the third quarters of 2011, 2010, and 2009 are shown in Figure 7. Similar to Figure 6, one immediate observation is that the rate of growth between the third quarters of 2010 and 2011 was much greater than the rate of growth between 2009 and 2010 – 27 IPv6-only ASes were added in the 2010-11 period, while only 10 were added in the 2009-10 period. Interestingly, growth in the total number of IPv6-only ASes was flat during the third quarter of 2011, though it grew by 9.1% in the third quarter of 2010, and 3.7% in the third quarter of 2009. Once again, the second quarter of 2011 was a particularly active one, with the number of IPv6-only ASes growing 43.2% during the quarter – this may have influenced the lack of growth seen in the third quarter.

The significantly higher growth rates seen across both metrics in the second quarter may be related to preparations for World IPv6 Day, which was organized by the Internet Society as a 24-hour "test flight" of IPv6 for real-world use under controlled conditions. Additional discussion of World IPv6 Day can be found in Section 2.3 of the *2nd Quarter, 2011 State of the Internet* report.

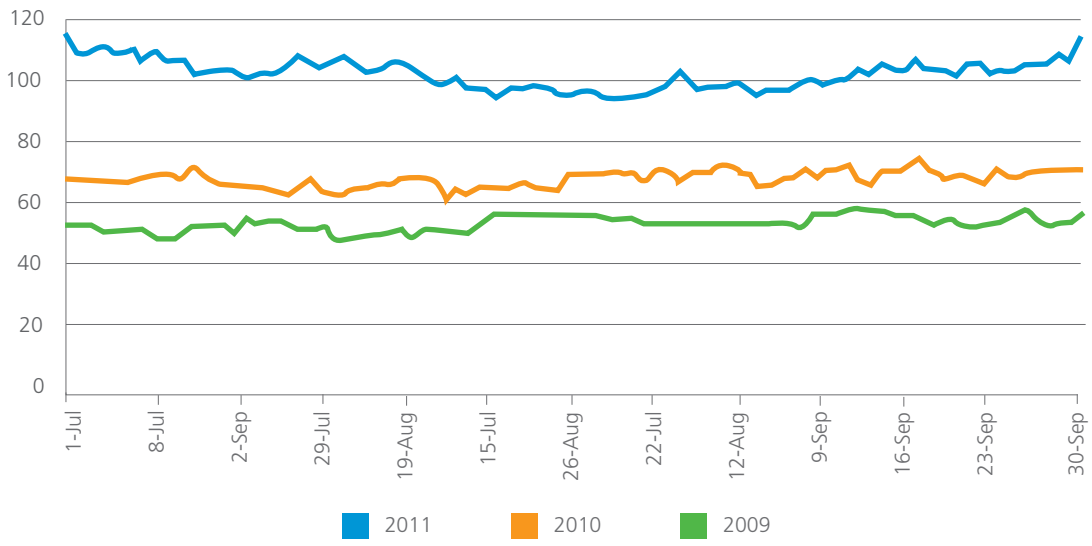


Figure 7: Total Number of IPv6-Only Autonomous Systems

DID YOU **KNOW?**

- *China set a precedent by presenting the first major event [2008 Beijing Olympic Games] to implement IPv6 and Russia is already planning to implement IPv6, at the 2014 winter Olympics in Sochi. As it stands, the technical community has not been informed of IPv6 plans at the London Olympics.*

[Source: http://www.techweekeurope.co.uk/comment/londons-olympics-could-lose-the-ipv6-race-40430]

SECTION 3:
Geography – Global

By virtue of the approximately one trillion requests for Web content that it services on a daily basis through its globally-deployed server network, Akamai has a unique level of visibility into the connection speeds of end-user systems and, consequently, into broadband adoption around the globe. Because Akamai has implemented a distributed network model, deploying servers within edge networks, it can deliver content more reliably and consistently at those speeds, in contrast to 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[3] or the video explanation at http://*www.akamai.com/whytheedge.*

The data presented within this section was collected during the third quarter of 2011 through Akamai's globally deployed server network and includes all countries/regions that had more than 25,000 unique IP addresses make requests for content to Akamai during the quarter. (Note that the threshold for inclusion was increased to 25,000 unique IP addresses starting with the *1st Quarter, 2011 State of the Internet* report, up from the 1,000 unique IP address threshold that was used from 2008-2010.) For purposes of classification within this report, the "high broadband" data included below is for connections greater than 5 Mbps, and "broadband" is for connections of 2 Mbps or greater. In contrast, the "narrowband" data included below is for connections to Akamai that are slower than 256 kbps. A quarter-over-quarter change is shown within the tables in several sections below in an effort to highlight short-term trends, and year-over-year changes are shown to illustrate longer-term trends.

In addition to providing data on average connection speeds, we continue to report on average peak connection speeds around the world, from a country, state, and city perspective. This metric provides insight into the peak speeds that users can likely expect from their Internet connections.

Finally, traffic from known mobile providers 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.

3.1 Global Average Connection Speeds

The global average connection speed continued to increase in the third quarter of 2011, climbing 4.5% to 2.7 Mbps, as shown in Figure 8. Though Denmark's 13% growth in the second quarter pushed Ireland out of the top 10, Ireland's strong 15% growth in the third quarter moved it back into the top group, dropping Belgium from the list. In addition to Ireland, South Korea also grew in excess of 10% in the third quarter, increasing to an average connection speed of 16.7 Mbps with a quarter-over-quarter change of 17%. Hong Kong, Japan, Latvia, and Switzerland also experienced quarterly growth in average connection speeds, as did the United States, which placed thirteenth globally. Minor quarter-over-quarter declines in average connection speeds among the top 10 countries were seen in the Netherlands, the Czech Republic, Romania, and Denmark. Globally, 86 countries that qualified for inclusion saw quarter-over-quarter increases, while 47 saw a quarter-over-quarter decline – changes ranged from 151% growth in the small French territory of New Caledonia in the southwest Pacific Ocean, to an 82% loss in Libya, which had challenges maintaining stable Internet connectivity in 2011, due to political unrest within the country.

The global average connection speed continued to see extremely strong yearly growth, increasing 39% from the third quarter of 2010. Nine of the countries among the top 10 saw average connection speeds grow year-over-year, as did the United States. Of those, Japan was the only country to grow less than 10%, seeing a yearly change of just 5.8% -- it appears that Japan's quarterly and yearly growth rates slowed in the third quarter, though it isn't clear why that happened. Romania was the only country among the top 10 that saw a year-over-year decline – last quarter, it saw a 0.1% decline as well. From a global perspective, the long-term growth trends are extremely positive, with 123 countries that qualified for inclusion increasing average connection speeds year-over-year, while just 10 saw average connection speeds drop year-over-year. These 10 countries are spread across Africa, Asia, Europe, and

	Country	Q3 '11 Avg. Mbps	QoQ Change	YoY Change
–	Global	2.7	4.5%	39%
1	South Korea	16.7	17%	18%
2	Hong Kong	10.5	2.0%	14%
3	Japan	8.9	0.3%	5.8%
4	Latvia	8.9	7.9%	47%
5	Netherlands	8.5	-0.6%	34%
6	Switzerland	7.5	3.0%	40%
7	Czech Republic	7.3	-1.7%	33%
8	Ireland	7.0	15%	57%
9	Romania	6.6	-2.6%	-5.5%
10	Denmark	6.3	-1.2%	25%
…				
13	United States	6.1	5.7%	23%

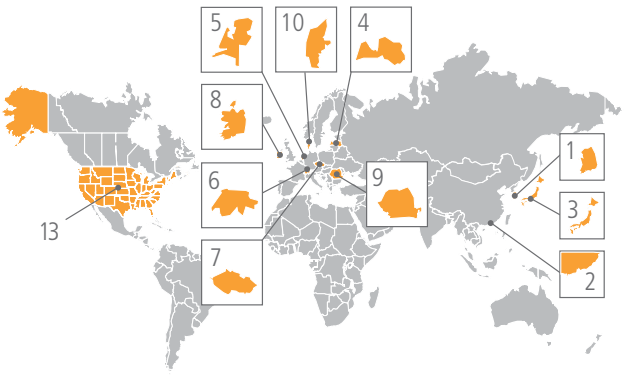


Figure 8: Average Measured Connection Speed by Country

South America, so the declines did not appear to be a specific regional trend. Tunisia once again saw the largest decline, dropping 56% year-over-year, to 1.3 Mbps.

During the third quarter, 31 countries had average connection speeds of 1 Mbps or less, up from 29 in the second quarter. Libya returned to its place as the slowest of the set, with an average connection speed of 0.3 Mbps.

3.2 Global Average Connection Speeds, City View

As we have done in previous editions of the *State of the Internet* report, in examining average measured connection speeds at a city level, we have applied filters for unique IP address count (50,000 or more seen by Akamai in the third quarter of 2011) and academic institutions (removing data from known academic networks). As with the other data sets used in Section 3 of this report, traffic from known mobile networks has been removed as well.

As shown in Figure 9, South Korean cities Taegu and Taejon remained at the top of the list of the fastest cities in the world – the average connection speed in Taegu grew more than 5 Mbps quarter-over-quarter, while Taejon increased just over 4 Mbps, enabling both cities to achieve average connection speeds above 20 Mbps in the third quarter. San Jose, California dropped out of the top 10 this quarter, moving the top city in the United States to thirteenth place globally. Amsterdam, Netherlands grew nearly 1.5 Mbps quarter-over-quarter to an average connection speed of 9.5 Mbps, and was the top European city, at number 33 globally. Twenty-seven cities among the top 100 achieved average connection speeds in excess of 10 Mbps in the third quarter, down from 29 cities in the prior quarter – this includes the two South Korean cities that topped 20 Mbps. The slowest speed on the list (7.2 Mbps in Timisoara, Romania) was slightly higher than that seen in the second quarter as well (6.9 Mbps in Santa Barbara, California).

Cities in the Asia Pacific region again constituted the majority among the top 100 in the third quarter, holding 65 spots on the list, including Hong Kong, one in Australia, six in South Korea, and 57 in Japan. Twenty-five cities from North America made the list, including 23 in the United States and two in Canada. The remaining ten cities were from eight countries in Europe, with the Czech Republic and Switzerland both having two cities each on the list.

In reviewing the full global list of nearly 900 cities that qualified for inclusion in this section, the fastest cities in other geographies included Johannesburg, South Africa (Africa), with an average connection speed of 1.8 Mbps, and Curitiba, Brazil (South America) with an average connection speed of 3.4 Mbps.

	Country	City	Q3 '11 Avg. Mbps
1	South Korea	Taegu	21.5
2	South Korea	Taejon	20.1
3	South Korea	Anyang	18.2
4	South Korea	Kimchon	18.0
5	South Korea	Seoul	16.9
6	Japan	Shimotsuma	15.5
7	Japan	Kanagawa	14.5
8	South Korea	Suwon	14.4
9	Japan	Tokai	14.3
10	Japan	Urawa	14.1
11	Japan	Yokohama	13.6
12	Japan	Asahi	13.5
13	United States	San Jose, CA	13.0
14	Japan	Tochigi	12.7
15	Japan	Hiroshima	12.4
16	Japan	Nagano	11.8
17	Japan	Ibaraki	11.8
18	Japan	Nagoya	11.4
19	Japan	Shizuoka	11.1
20	Japan	Chiba	11.0
21	Japan	Gifu	10.8
22	Japan	Kyoto	10.5
23	Japan	Toyonaka	10.5
24	Japan	Kobe	10.4
25	Hong Kong	Hong Kong	10.2
26	Japan	Osaka	10.1
27	Japan	Nara	10.0
28	Japan	Wakayama	9.9
29	Japan	Sendai	9.9
30	Japan	Marunouchi	9.8
31	Japan	Fukuoka	9.7
32	Japan	Tokushima	9.5
33	Netherlands	Amsterdam	9.5
34	Japan	Yokkaichi	9.3
35	Japan	Otsu	9.3
36	Japan	Hyogo	9.2
37	Japan	Fukui	9.1
38	Japan	Hakodate	9.1
39	Japan	Kochi	9.1
40	Japan	Fukushima	9.0
41	United States	Plano, TX	8.9
42	Japan	Hamamatsu	8.9
43	Japan	Matsuyama	8.8
44	Japan	Niigata	8.8
45	Japan	Niho	8.8
46	Latvia	Riga	8.7
47	United States	Fremont, CA	8.6
48	Japan	Hodogaya	8.6
49	Japan	Soka	8.6
50	Japan	Saga	8.6
51	Japan	Kanazawa	8.5
52	United States	North Bergen, NJ	8.5
53	Japan	Utsunomiya	8.5
54	Japan	Kokuryo	8.4
55	Japan	Yamaguchi	8.4
56	Japan	Tokyo	8.4
57	Japan	Okayama	8.3
58	Australia	Canberra	8.3
59	Switzerland	Geneva	8.3
60	Japan	Mito	8.2
61	United States	Jersey City, NJ	8.2
62	United States	Fredericksburg, VA	8.2
63	United States	Monterey Park, CA	8.1
64	Japan	Yamagata	8.1
65	Japan	Kumamoto	8.1
66	Japan	Tottori	8.1
67	Japan	Miyazaki	8.1
68	United States	Boston Metro, MA	8.0
69	Japan	Kagoshima	8.0
70	Japan	Kofu	8.0
71	Japan	Yosida	7.9
72	Switzerland	Zurich	7.9
73	Ireland	Dublin	7.9
74	Japan	Aomori	7.9
75	Czech Republic	Brno	7.9
76	United States	Staten Island, NY	7.8
77	Japan	Kagawa	7.7
78	United States	Fairfield, CA	7.7
79	Ukraine	Kyyiv	7.7
80	United States	Union, NJ	7.6
81	United States	Everett, WA	7.6
82	Canada	Victoria, BC	7.6
83	United States	Riverside, CA	7.6
84	United States	Norwalk, CT	7.6
85	United States	Columbia, MD	7.6
86	United States	Oakland, CA	7.6
87	United States	Manchester, NH	7.5
88	Japan	Nagasaki	7.5
89	Japan	Akita	7.5
90	Czech Republic	Ceska	7.5
91	United States	Federal Way, WA	7.4
92	United States	San Mateo, CA	7.4
93	United States	Hollywood, FL	7.4
94	United States	Cherry Hill, NJ	7.4
95	United States	Spartanburg, SC	7.3
96	Spain	Valencia	7.3
97	Canada	Oakville, ON	7.2
98	United States	Muncie, IN	7.2
99	Japan	Sapporo	7.2
100	Romania	Timisoara	7.2

Figure 9: Average Connection Speed, Top Global Cities

3.3 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 in order to mitigate the impact of unrepresentative maximum measured connection speeds. In contrast to the average measured connection speed, the average peak connection speed metric 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.) Note that data from known mobile networks has also been removed from the source data set for this metric.

The global average peak connection speed remained above 10 Mbps in the third quarter, growing 2.4% quarter-over-quarter to 11.7 Mbps. Average peak connection speeds grew from the prior quarter in nine of the top 10 countries, as well as the United States, as shown in Figure 10. South Korea saw the largest quarterly growth, at 31%, though Latvia and the United States both posted solid increases of 9% or more. Portugal was the only country among the top 10 that saw a quarterly decline, dropping just under 5% to 25 Mbps. Globally, 93 qualifying countries/regions experienced quarter-over-quarter growth in average peak connection speeds, from an 83% increase in French territory New Caledonia (to 13.9 Mbps) to Belgium's slight 0.3% increase (to 26.9 Mbps).

Looking at year-over-year changes, the global average peak connection speed grew by almost half as compared to the third quarter of 2010. All of the top 10 countries, as well as the United States, saw long-term growth in average peak connection speeds; Japan was the only one of the group to post a year-over-year change below 10%. Globally, yearly growth was seen in 127 qualifying countries, with only six posting declines. Seven countries/regions had yearly growth levels in excess of 100%, led by New Caledonia (once again), which increased just over 300% year-over-year. Only six countries saw yearly growth levels below 10% -- the smallest increase was in Uruguay, at 1.9% (to 5.8 Mbps).

South Korea regained its position as the country with the highest average peak connection speed, at 46.8 Mbps. Hong Kong also had an average peak connection speed above 40 Mbps, while Romania, Japan, and Latvia were all above 30 Mbps. The remaining countries in the top 10, as well as the United States, saw average peak connection speeds above 20 Mbps in the third quarter, as did an additional 15 countries around the world. Another 43 countries had average peak connection speeds in excess of 10 Mbps. Guinea-Bissau's 1.7 Mbps average peak connection speed (up from 1.5 Mbps in the prior quarter) once again ranked that country as the slowest among those that qualified for consideration.

	Country	Q3 '11 Peak Mbps	QoQ Change	YoY Change
–	Global	11.7	2.4%	45%
1	South Korea	46.8	31%	19%
2	Hong Kong	46.0	3.8%	28%
3	Romania	34.5	2.5%	15%
4	Japan	32.9	4.3%	7.3%
5	Latvia	32.1	9.0%	39%
6	Belgium	26.9	0.3%	33%
7	Netherlands	25.5	0.8%	40%
8	Switzerland	25.0	4.4%	42%
9	Portugal	25.0	-4.9%	30%
10	Hungary	24.6	1.0%	45%
11	United States	24.1	9.2%	23%

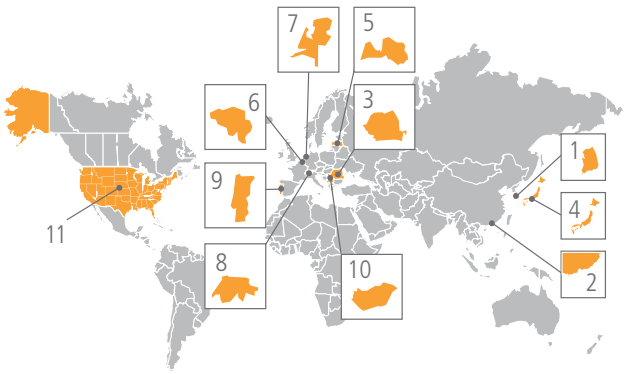


Figure 10: Average Peak Connection Speed by Country

3.4 Global Average Peak Connection Speeds, City View

As we have done in previous editions of the *State of the Internet* report, in examining average peak connection speeds at a city level, we have applied filters for unique IP address count (50,000 or more seen by Akamai in the third quarter of 2011) and academic institutions (removing data from known academic networks). As with the other data sets used in Section 3 of this report, traffic from known mobile networks has been removed as well.

As shown in Figure 11, three of the top 10 cities with the highest average peak connection speeds were in South Korea, including Taejon and Taegu, which topped both this list and the list of the top 100 cities with the highest average connection speeds. Seven cities in Japan rounded out the top 10, and eight of the top 10 cities had average peak connection speeds above 50 Mbps in the third quarter, up from just six in the prior quarter. Anyang, South Korea, and Nagano, Japan fell just shy of 50 Mbps, but join 15 other cities that also had average peak connection speeds above 40 Mbps. Fifty-eight more cities among the top 100 had average peak connection speeds above 30 Mbps, and the remaining 17 cities all had average connection speeds above 20 Mbps.

Cities in the Asia Pacific region remained in the majority among the top 100 in the third quarter, holding 67 spots on the list, including Hong Kong, one in Australia, six in South Korea, and 59 in Japan. Twenty-six cities from North America made the list, all within the United States, with the fastest being North Bergen, NJ, at 26.8 Mbps. The remaining seven cities were from six countries in Europe, with Switzerland contributing two cities. The fastest European city was Timisoara, Romania, which had an average peak connection speed of 41.5 Mbps in the third quarter.

In reviewing the full global list of nearly 900 cities that qualified for inclusion in this section, the fastest cities in other geographies included Tunis, Tunisia (Africa) with an average peak connection speed of 9.0 Mbps, and Munro, Argentina (South America) with an average peak connection speed of 23.7 Mbps.

DID YOU **KNOW?**

- *South Korea has long been one of the most advanced broadband markets in the world and is a world leader in the deployment of FTTx. One of the reasons behind this phenomenon is the fact that South Korea established a robust national broadband development strategy which received widespread political support. The government adopted an initiative known as the Korea Information Infrastructure (KII) Plan aimed at connecting of 84 per cent of South Korean households to broadband services with speeds of up to 1 Mbps by 2005. The next big aim for the Korean government is to launch 1 Gbps broadband services by 2012.*
  [Source: http://point-topic.com/content/operatorSource/profiles2/south-korea-broadband-overview.htm]

- *In Tunisia, competition between eleven ISPs, supported by a nationwide fibre optic backbone network and international access via submarine and terrestrial fibre, has led to one of the most developed Internet markets in the region and some of the lowest broadband prices in Africa.*
  [Source: http://www.budde.com.au/Research/Tunisia-Telecoms-Mobile-and-Broadband.html]

	Country	City	Q3 '11 Peak Mbps
1	South Korea	Taejon	58.8
2	South Korea	Taegu	57.2
3	Japan	Shimotsuma	55.4
4	Japan	Kanagawa	54.5
5	Japan	Yokohama	53.2
6	Japan	Tokai	52.5
7	Japan	Urawa	52.0
8	Japan	Marunouchi	50.9
9	South Korea	Anyang	49.8
10	Japan	Nagano	49.1
11	South Korea	Kimchon	47.3
12	South Korea	Seoul	47.2
13	Japan	Asahi	46.8
14	Japan	Tochigi	46.1
15	South Korea	Suwon	45.8
16	Hong Kong	Hong Kong	45.8
17	Japan	Hodogaya	45.4
18	Japan	Chiba	45.3
19	Japan	Hiroshima	44.1
20	Japan	Soka	42.6
21	Japan	Ibaraki	42.3
22	Japan	Nagoya	41.7
23	Romania	Timisoara	41.5
24	Japan	Shizuoka	40.6
25	Japan	Kokuryo	40.6
26	Japan	Kobe	39.7
27	Japan	Sendai	39.5
28	Japan	Gifu	39.4
29	Japan	Kyoto	39.0
30	Japan	Fukuoka	38.8
31	Japan	Utsunomiya	38.8
32	Japan	Niigata	37.9
33	Japan	Osaka	37.6
34	Japan	Mito	37.2
35	Japan	Yosida	36.9
36	United States	North Bergen, NJ	36.8
37	Japan	Yokkaichi	36.6
38	United States	Monterey Park, CA	36.5
39	United States	San Jose, CA	36.5
40	Japan	Hakodate	36.2
41	Japan	Nara	35.7
42	United States	Kingsport, TN	35.6
43	Japan	Fukui	35.5
44	Japan	Niho	35.4
45	Japan	Otsu	35.1
46	United States	Fayetteville, NC	35.0
47	Japan	Tokushima	34.7
48	United States	Fairfield, CA	34.6
49	Japan	Hamamatsu	34.6
50	Japan	Fukushima	34.5

	Country	City	Q3 '11 Peak Mbps
51	United States	Staten Island, NY	34.4
52	Japan	Wakayama	34.4
53	Japan	Kofu	34.1
54	Japan	Matsuyama	33.7
55	Australia	Canberra	33.6
56	Japan	Sapporo	33.1
57	Japan	Kanazawa	33.1
58	United States	Oakland, CA	32.8
59	Japan	Yamagata	32.7
60	United States	Jersey City, NJ	32.7
61	Japan	Kochi	32.6
62	Japan	Yamaguchi	32.5
63	Japan	Okidate	32.4
64	United States	Spartanburg, SC	32.3
65	United States	Riverside, CA	32.2
66	United States	Fremont, CA	32.1
67	United States	San Mateo, CA	31.9
68	Japan	Okayama	31.8
69	United States	Columbia, MD	31.8
70	United States	Fredericksburg, VA	31.7
71	Romania	Bucharest	31.7
72	United States	Hollywood, FL	31.6
73	Latvia	Riga	31.6
74	Japan	Akita	31.1
75	Japan	Toyonaka	30.8
76	United States	Waco, TX	30.7
77	Czech Republic	Brno	30.6
78	United States	Ogden, UT	30.5
79	United States	Cherry Hill, NJ	30.4
80	United States	Arvada, CO	30.3
81	United States	Santa Barbara, CA	30.3
82	Japan	Kumamoto	30.3
83	United States	Muncie, IN	30.2
84	Japan	Iwaki	29.9
85	United States	Winston-Salem, NC	29.9
86	Japan	Saga	29.8
87	Netherlands	Amsterdam	29.6
88	Sweden	Boras	29.5
89	Japan	Miyazaki	29.5
90	United States	Boston Metro, MA	29.3
91	Japan	Tokyo	29.3
92	Japan	Morioka	29.3
93	Japan	Hyogo	29.2
94	United States	Lancaster, PA	29.1
95	Japan	Aomori	29.1
96	Switzerland	Zurich	29.1
97	Japan	Kagoshima	29.0
98	Japan	Tottori	28.7
99	Japan	Naha	28.6
100	United States	Everett, WA	28.3

Figure 11: Average Peak Connection Speed, Top Global Cities

3.5 Global High Broadband Connectivity

In the third quarter of 2011, the level of global high broadband adoption continued to close in on the 30% mark, growing just over 4% quarter-over-quarter to 29%, as shown in Figure 12. Quarterly growth was also seen in five of the top 10 countries, with South Korea seeing the greatest increase, growing 37% from the prior quarter to 79%. Quarterly declines ranging from 1.2% to 8.0% were seen in the other five countries among the top 10 – as these declines were relatively small, and since the levels of high broadband adoption among these countries are all above 50%, this negative short-term change is not cause for concern. The United States, ranked thirteenth globally, saw a quarter-over-quarter increase of 7.7%, growing to a 45% high broadband adoption rate, remaining above 40% for the second consecutive quarter. Around the world, four countries (Kuwait, Colombia, United Arab Emirates, Saudi Arabia) saw quarter-over-quarter changes in excess of 100%, with all except the UAE remaining under 10%.

On a year-over-year basis, global high broadband adoption was up by 27%, with solid levels of yearly growth seen in eight of the top 10 countries and the United States. In these countries, growth ranged from a respectable 10% increase in South Korea to Switzerland falling just short of doubling year-over-year. Romania's meager 0.2% year-over-year change is not entirely surprising, given their year-over-year drop in average connection speed. Japan's 5.8% decline, unfortunately, continues to be in line with the year-over-year losses that it has seen throughout 2011. However, it is unlikely that the overall quality of connectivity has declined that significantly in Japan over time. While we endeavor to split out mobile traffic from the source data set for this section, this is generally limited to autonomous systems that are dedicated to mobile traffic. It may be the case that a Japanese network provider that mixes mobile and fixed traffic on a single autonomous system is seeing significant growth in mobile traffic (at lower speeds), which would ultimately serve to skew the data presented here. Across the rest of the world, 26 countries saw high broadband rates more than double year-over-year, including nearly 1200% growth in Argentina (though only to 6.1%), 708% in Belarus (to 5.4%), and 576% in Colombia (to 4.1%). Only Sweden and Romania saw yearly growth rates below 10%, and only Taiwan and Japan had lower high broadband adoption rates year-over-year.

Looking at high broadband adoption on a global basis, only the top 10 countries had half or more of their connections to Akamai in the third quarter at speeds grteater than 5 Mbps – this is even with the prior quarter. There were an additional 22 countries (up from 19 in the second quarter) where more than a quarter of connections were at high broadband rates, and 13 more (down from 15 in the second quarter) where at least one in 10 connections was faster than 5 Mbps. China and India remained the only two countries with high broadband adoption of 1% or less – China jumped to 1.0% adoption with a surprising 78% quarterly increase, while India grew a surprising 46% quarter-over-quarter to 0.6% adoption.

	Country	% Above 5 Mbps	QoQ Change	YoY Change
–	Global	29%	4.3%	27%
1	South Korea	79%	37%	10%
2	Netherlands	68%	-1.3%	39%
3	Hong Kong	60%	2.7%	13%
4	Latvia	57%	2.7%	35%
5	Japan	57%	3.0%	-5.8%
6	Belgium	54%	-5.8%	55%
7	Denmark	51%	-1.2%	45%
8	Switzerland	51%	2.8%	98%
9	Romania	51%	-2.9%	0.2%
10	Czech Republic	50%	-8.0%	58%
…				
13	United States	45%	7.7%	34%

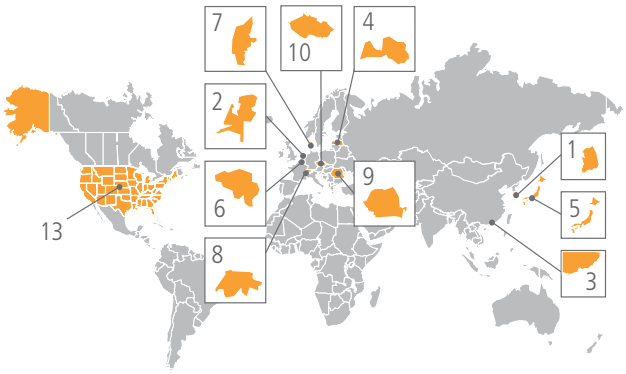


Figure 12: High Broadband Connectivity, Fastest Countries

3.6 Global Broadband Connectivity

In the third quarter of 2011, global broadband adoption saw just a slight amount of growth, increasing 1.6% to reach 66%. As shown in Figure 13, all of the countries among the top 10 once again had more than 90% of their connections to Akamai occurring above 2 Mbps. Consistent with what we have seen in the past, European countries continued to have some of the highest levels of broadband adoption, holding nine of the top 10 spots. The lone entry from the Asia Pacific region, Hong Kong, was number 10 – the next closest Asia Pacific country was Japan, at number 41. Coming in at number 36 globally, the United States grew just under a percent quarter-over-quarter, with 81% broadband adoption in the third quarter.

Among the top 10 countries, quarterly changes in broadband adoption rates were mixed in the third quarter. Aside from South Korea's 17% jump, the increases that were seen were rather minor, at 1% or less in four countries. No change was seen in the Netherlands, and the remaining five countries saw minor declines quarter-over-quarter, the largest being a 2.1% loss in the Isle of Man. Globally, quarterly changes were mixed as well, with 48 qualifying countries seeing growth quarter-over-quarter, and 46 declining. Growth levels were relatively modest, with 30 of the countries growing 10% or less.

On a year-over-year basis, global broadband adoption grew just over 9% -- a rate just slightly less than that seen in the previous quarter. In contrast to the quarter-over-quarter changes, all of the top 10 countries, as well as the United States, saw yearly increases in broadband adoption levels. Among these countries, Hungary had the largest yearly increase, at 11%, while the Isle of Man's was the smallest, at just 0.4%. Globally, the majority of qualifying countries saw higher broadband adoption levels as compared to the third quarter of 2010 – just 12 saw levels decline. Yearly growth rates more than doubled in 20 countries, up from 16 in the second quarter. An additional 34 countries had double-digit percentage increases year-over-year.

In the third quarter of 2011, 18 countries (down from 19 in the second quarter) saw broadband adoption levels of 90% or more. Another 43 (even with the second quarter) had at least half of their connections to Akamai at 2 Mbps or better; 15 additional countries (up from 13 in the second quarter) had broadband adoption of at least 25%, and another 13 countries (up from 8 in the second quarter) had at least one in ten connections to Akamai at speeds of at least 2 Mbps. Of the countries that qualified for inclusion, Venezuela continued to have the lowest level of broadband adoption, at 2.7%, which was up 35% from the second quarter.

	Country	% Above 2 Mbps	QoQ Change	YoY Change
–	Global	66%	1.6%	9.2%
1	Bulgaria	96%	-0.8%	8.1%
2	Switzerland	96%	1.0%	4.6%
3	Romania	95%	0.1%	4.5%
4	Isle Of Man	95%	-2.1%	0.4%
5	Netherlands	95%	–	8.0%
6	Hungary	94%	-0.2%	11%
7	Czech Republic	94%	-1.6%	5.1%
8	South Korea	94%	17%	0.6%
9	Germany	94%	0.1%	6.3%
10	Hong Kong	93%	-0.4%	0.5%
…				
36	United States	81%	0.8%	8.6%

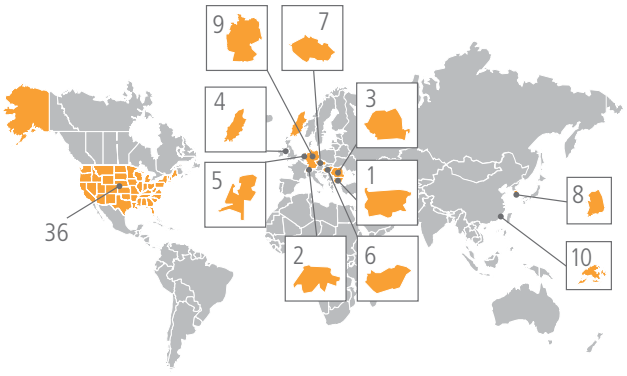


Figure 13: Broadband Connectivity, Fast Countries

3.7 Global Narrowband Connectivity

As shown in Figure 14, the global level of narrowband adoption continued to decline in the third quarter, with only 2.5% of connections to Akamai now occurring at speeds below 256 kbps. (By comparison, it is half as much as it was in the third quarter of 2008.) Eight of the top 10 countries, as well as the United States, saw quarterly declines, ranging from Indonesia's 30% drop to a drop of just 3.6% in Nepal.

Lebanon, which had half of its connections to Akamai at narrowband rates in the third quarter, a level 10% less than in the prior quarter, should continue to see lower narrowband adoption going forward. An August article[4] highlighted that the country's government was set to begin using the India-Middle East-Western Europe (IMEWE) undersea cable, which landed in Tripoli in December 2010. With a multi-terabit capacity, use of the IMEWE cable could remove a bottleneck that has limited the speeds calculated for users in Lebanon in the past.

Libya's 757% quarterly increase clearly stands out here as an outlier, and as was discussed in last quarter's report, we believe that this growth is likely related to government restrictions and limits on Internet connectivity within the country – international connectivity may have been re-established (or expanded) in the third quarter, but in an extremely limited fashion, which could result in connections effectively being limited to narrowband-level speeds. The only other increase seen in the third quarter was in Iran, where Internet censorship is widespread, and where the government has restricted international Internet connectivity in the past. In fact, a May 2011 article in the *Wall Street Journal*[5] noted that "Iran is taking steps toward an aggressive new form of censorship: a so-called national Internet that could, in effect, disconnect Iranian cyberspace from the rest of the world."

From a year-over-year perspective, global narrowband adoption declined by nearly a third, while all of the top 10 countries, along with the United States, also saw healthy yearly declines, by and large indicating a longer-term trend towards higher speed connectivity. Among qualifying countries, only five (Morocco, Vietnam, South Korea, Turkey, and the Ukraine) saw year-over-year growth in narrowband adoption levels. Notable increases were seen in Morocco (800%) and Vietnam (283%). Online references to Internet censorship in Morocco appear to be several years old, and though there were some political protests in February, there were no widespread reports of related Internet outages, as has occurred in other countries within the region. Reports[6] indicate that mobile Internet usage is surging in Vietnam, especially since 3G networks were first "switched on" in early 2010, so artifacts of this usage within the source dataset may be skewing Vietnam's narrowband figures. South Korea's 50% increase year-over-year is also notable, but with narrowband adoption at just 0.3%, it is not of concern, as shifts in the connection speeds of just a few thousand users can be manifested as significant percentage changes.

Of the countries that qualified for inclusion in this section, 14 recorded narrowband adoption levels below the global figure of 2.5% for the third quarter of 2011. Of those, 11 saw narrowband adoption of 1% or less, with France remaining the country with the lowest level, at just a quarter of a percent. National broadband initiatives, including efforts in Ireland,[7] Australia,[8] and Tanzania,[9] continue to work towards making higher-speed Internet connectivity more widely available around the world.

	Country	% Below 256 kbps	QoQ Change	YoY Change
–	Global	2.5%	-12%	-32%
1	Libya	55%	757%	-19%
2	Lebanon	50%	-10%	-26%
3	Nigeria	38%	-5.9%	-36%
4	Nepal	34%	-3.6%	-44%
5	Bolivia	32%	-30%	-49%
6	Iran	31%	6.6%	-27%
7	India	29%	-7.0%	-13%
8	Indonesia	22%	-30%	-26%
9	Syria	18%	-9.1%	-48%
10	Kazakhstan	17%	-9.1%	-38%
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30	United States	1.7%	-8.8%	-35%

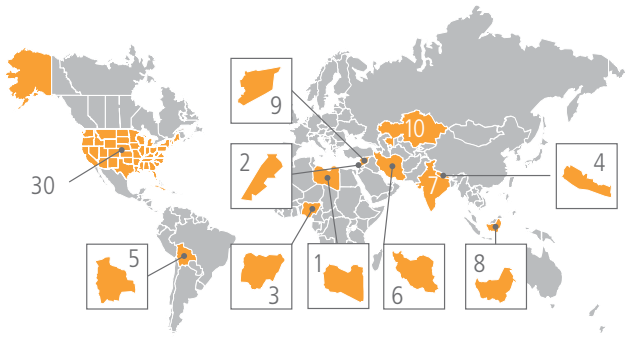


Figure 14: Narrowband Connectivity, Slowest Countries

SECTION 4:
Geography–United States

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.)

4.1 United States Average Connection Speeds

In the third quarter of 2011, Rhode Island maintained its position as the fastest state in the union, with prior leader Delaware staying in second place. (However, it is worth noting that their average connection speeds are separated by less than 40 kbps, so Delaware could easily regain the top spot in the future.) Both states continued to be the only two in the country with average connection speeds above 8 Mbps. Among the balance of the top 10 states, solid quarterly increases were seen in all but the District of Columbia, which had a 3.8% decline quarter-over-quarter. Looking across the whole country, just over 5 Mbps separated Rhode Island and Arkansas, the slowest state, which had an average connection speed of 3.4 Mbps. Quarterly changes were overwhelmingly positive as well, with growth seen in 45 states, ranging from a 17% increase in Vermont (to 7.9 Mbps) to just 0.6% in Mississippi (to 4.1 Mbps).

Looking at year-over-year changes, all of the states across the country saw growth in average connection speeds. Only three states (Maine, Minnesota, Hawaii) saw yearly growth below 10%, while four states (Wyoming, Rhode Island, Connecticut, North Carolina) all grew more than 30% – last quarter, 14 states saw yearly growth above 30%.

According to *Measuring Broadband America: A Report on Consumer Broadband Performance in the US*,[10] issued in August by the United States Federal Communications Commission (FCC), "For most participating broadband providers, actual download speeds are substantially closer to advertised speeds than was found in data from early 2009." The FCC noted, "On average, during peak periods DSL-based services delivered download speeds that were 82 percent of advertised speeds, cable-based services delivered 93 percent of advertised speeds, and fiber-to-the-home services delivered 114 percent of advertised speeds." Though the referenced study took place prior to the third quarter, the published results arguably point to the gap between advertised and actual speeds closing over time.

4.2 United States Average Connection Speeds, City View

As with the Global Average Connection Speeds, City View presented in Section 3.2, connections from known mobile and academic networks were removed from the underlying data set for this metric, and the 50,000 unique IP address filter was used for this view as well.

As shown in Figure 16, San Jose remained at the top of the list in the third quarter, despite its average connection speed dropping slightly from the prior quarter. Plano, Texas saw its average connection speed increase enough to vault it into second place among the top 10 U.S. cities – it had not previously appeared on the list. It appears that quarterly changes among the average connection speeds in the top 10 cities were mixed, as some saw increases large enough to move them up the list,

	State	Q3 '11 Avg. Mbps	QoQ Change	YoY Change
1	Rhode Island	8.6	4.0%	36%
2	Delaware	8.5	5.7%	20%
3	Utah	7.9	13%	24%
4	Vermont	7.9	17%	28%
5	New Hampshire	7.7	17%	28%
6	Connecticut	7.4	15%	36%
7	Massachusetts	7.3	13%	23%
8	District Of Columbia	7.2	-3.8%	12%
9	California	7.1	5.6%	22%
10	Indiana	6.9	7.6%	26%

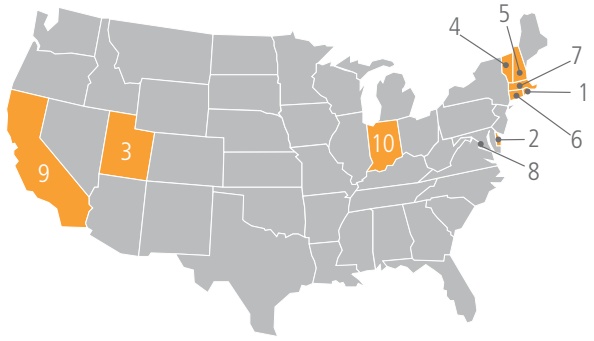


Figure 15: Average Measured Connection Speed by State

	City	Q3 '11 Avg. Mbps
1	San Jose, CA	13.0
2	Plano, TX	8.9
3	Fremont, CA	8.6
4	North Bergen, NJ	8.5
5	Jersey City, NJ	8.2
6	Fredericksburg, VA	8.2
7	Monterey Park, CA	8.1
8	Boston Metro, MA	8.0
9	Staten Island, NY	7.8
10	Fairfield, CA	7.7

Figure 16: Average Measured Connection Speed, Top United States Cities by Speed

or put them on the list, while others stayed on the list but may have fallen a few places. Having said that, the average connection speed of the 10th city on the list increased – in the third quarter of last year, it was 6.5 Mbps (in Staten Island, NY).

California fell back to having fewer than half of the top 10 cities, with only four appearing on the list in the third quarter. Aside from Plano, the remaining cities were all located on the East Coast, in Virginia, Massachusetts, New York, and New Jersey.

4.3 United States Average Peak Connection Speeds

With an aggressive quarter-over-quarter increase, Delaware moved back into position in the third quarter as the state with the highest average peak connection speed, after being displaced last quarter by Rhode Island. As shown in Figure 17, both states remained the only ones with average peak connection speeds above 30 Mbps, while six of the top 10 were clustered in the 27-28 Mbps range.

Among the top 10 states, quarterly changes were all positive, ranging from 3.4% in Rhode Island to 21% in Indiana. Across the whole country, quarterly growth was seen in all states, with 24 growing 10% or more. The largest increase occurred in West Virginia, which jumped 31% from the second quarter (to 24.4 Mbps), while the smallest increase was in the District of Columbia, which only grew 1.7% (to 28.1 Mbps).

From a year-over-year perspective, all of the top 10 states saw average peak connection speeds increase, with North Carolina's 46% growth the greatest of the group. Average peak connection speeds grew in excess of 10% in all of the top 10 states in the third quarter. This was also the case in all but two states around the whole country as well, with Minnesota and Hawaii increasing 2.9% and 2.2% year-over-year respectively to 21.7 Mbps and 25.0 Mbps. In contrast, Alaska, Wyoming, and North Carolina all experienced year-over-year increases in average peak connection speeds of 40% or more.

4.4 United States Average Peak Connection Speeds, City View

San Jose, North Bergen, and Monterey Park were the three U.S. cities with the highest average peak connection speeds in the second quarter. As shown in Figure 18, they remained the top three, though San Jose dropped to third place, losing 2.2 Mbps as compared to the second quarter. Among the other cities in the top 10, it appears that quarterly increases were the norm, including ones big enough to propel Kingsport, Fayetteville, and Spartanburg onto the list.

	State	Q3 '11 Peak Mbps	QoQ Change	YoY Change
1	Delaware	35.9	17%	29%
2	Rhode Island	32.3	3.4%	28%
3	Vermont	29.6	20%	21%
4	District Of Columbia	28.1	1.7%	14%
5	New York	27.9	8.9%	29%
6	Indiana	27.5	21%	29%
7	North Carolina	27.3	13%	46%
8	Massachusetts	27.1	16%	16%
9	Virginia	27.1	6.9%	22%
10	New Hampshire	27.0	12%	14%

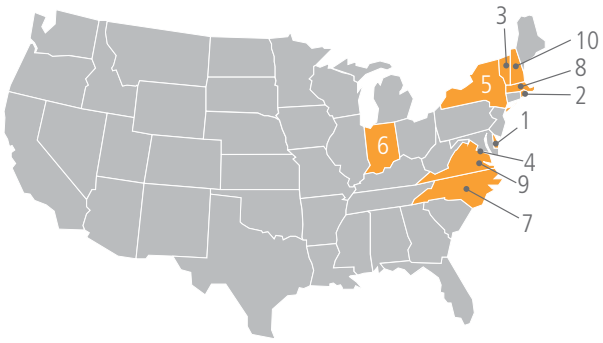


Figure 17: Average Peak Connection Speed by State

Similar to the average connection speed metric, California fell back to having fewer than half of the top 10 cities, with only four appearing on the list in the third quarter. In addition, similar to the other metric, the average peak connection speed of the 10th city on the list increased – in the third quarter of last year, it was 27.2 Mbps (in Fairfield, CA).

4.5 United States High Broadband Connectivity

As shown in Figure 19, eight of the 10 states with the highest levels of high broadband adoption saw solid quarterly growth during the third quarter. First place Delaware grew just over 9%, becoming the first U.S. state to have more than 80% of connections to Akamai at speeds over 5 Mbps. Five other states in the top 10 saw quarter-over-quarter increases of more than 10%, the largest in Connecticut, at 27%. Among this group, only Rhode Island and the District of Columbia experienced quarterly declines, though they were rather minor. Quarterly growth was fairly prevalent across the whole country, with 45 states improving high broadband adoption rates as compared to the first quarter. The biggest change was seen in Iowa, which grew 50% quarter-over-quarter to have a quarter of connections to Akamai from the state at high broadband levels. Just five states and the District of Columbia saw high broadband adoption levels drop quarter-over-quarter, with the largest declines seen in Hawaii and Maine, which declined 17% and 14% respectively. Arkansas remained the state with the lowest level of high broadband adoption, though it grew 10% quarter-over-quarter to 11% adoption.

Comparing high broadband adoption levels in the top 10 states to the third quarter of 2010, all of the listed states saw very strong growth year-over, with the District of Columbia's still solid 18% increase the only one listed below 25%. Growth

	City	Q3 '11 Peak Mbps
1	North Bergen, NJ	36.8
2	Monterey Park, CA	36.5
3	San Jose, CA	36.5
4	Kingsport, TN	35.6
5	Fayetteville, NC	35.0
6	Fairfield, CA	34.6
7	Staten Island, NY	34.4
8	Oakland, CA	32.8
9	Jersey City, NJ	32.7
10	Spartanburg, SC	32.3

Figure 18: Average Peak Connection Speed, Top United States Cities by Speed

was extremely strong across the whole country as well, with only Idaho and Maine experiencing yearly growth of less than 10% (8.5% and 3.5% respectively), and only Hawaii seeing a decline (of 5.5%) year-over-year. Iowa was also the state with the largest yearly change, growing 94%. After recording 112% yearly growth in the second quarter, New Mexico's pace slowed significantly, posting a 32% year-over-year change in the third quarter.

4.6 United States Broadband Connectivity

Delaware remained the state with the highest level of broadband adoption, holding steady at 98%, as shown in Figure 20. Among the top 10 states, the quarterly change was mixed, and the growth that was seen was not particularly strong. Both Delaware and Hawaii only saw broadband adoption rates increase by a tenth of a percent quarter-over-quarter, while the largest growth among the top 10 was seen in New Jersey, with an increase of just 2.7%. Similar results were seen across the whole country, with mixed quarterly changes in broadband

	State	% Above 5 Mbps	QoQ Change	YoY Change
1	Delaware	81%	9.3%	25%
2	Rhode Island	73%	-0.9%	42%
3	New Hampshire	72%	13%	33%
4	New Jersey	61%	11%	37%
5	Vermont	61%	19%	51%
6	Maryland	57%	6.2%	32%
7	Massachusetts	57%	15%	27%
8	District Of Columbia	55%	-1.5%	18%
9	New York	55%	2.5%	34%
10	Connecticut	55%	27%	40%

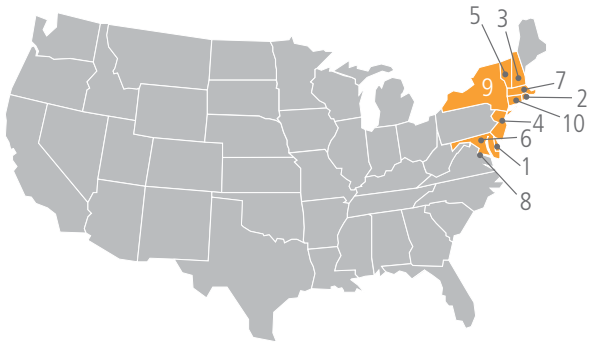


Figure 19: High Broadband Connectivity, Fastest U.S. States

adoption levels, and fairly limited growth. Only Iowa (17% increase) and Missouri (13% increase) grew more than 10%, with the next highest increase seen in Illinois, at 5.6%. Sixteen states saw broadband adoption levels decline quarter-over-quarter, though the declines were fairly minor, with Wyoming's 2.1% loss the largest.

Looking at year-over-year changes, all of the states among the top 10 saw broadband adoption levels increase as compared to the third quarter of 2010, with growth ranging from just 0.8% in first-place Delaware to 8.9% in Vermont. Yearly changes were positive across the whole country, with no declines seen year over-year in broadband adoption. Iowa's 42% year-over-year growth (to 65%) led the country; Delaware's meager increase was the lowest seen. Overall, 23 states saw growth rates of 10% or more year-over-year. The long-term trends observed in the growth of broadband adoption are fairly similar to those observed in the second quarter and appear to point to consistent levels of improvement in last mile connectivity and greater availability (and consumption) of high-speed Internet connections.

	State	% Above 2 Mbps	QoQ Change	YoY Change
1	Delaware	98%	0.1%	0.8%
2	New Hampshire	94%	-0.5%	2.6%
3	Rhode Island	93%	-0.4%	2.1%
4	Hawaii	93%	0.1%	3.7%
5	Connecticut	90%	0.6%	6.8%
6	Vermont	87%	-1.5%	8.9%
7	Nevada	87%	0.9%	2.9%
8	Maine	86%	0.2%	3.7%
9	New Jersey	85%	2.7%	6.5%
10	Florida	85%	-	7.7%

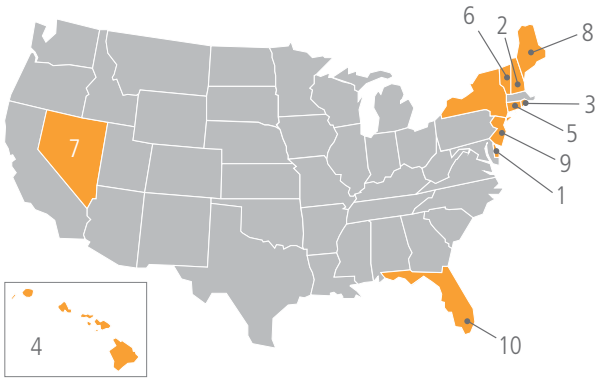


Figure 20: Broadband Connectivity, Fast U.S. States

DID YOU KNOW?

- *A recent FCC survey found that 80 percent of consumers did not know what speed they purchased from their Internet Service Provider (ISP).* *[Source: http://www.fcc.gov/measuring-broadband-america]*
- *Even during peak usage periods--between 7:00 pm and 11:00 pm on weeknights, when more home users are online and service quality declines--most major broadband providers deliver actual speeds that are 80% of advertised speeds or better.*
  [Source: http://www.fcc.gov/document/fcc-unveils-new-research-measuring-broadband-performance]
- *The National Telecommunications and Information Administration (NTIA) has made a National Broadband Map available at http://www.broadbandmap.gov. The National Broadband Map is a tool to search, analyze and map broadband availability across the United States.*

4.7 United States Narrowband Connectivity

While Arkansas was the only state among the prior quarter's top 10 to see an increase in narrowband adoption, Figure 21 shows that Arkansas is no longer in the top 10, and that both Missouri and Illinois were the only two states of the group to see quarter-over-quarter increases in the percentage of connections to Akamai at speeds below 256 kbps; these increases are on top of solid quarterly declines in the second quarter. Among the remaining states in the top 10, quarterly declines continued to indicate an ongoing shift to higher-speed connectivity. The District of Columbia continued to have the highest level of narrowband adoption, remaining below 5%. Across the whole country, 45 states and the District of Columbia saw narrowband adoption levels decline quarter-over-quarter, from a 0.9% decrease in Louisiana to a 42% decline in Arkansas (following last quarter's 47% increase). Among the states that saw narrowband adoption levels grow from the second quarter, Wyoming and Missouri both saw unusually large, and unexplained, increases (27% and 10% respectively), while Illinois, Delaware, and Alabama all grew less than 10%. (However, with only a few hundred unique IP addresses from Delaware connecting to Akamai at speeds below 256 kbps, and a narrowband adoption rate of just 0.1%, lower connection speeds among just a very small number of IP addresses can translate into larger percentage changes.)

Looking across the whole country, the long-term trend also clearly supports a continuing move to higher speed connections, with Virginia once again the only state experiencing a year-over-year increase, minor as it may be, at 1.7%. (As noted previously, however, this change may be due to shifts in underlying IP geolocation data.) Otherwise, year-over-year declines remained fairly strong, ranging from a loss of 9.2% in South Dakota (to 1.0%) to a loss of 74% in Nebraska (to 0.7%).

Ongoing efforts to further the goals of the FCC's National Broadband Plan continued during the third quarter, especially around bringing improved broadband connectivity to rural areas – this should help to drive further long-term declines in narrowband adoption around the country. In August, $103 million in federal funding was awarded to telecommunications companies in 16 states to help expand broadband Internet access to those in rural areas.[11] At the same time, six of the nation's leading broadband providers submitted a proposal to the FCC to speed broadband deployment to more than 4 million Americans living in rural areas.[12] However, these efforts and initiatives are not without controversy. The National Association of Broadcasters noted[13] that, as part of wireless spectrum recapture efforts related to the FCC's National Broadband Plan, 73 television stations in the largest 10 markets would be forced off the air, and that service disruptions would occur at more than 800 TV stations in large markets, mid-sized markets and small markets, especially in cities along the Canadian border. Rural telecommunications service providers have also raised objections, due to a planned shift of Universal Service Fund money and lower requirements for connection speeds than some of these providers had been targeting.[14]

	State	% below 256 kbps	QoQ Change	YoY Change
1	District Of Columbia	4.6%	-1.7%	-24%
2	Missouri	4.2%	10%	-24%
3	Alaska	3.1%	-19%	-42%
4	Georgia	3.0%	-2.2%	-32%
5	Illinois	2.9%	6.1%	-25%
6	Iowa	2.7%	-27%	-44%
7	Colorado	2.5%	-11%	-32%
8	Ohio	2.4%	-12%	-37%
9	Texas	2.3%	-7.0%	-34%
10	Washington	2.3%	-8.6%	-30%

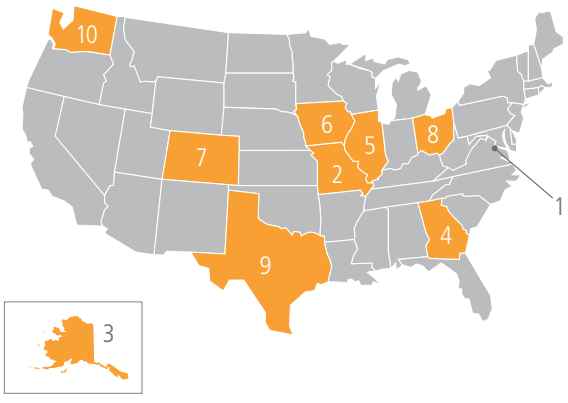


Figure 21: Narrowband Connectivity, Slowest U.S. States

SECTION 5:

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.)

5.1 Asia Pacific Average Connection Speeds

In the third quarter of 2011, the top three countries in the Asia Pacific region remained South Korea, Hong Kong, and Japan. As shown in Figure 22, South Korea was far and away the fastest country, with an average connection speed of 16.7 Mbps, with Hong Kong at 10.5 Mbps and Japan at 8.9 Mbps. The remaining countries surveyed within the region fell far below the top three countries, with several clustered in the 3-5 Mbps range, and others clustered in the 0-2 Mbps range. While South Korea saw an impressive 17% quarter-over-quarter change, it was not the largest observed in the region – China beat it with 21% quarterly growth. Perennial stalwart India also saw solid quarterly growth, increasing 12%, but was still unable to break the 1 Mbps average connection speed threshold. Aside from these three countries, five others (Hong Kong, Japan, New Zealand, Australia, and Thailand) also saw quarter-over-quarter growth, though it was more limited. Four countries within the region (Singapore, Taiwan, Malaysia, and the Philippines) saw average connection speeds decline slightly during the quarter.

Strong yearly growth, in excess of 10%, in average connection speeds was seen in all but two of the countries in the region. Japan's year-over-year growth, while respectable at 5.8%, was not as significant as that seen in other countries. Taiwan experienced the only decline seen in the region, dropping nearly 20% as compared to the third quarter of 2010. It is not clear what caused the decline seen in Taiwan, especially as the country's largest telecommunications service provider announced plans in July to improve Taiwan's telecom infrastructure to support connection speeds of 100 Mbps – 1 Gbps by 2015.[15]

The third quarter of 2011 once again saw three countries within the Asia Pacific region with average connection speeds that exceeded the "high broadband" (5 Mbps) threshold, and an additional five had average connection speeds that exceeded the "broadband" (2 Mbps) threshold. As noted above, India remains the only surveyed country within the region that has an average connection speed below 1 Mbps.

Global Rank	Country	Q3 '11 Avg. Mbps	QoQ Change	YoY Change
1	South Korea	16.7	17%	18%
2	Hong Kong	10.5	2.0%	14%
3	Japan	8.9	0.3%	5.8%
33	Singapore	4.5	-1.6%	34%
38	Taiwan	4.1	-2.0%	-19%
41	New Zealand	4.0	4.0%	24%
45	Australia	3.6	1.5%	24%
47	Thailand	3.4	8.3%	23%
75	Malaysia	1.9	-1.4%	38%
90	China	1.4	21%	43%
101	Philippines	1.1	-4.7%	13%
110	India	0.9	12%	12%

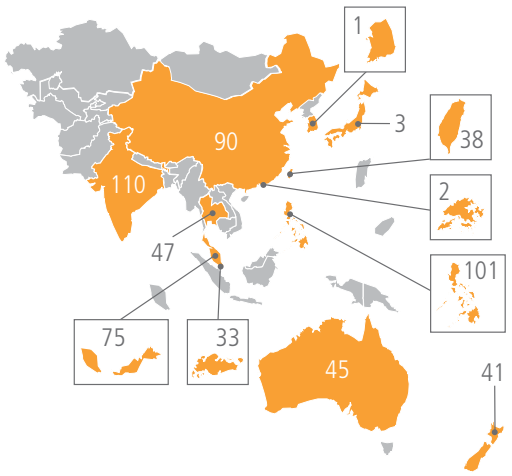


Figure 22: Average Measured Connection Speed by Asia Pacific Country

5.2 Asia Pacific Average Connection Speeds, City View

As with the Global Average Connection Speeds, City View presented in Section 3.2, connections from known academic and mobile networks were removed from the underlying data set for this metric, and the 50,000 unique IP address feature was used as well.

In reviewing the top 10 cities in the Asia Pacific region with the highest average connection speeds, as shown in Figure 23, we see that cities in South Korea remained at the top of the list, holding the top five slots, as well as one more within the top 10. The average connection speeds within most of these cities grew quarter-over-quarter – some like Taegu and Taejon saw significant multi-Mbps increases, while others, such as Tokai or Urawa, saw speeds increase by just 0.1–0.2 Mbps.

From a global perspective, the majority of the fastest cities were in the Asia Pacific region, with the top 100 list including 57 in Japan, six in South Korea, one in Australia, and Hong Kong.

	City	Q3 '11 Avg. Mbps
1	Taegu, South Korea	21.5
2	Taejon, South Korea	20.1
3	Anyang, South Korea	18.2
4	Kimchon, South Korea	18.0
5	Seoul, South Korea	16.9
6	Shimotsuma, Japan	15.5
7	Kanagawa, Japan	14.5
8	Suwon, South Korea	14.4
9	Tokai, Japan	14.3
10	Urawa, Japan	14.1

Figure 23: Average Measured Connection Speed, Top Asia Pacific Cities by Speed

5.3 Asia Pacific Average Peak Connection Speeds

With a massive 31% quarterly increase in average peak connection speed, South Korea pushed Hong Kong out of the first place slot in the third quarter, returning to a position it last held in the third quarter of 2010. Figure 24 shows that average peak connection speeds of 46 Mbps or more in South Korea and Hong Kong were nearly 50% higher than the next fasest country in the region, Japan. A gap of just over 10 Mbps separates Japan and Taiwan, illustrating the large differences in average peak connection speeds among top countries in the Asia Pacific region.

In the third quarter, all of the surveyed countries in the region except for one saw positive quarter-over-quarter changes in average peak connection speeds. The lone outlier was the Philippines, which saw a decline of just 0.2%. Among countries that saw quarterly increases, South Korea, Taiwan, New Zealand, Malaysia, and China all grew in excess of 10%. The lowest level of quarterly growth in the region was seen in Hong Kong, which posted a 3.8% increase.

In looking at year-over-year changes, Japan was the only country in the region that grew less than 10%, though its 7.3% increase was still meaningful. Malaysia had the largest year-over-year increase, at 52%, while Thailand and China were close behind, both with yearly growth of 49%. Within the region, only the Philippines, India, and China recorded average peak connection speeds below 10 Mbps.

Global Rank	Country	Q3 '11 Peak Mbps	QoQ Change	YoY Change
1	South Korea	46.8	31%	19%
2	Hong Kong	46.0	3.8%	28%
4	Japan	32.9	4.3%	7.3%
15	Taiwan	22.5	11%	28%
20	Singapore	21.8	5.3%	31%
35	Thailand	18.0	7.3%	49%
41	New Zealand	16.7	11%	24%
42	Australia	16.2	6.4%	34%
56	Malaysia	12.8	11%	52%
87	Philippines	8.3	-0.2%	12%
110	India	5.8	4.0%	13%
116	China	5.5	20%	49%

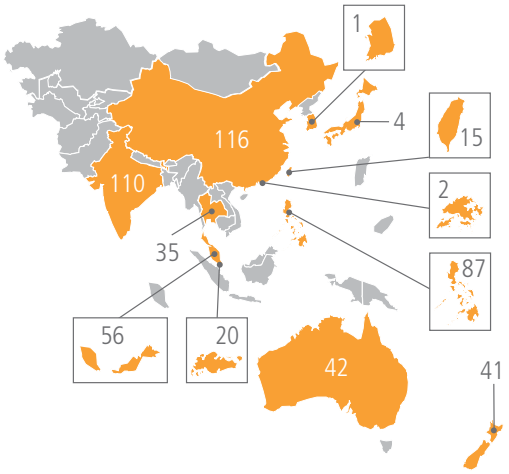


Figure 24: Average Peak Connection Speed by Asia Pacific Country

5.4 Asia Pacific Average Peak Connection Speeds, City View

In contrast to the city view of average connection speeds, Figure 25 shows that only three cities from South Korea are among the top 10 cities in the Asia Pacific region for average peak connection speeds. Similar to the prior metric, Taejon and Taegu hold the top two slots, though they have reversed position here. Quarterly changes within the listed cities were mixed, with cities like Taejon and Taegu seeing multi-Mbps growth, while Marunouchi and Nagano saw peak connection speeds slow by less than 1 Mbps. This quarter, eight cities recorded average peak connection speeds above 50 Mbps, with Anyang and Nagano just slightly below it. With even nominal levels of growth going forward, we should see all of the top 10 cities have average peak connection speeds in excess of 50 Mbps.

	City	Q3 '11 Peak Mbps
1	Taejon, South Korea	58.8
2	Taegu, South Korea	57.2
3	Shimotsuma, Japan	55.4
4	Kanagawa, Japan	54.5
5	Yokohama, Japan	53.2
6	Tokai, Japan	52.5
7	Urawa, Japan	52.0
8	Marunouchi, Japan	50.9
9	Anyang, South Korea	49.8
10	Nagano, Japan	49.1

Figure 25: Average Peak Connection Speed, Top Asia Pacific Cities by Speed

5.5 Asia Pacific High Broadband Connectivity

In the third quarter of 2011, 10 of the twelve Asia Pacific countries surveyed saw higher levels of high broadband adoption than in the second quarter, as shown in Figure 26. Only Singapore and Australia saw their percentage of connections to Akamai at speeds above 5 Mbps decline quarter-over-quarter, dropping 7.2% and 2.7% respectively. Of the 10 countries that saw increases, only Hong Kong and Japan increased less than 10%, with the other eight countries seeing very strong quarterly increases, led by a 78% jump in China.

On a year-over-year basis, 10 of the twelve Asia Pacific countries surveyed saw higher levels of high broadband adoption than in the third quarter of 2010. Only Japan and Taiwan saw yearly declines, relatively minor at 5.8% and 0.4% respectively.

Exceptionally strong yearly growth in high broadband adoption was seen in New Zealand, Thailand, Malaysia, and China, all of which saw adoption levels more than double year-over-year. South Korea, Hong Kong, Singapore, Australia, India, and the Philippines all saw solid yearly growth, with high broadband adoption levels increasing 10% or more. Even with strong quarterly and yearly advances, India's high broadband adoption remains below 1%.

(Note that once again, the Philippines is included in the list for the sake of completeness, but is not ranked, as it did not have the requisite 25,000 unique IP addresses for this metric.)

Global Rank	Country	% Above 5 Mbps	QoQ Change	YoY Change
1	South Korea	79%	37%	10%
3	Hong Kong	60%	2.7%	13%
5	Japan	57%	3.0%	-5.8%
24	Singapore	31%	-7.2%	67%
31	Taiwan	28%	11%	-0.4%
35	New Zealand	23%	23%	139%
40	Australia	18%	-2.7%	56%
45	Thailand	11%	61%	285%
53	Malaysia	4.6%	23%	248%
61	China	1.0%	78%	184%
62	India	0.6%	46%	21%
–	Philippines	0.6%	15%	79%

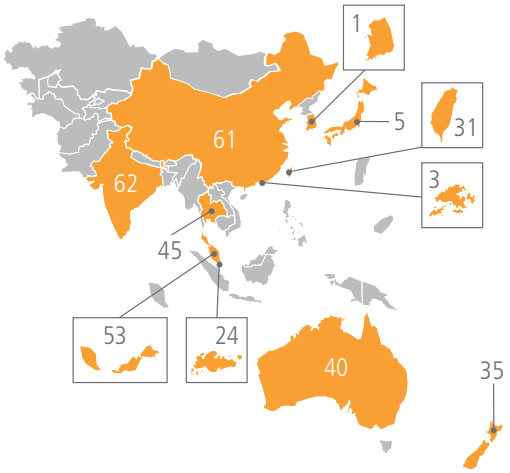


Figure 26: High Broadband Connectivity, Fastest Asia Pacific Countries

5.6 Asia Pacific Broadband Connectivity

Figure 27 illustrates the extremely wide gap in broadband connectivity among surveyed countries in the Asia Pacific region, with an order of magnitude difference between South Korea, having 94% of connection to Akamai at speeds above 2 Mbps, and the Philippines, with just 9.3% of connections at those speeds. There does not appear to be any significant clustering, aside from four countries with adoption rates in the 70% range.

In the third quarter, only five of the dozen countries in the region saw a quarterly increase in broadband adoption levels. China and India had the largest percentage increases, and India finally achieved a 10% broadband adoption rate, which China had achieved in the second quarter. South Korea and Taiwan also had double-digit percentage increases, while Japan grew just 2.7%. The observed quarterly declines were relatively minor, with New Zealand losing the most (8.4%), while four countries lost 1% or less.

Japan once again saw a year-over-year decline in broadband adoption, losing 6%, joining New Zealand and Taiwan, which experienced quarterly declines as well. Among countries that increased broadband adoption levels as compared to the third quarter of 2010, South Korea and Hong Kong grew the least, with year-over-year changes under 1%. In contrast, both Malaysia and China more than doubled their broadband adoption levels over the last year, and India turned in an extremely impressive 89% increase.

DID YOU KNOW?

- *Ovum predicts that FTTH and FTTB wireline broadband subscribers in the Asia Pacific region will exceed 285 million in 2014 with a compounded annual growth rate (CAGR) of 26% over four years, compared to 0% for DSL and 5% for cable modem for the same period.*

  [Source: http://www.computerworld.com.au/article/393055/ftth_fttb_set_overtake_dsl_connections_apac_by_2014_ovum/]

- *While Asia Pacific leads the world in FTTx subscribers, household penetration rates vary widely, from less than 0.01% in Bangladesh to 53% in South Korea.*

  [Source: http://www.telecomasia.net/content/ftth-apac-adjust-your-expectations]

Global Rank	Country	% Above 2 Mbps	QoQ Change	YoY Change
8	South Korea	94%	17%	0.6%
10	Hong Kong	93%	-0.4%	0.5%
41	Japan	78%	2.7%	-6.0%
46	Thailand	73%	12%	16%
47	Taiwan	73%	-1.0%	-4.3%
48	New Zealand	72%	-8.4%	-2.5%
56	Singapore	63%	-5.6%	7.4%
61	Australia	55%	-0.9%	6.6%
79	Malaysia	21%	-4.5%	145%
83	China	18%	53%	135%
89	India	10%	45%	89%
90	Philippines	9.3%	-0.8%	32%

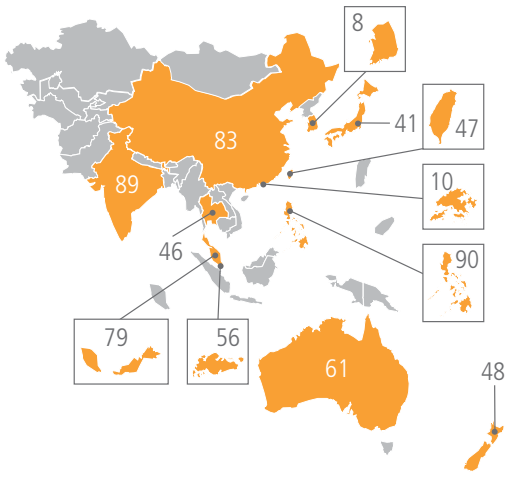


Figure 27: Broadband Connectivity, Fast Asia Pacific Countries

5.7 Asia Pacific Narrowband Connectivity

In reviewing Figure 28, we see that, with the exception of India, narrowband adoption among surveyed countries in the Asia Pacific region remains below 10%. While both short- and long-term trends in India point to improving connectivity, efforts to bring high-speed connectivity to larger portions of the population still have a long way to go before narrowband levels are in line with other countries within the region.

Looking at quarterly changes, we see that most countries in the region continued to experience declines in narrowband adoption levels, ranging from losses of more than 50% in Taiwan and Singapore (both with just 0.2% narrowband adoption), to a loss of 4.3% in Hong Kong (which also had just 0.2% narrowband adoption). The Philippines grew narrowband adoption by 7.8% in the third quarter, which is not necessarily unexpected, given their quarterly decline in broadband adoption. An unusually large quarterly increase was seen in Thailand, which grew narrowband adoption by 51%. However, this may be due to the massive and widespread flooding that occurred in the country during the third quarter – while most news coverage of the flooding highlighted the impact to hard drive and PC manufacturing facilities, it is also likely that the country's telecommunications infrastructure was impacted, leading to an increased percentage of connections at slower speeds.

Year-over-year changes, for the most part, were as expected, with nearly all of the surveyed countries seeing significant declines in narrowband adoption, ranging from a welcome 13% loss in India, to Singapore dropping 95%. The only country in the region that saw growth in narrowband adoption year-over-year was South Korea, which increased by 50% over the last year. However, it's also worth noting that the country's narrowband adoption rate is a scant 0.3%, and with just over 61,000 unique IP addresses connecting to Akamai at speeds below 256 kbps, it is clear that South Korea's position as a global broadband leader is not at risk.

(Note that once again this quarter, Malaysia, Taiwan, Hong Kong, and Singapore are included in the list for the sake of completeness, but are not ranked, as the countries did not have the requisite 25,000 unique IP addresses for this metric.)

Global Rank	Country	% Below 256 kbps	QoQ Change	YoY Change
7	India	29%	-7.0%	-13%
23	New Zealand	3.3%	-18%	-38%
24	China	3.3%	-44%	-57%
26	Philippines	2.7%	7.8%	-46%
27	Thailand	2.7%	51%	-43%
29	Australia	1.8%	-17%	-55%
33	Japan	0.9%	-6.8%	-31%
41	South Korea	0.3%	-39%	50%
–	Malaysia	1.7%	-23%	-69%
–	Taiwan	0.2%	-52%	-69%
–	Hong Kong	0.2%	-4.3%	-55%
–	Singapore	0.2%	-54%	-95%

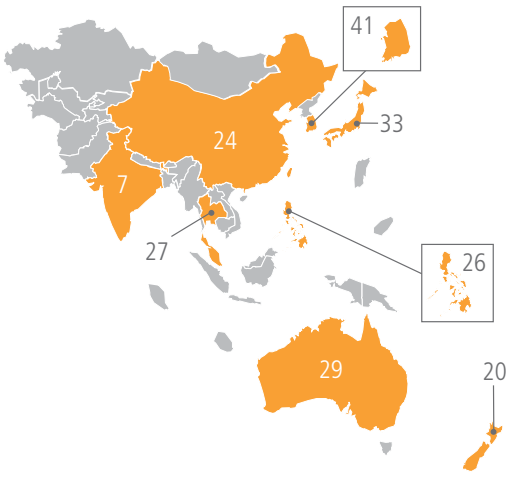


Figure 28: Narrowband Connectivity, Slowest Asia Pacific Countries

SECTION 6:

Geography – Europe

The metrics presented here for Europe 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 Europe, based on classification by Akamai's EdgeScape geolocation tool.) In addition, for the purposes of this report, we are including the United Arab Emirates among the selected countries within Europe.

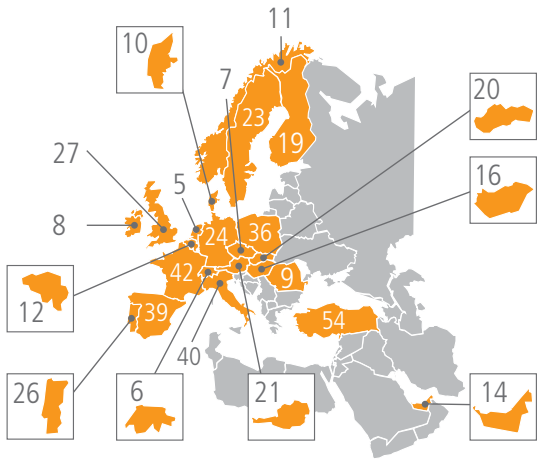
6.1 Europe Average Connection Speeds

In the third quarter, the Netherlands remained the European country with the highest average connection speed, holding steady at 8.5 Mbps. As Figure 29 shows, quarter-over-quarter changes were mixed, with 10 countries increasing average connection speeds, and 12 countries seeing declines. Quarterly growth ranged from just 0.8% in Slovakia to a massive 86% in the United Arab Emirates. However, the UAE's growth may be skewed higher by changes that we believe have been made to the country's network infrastructure. By and large, the losses seen were fairly limited, ranging from a 0.4% decline in Poland to a 4.9% decline in Portugal.

With the exception of a 5.5% decline in Romania, year-over-year trends among the surveyed European countries were all positive. The smallest increase was seen in Sweden, at 7.2%, reversing a 0.1% yearly loss observed in the second quarter. Three countries grew in excess of 50% year-over-year, three more grew more than 40%, an additional five increased average connection speeds by more than 30%, and eight additional countries saw speeds increase by more than 20%.

In the third quarter, seventeen of the listed countries had average connection speeds that exceeded the "high broadband" (5 Mbps) threshold, while the remaining five had average connection speeds that exceeded the "broadband" (2 Mbps) threshold.

Late in the third quarter, the European Commission announced[17] that it would be working with broadband testing firm SamKnows to help develop what it hopes will be a true measure of broadband speeds within the region. Soliciting 10,000 volunteers from 30 European countries, speed and performance tests will be run when a broadband connection isn't otherwise in use, and the results will ultimately be used to develop a map displaying the strongest and weakest spots for broadband across Europe.



Global Rank	Country	Q3 '11 Avg. Mbps	QoQ Change	YoY Change
5	Netherlands	8.5	-0.6%	34%
6	Switzerland	7.5	3.0%	40%
7	Czech Republic	7.3	-1.7%	33%
8	Ireland	7.0	15%	57%
9	Romania	6.6	-2.6%	-5.5%
10	Denmark	6.3	-1.2%	25%
11	Norway	6.2	-1.1%	26%
12	Belgium	6.2	-3.5%	28%
14	United Arab Emirates	6.0	86%	151%
16	Hungary	5.9	2.3%	37%
19	Finland	5.7	-0.6%	29%
20	Slovakia	5.5	0.8%	38%
21	Austria	5.4	1.9%	47%
23	Sweden	5.3	1.3%	7.2%
24	Germany	5.3	-0.5%	24%
26	Portugal	5.1	-4.9%	29%
27	United Kingdom	5.1	1.3%	26%
36	Poland	4.3	-0.4%	38%
39	Spain	4.0	1.9%	45%
40	Italy	4.0	-4.8%	22%
42	France	3.8	-2.2%	15%
54	Turkey	2.9	8.0%	57%

Figure 29: Average Measured Connection Speed by European Country

6.2 Europe Average Connection Speeds, City View

As with the Global Average Connection Speeds, City View presented in Section 3.2, connections from known academic and mobile networks were removed from the underlying data set for this metric, and the 50,000 unique IP address feature was used as well.

In reviewing the top 10 cities in Europe with the highest average connection speeds, shown in Figure 30, we see that Amsterdam tops the list at 9.5 Mbps, improving by 1.4 Mbps from the second quarter. No other city had an average connection speed above 9 Mbps, with Riga the closest at 8.7 Mbps. Former top city Brno saw a speed decline of 0.4 Mbps, dropping it to sixth place, and placing it among seven cities that saw average connection speeds between 7-8 Mbps. The list of the 10 fastest cities in Europe included a number of new ones that did not appear in the second quarter, including Dublin, Kyyiv, Ceska, and Valencia – these cities saw big enough increases in average connection speeds to push Constanta, Liege, Salzburg, and Porto off the list.

	City	Q3 '11 Avg. Mbps
1	Amsterdam, Netherlands	9.5
2	Riga, Latvia	8.7
3	Geneva, Switzerland	8.3
4	Zurich, Switzerland	7.9
5	Dublin, Ireland	7.9
6	Brno, Czech Republic	7.9
7	Kyyiv, Ukraine	7.7
8	Ceska, Czech Republic	7.5
9	Valencia, Spain	7.3
10	Timisoara, Romania	7.2

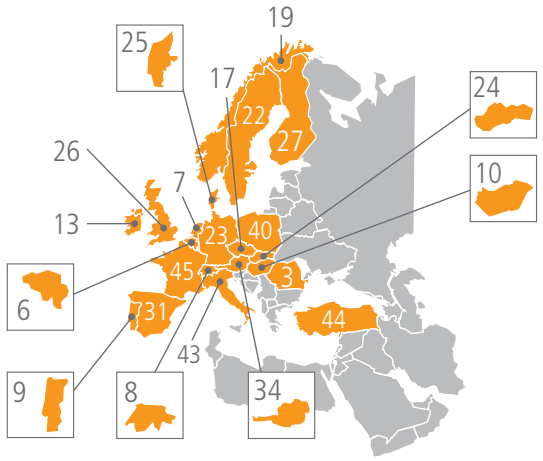
Figure 30: Average Measured Connection Speed, Top European Cities by Speed

6.3 Europe Average Peak Connection Speeds

As shown in Figure 31, average peak connection speeds across the listed European countries all remained above 15 Mbps, with the highest (34.5 Mbps) again seen in Romania. Romania also remained the only country in the region with an average peak connection speed in excess of 30 Mbps. (Observant readers will note that the United Arab Emirates is not listed in Figure 31 – it was removed due to obvious anomalies in the data likely related to the suspected changes in network architecture discussed in Section 6.1). The largest clustering was seen between 20-30 Mbps, with 13 countries falling within that range.

Short-term trends were generally positive, with 15 countries recording increased average peak connection speeds quarter-over-quarter. Speed growth ranged from an improvement of just 0.3% in Belgium to the impressive 18% increase posted by Ireland. Only six countries saw average peak connection speeds decline quarter-over-quarter, and the losses were fairly minor, ranging from a 0.4% drop in Denmark to a 4.9% drop in Portugal.

Overall, long-term trends for average peak connection speed growth point to a continued improvement in high-speed Internet connectivity within these European countries.



Global Rank	Country	Q3 '11 Peak Mbps	QoQ Change	YoY Change
3	Romania	34.5	2.5%	15%
6	Belgium	26.9	0.3%	33%
7	Netherlands	25.5	0.8%	40%
8	Switzerland	25.0	4.4%	42%
9	Portugal	25.0	-4.9%	30%
10	Hungary	24.6	1.0%	45%
13	Ireland	23.4	18%	63%
17	Czech Republic	22.2	-1.7%	36%
19	Norway	22.2	4.3%	37%
22	Sweden	20.8	4.3%	9.6%
23	Germany	20.6	2.4%	31%
24	Slovakia	20.2	-1.1%	24%
25	Denmark	20.2	-0.4%	32%
26	United Kingdom	20.0	5.5%	35%
27	Finland	19.8	2.8%	37%
31	Spain	18.9	1.6%	60%
34	Austria	18.3	-1.4%	42%
40	Poland	16.8	2.3%	61%
43	Italy	16.2	-2.5%	26%
44	Turkey	16.1	6.9%	71%
45	France	15.8	1.5%	24%

Figure 31: Average Peak Connection Speed by European Country

6.4 Europe Average Peak Connection Speeds, City View

Perennial leader Constanta, Romania disappeared from the list of the top 10 European cities with the highest average peak connection speeds in the third quarter – country-mate Timisoara moved into the top spot with an average peak connection speed of 41.5 Mbps, an increase of 2.7 Mbps, making it the only European city to exceed 40 Mbps. As Figure 32 illustrates, a nearly 10 Mbps gap separated Timisoara and second place Bucharest, Romania, highlighting the differences in connectivity within just a single country. The gap was much smaller among the remaining countries, at just over 4 Mbps. Though a newcomer to this list, Spain charted two cities – Valencia and Oviedo.

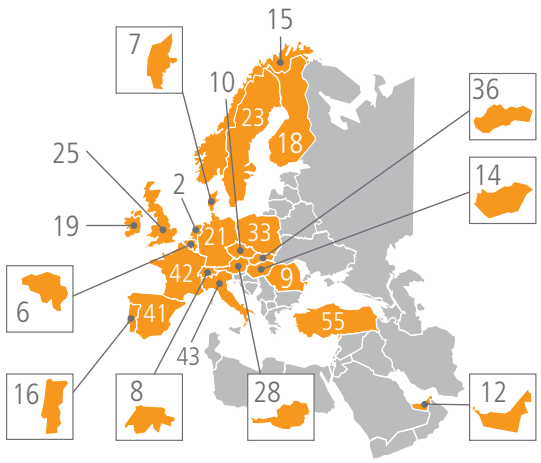
Southhampton was the only city from England to appear in the top 10 list, but it may have serious competition going forward, with the launch of Hyperoptic, a new ISP, during the third quarter of 2011, offering 1 Gbps connectivity for some properties in London.[18] However, the company has noted that, at first, only communal installations in multi-dwelling buildings will be possible. If this offering is commercially successful, over time it will help drive up London's average peak connection speed, and it will also likely drive local competitors, such as BT and Virgin, to make higher speed connectivity available to their subscribers.

	City	Q3 '11 Peak Mbps
1	Timisoara, Romania	41.5
2	Bucharest, Romania	31.7
3	Riga, Latvia	31.6
4	Brno, Czech Republic	30.6
5	Amsterdam, Netherlands	29.6
6	Boras, Sweden	29.5
7	Zurich, Switzerland	29.1
8	Valencia, Spain	28.2
9	Oviedo, Spain	27.6
10	Southampton, England	27.4

Figure 32: Average Peak Connection Speed, Top European Cities by Speed

6.5 Europe High Broadband Connectivity

In the third quarter of 2011, six countries in Europe had more than half of their connections to Akamai at speeds of 5 Mbps or above. As shown in Figure 33, strong high broadband adoption is prevalent throughout Europe, with just four countries seeing adoption rates below 20%, and only Turkey having less than 10% high broadband adoption, though it grew 27% quarter-over-quarter to 3.7%. This lackluster level of high broadband adoption, however, does not seem to be negatively impacting Internet acti ity or the startup scene within the country.[19] In addition, Turish telecommunications provider Eser Telekom announced[20] in September that it would be leveraging Eutelsat's Tooway satellite Internet service to bring download speeds of up to 10 Mbps to customers beyond the reach of terrestrial broadband networks.



Global Rank	Country	% Above 5 Mbps	QoQ Change	YoY Change
2	Netherlands	68%	-1.3%	39%
6	Belgium	54%	-5.8%	55%
7	Denmark	51%	-1.2%	45%
8	Switzerland	51%	2.8%	98%
9	Romania	51%	-2.9%	0.2%
10	Czech Republic	50%	-8.0%	58%
12	United Arab Emirates	47%	129%	322%
14	Hungary	41%	-0.2%	63%
15	Norway	40%	-1.5%	55%
16	Portugal	40%	-9.3%	86%
18	Finland	36%	0.2%	49%
19	Ireland	36%	14%	101%
21	Germany	33%	-3.4%	64%
23	Sweden	31%	3.2%	8.4%
25	United Kingdom	31%	3.6%	82%
28	Austria	30%	-2.0%	72%
33	Poland	23%	-0.2%	75%
36	Slovakia	22%	-2.8%	105%
41	Spain	18%	4.1%	231%
42	France	15%	-1.4%	56%
43	Italy	14%	-15%	77%
55	Turkey	3.7%	27%	161%

Figure 33: High Broadband Connectivity, Fastest European Countries

Quarterly changes across the rest of Europe were less positive in the third quarter, with twice as many countries seeing high broadband adoption rates decline from the second quarter as the number that saw a quarterly increase in high broadband adoption rates. However, as we've seen with other metrics, the rate of decline has generally been fairly nominal – Italy's 15% loss was the largest. The 129% quarterly increase seen in the United Arab Emirates notwithstanding, the quarterly gains in the region were unfortunately also fairly nominal, with most less than 10%.

Yearly changes in high broadband adoption spanned a huge range, from the scant 0.2% increase in Romania to increases of greater than 100% in Turkey, Spain, Slovakia, Ireland, and the United Arab Emirates. In the second quarter, Switzerland had grown more than 100% year-over-year as well, but this quarter, growth slowed slightly, with the country seeing a yearly increase of "just" 98%.

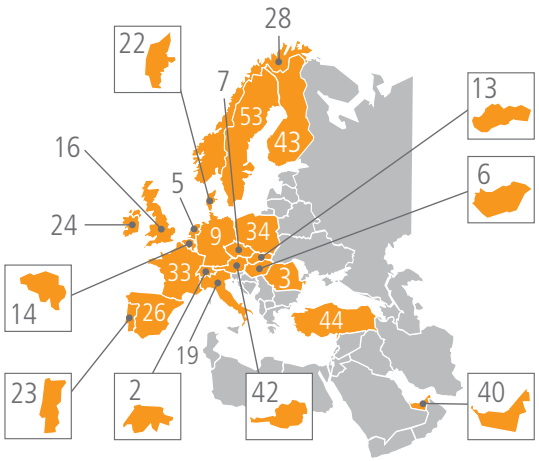
6.6 Europe Broadband Connectivity

As illustrated in Figure 34, broadband adoption remained extremely strong across Europe in the third quarter, with all but one country seeing 75% or more of its connections to Akamai at speeds of 2 Mbps or above. The lone outlier was Sweden, where a 69% broadband adoption rate placed it last among surveyed European countries. In the third quarter, nine countries had broadband adoption rates of 90% or greater, down from 11 countries that achieved the same in the second quarter.

Quarterly changes in broadband adoption were not as widely positive as in the second quarter, with the third quarter having one country see no change, 10 countries increasing broadband adoption, and 11 countries seeing broadband adoption levels decline. Setting aside the 54% quarter-over-quarter change seen in the United Arab Emirates, the increases seen in the other countries were tempered, with all of them seeing growth of less than 10% -- in fact, six of them grew just 1% or less. The losses seen were tempered as well, with six countries declining just 1% or less, and Portugal's 4.6% decline the largest of the group.

Year-over-year, broadband adoption grew in all of the surveyed European countries. Turkey and the United Arab Emirates more than doubled broadband adoption from the third quarter of 2010, while seven additional countries increased broadband adoption by 10% or more. The smallest change was seen in Denmark, with a year-over-year change of just 2.3%.

A poll conducted by Web site ISPreview found that found that almost two-thirds of Internet users in the United Kingdom would think twice about buying a "beautiful new house" if it lacked a fast broadband connection, and that half would pay more for a house with faster connectivity than they currently owned.[21] To that end, in August, the UK government announced a £530m fund to be used to enable all 25 million UK homes to ultimately have access to Internet connectivity with a minimum speed of 2 Mbps, with the potential for 90% of homes to connect at speeds approaching 24 Mbps.[22]



Global Rank	Country	% Above 2 Mbps	QoQ Change	YoY Change
2	Switzerland	96%	1.0%	4.6%
3	Romania	95%	0.1%	4.5%
5	Netherlands	95%	–	8.0%
6	Hungary	94%	-0.2%	11%
7	Czech Republic	94%	-1.6%	5.1%
9	Germany	94%	0.1%	6.3%
13	Slovakia	91%	-0.1%	16%
14	Belgium	91%	-0.1%	5.6%
16	United Kingdom	91%	-0.8%	6.9%
19	Italy	89%	-1.3%	8.3%
22	Denmark	88%	-1.5%	2.3%
23	Portugal	86%	-4.6%	4.3%
24	Ireland	85%	1.0%	19%
26	Spain	84%	-0.8%	33%
28	Norway	84%	-0.8%	2.7%
33	France	82%	-2.5%	8.5%
34	Poland	81%	0.1%	59%
40	United Arab Emirates	79%	54%	157%
42	Austria	78%	0.3%	19%
43	Finland	76%	3.2%	27%
44	Turkey	75%	4.5%	186%
53	Sweden	69%	7.6%	3.5%

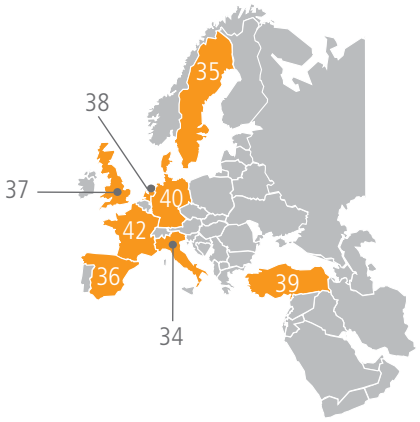
Figure 34: Broadband Connectivity, Fast European Countries

6.7 Europe Narrowband Connectivity

In reviewing Figure 35, it is clear that once again, nearly two-thirds of the listed countries in Europe did not qualify for inclusion in this metric because Akamai did not see the requisite 25,000 or more unique IP addresses making requests for content at speeds below 256 kbps. Given the particularly high levels of broadband penetration within the European region, this is not entirely unexpected. All of the eight countries that qualified for inclusion, and that were ranked globally, had narrowband adoption rates below 1%.

Five countries saw narrowband adoption levels decline quarter-over-quarter, while the other three had higher levels of narrowband adoption. The latter set included Sweden and the Netherlands, which had unusually high increases of 39% and 47% respectively. Double-digit percentage quarterly losses were seen in three countries – Spain, Turkey, and Germany. Year-over-year declines, all more than 10%, were seen seven of the eight qualifying countries, with just Turkey seeing an increase (of 12%).

Among the countries that did not qualify for inclusion, Slovakia again had the highest narrowband adoption rate (1.1%), while three countries showed narrowband adoption of just 0.1%. Most of these countries saw narrowband adoption levels decline on a quarterly basis, and all but one had lower levels of broadband adoption as compared to the third quarter of 2010.



Global Rank	Country	% Below 256 kbps	QoQ Change	YoY Change
34	Italy	0.8%	0.5%	-39%
35	Sweden	0.7%	39%	-52%
36	Spain	0.6%	-16%	-38%
37	United Kingdom	0.5%	-5.3%	-44%
38	Netherlands	0.5%	47%	-37%
39	Turkey	0.4%	-11%	12%
40	Germany	0.4%	-19%	-47%
42	France	0.3%	-4.6%	-40%
–	Slovakia	1.1%	-37%	155%
–	Ireland	0.8%	-45%	-72%
–	United Arab Emirates	0.8%	-44%	-80%
–	Norway	0.6%	-12%	-22%
–	Switzerland	0.3%	-23%	-46%
–	Finland	0.3%	-4.2%	-60%
–	Austria	0.3%	-7.7%	-70%
–	Belgium	0.2%	-11%	-53%
–	Denmark	0.2%	0.4%	-77%
–	Poland	0.2%	-29%	-71%
–	Portugal	0.2%	6.6%	-24%
–	Romania	0.1%	-17%	-55%
–	Hungary	0.1%	-11%	-62%
–	Czech Republic	0.1%	14%	-71%

Figure 35: Narrowband Connectivity, Slowest European Countries

DID YOU KNOW?

Neelie Kroes, VP for the digital agenda at the European Commission called on leaders of Europe's telcos to draw up proposals on how to meet the European broadband targets. The aim is for all EU citizens to have access to basic broadband by 2013, but the main challenge facing telcos is to reach internet coverage of 30Mbps or above for all Europeans by 2020, with over half subscribing to connections of 100Mbps or higher.

[Source: http://www.capacitymagazine.com/Article/2865460/European-telcos-release-proposals-regarding-broadband.html]

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. Akamai and Ericsson have partnered to develop the first ever end-to-end solution to address performance, scalability, and availability of mobile content and applications on a global scale.[23]

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 2011 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 Attack Traffic from Mobile Networks, Top Originating Countries

In reviewing the data presented in Figure 36, we find that there were once again some significant changes in the distribution of attack traffic sourced in mobile networks in the third quarter of 2011. Most notably, Italy vaulted back to the top of the list, with more than double the attack traffic percentage seen in the second quarter. Other notable increases were seen in Chile, Australia, Poland, China, and Lithuania, which all saw growth in the 80% to 100%+ range. In contrast, the United States saw its traffic percentage drop by more than a factor of eight quarter-over-quarter, moving it from the top of the list last quarter to sixth place in the third quarter. Russia also saw a significant decline, dropping from 13% in the second quarter to 2.5% this quarter.

Other changes to the list include the Ukraine supplanting Hungary, placing eighth with 2.9% of observed attack traffic. In addition, observed attack traffic was significantly less concentrated than in prior quarters, with the top three countries generating slightly less than half of it, while the top 10 countries generated just over three-quarters of it.

	Country	Q3 '11 % Traffic
1	Italy	31%
2	Chile	11%
3	Australia	6.2%
4	Poland	5.9%
5	China	5.2%
6	United States	5.0%
7	Lithuania	3.0%
8	Ukraine	2.9%
9	Russia	2.5%
10	Malaysia	2.5%
–	Other	24%

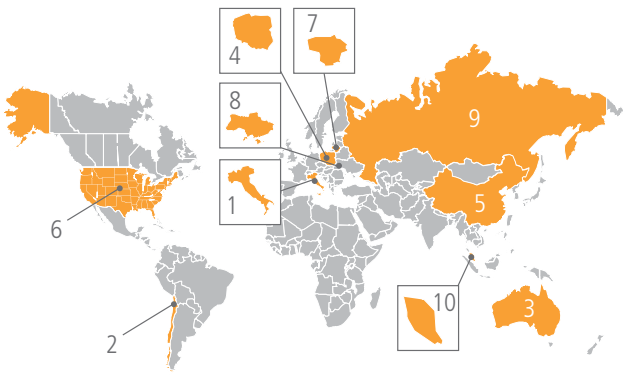


Figure 36: Attack Traffic from Mobile Networks, Top Originating Countries

7.2 Attack Traffic from Mobile Networks, Top Ports

In the third quarter of 2011, the list of the top 10 ports targeted by attack traffic sourced in mobile networks remained the same as in the second quarter, as shown in Figure 37. Port 445 (Microsoft-DS), unsurprisingly, continued to top the list in the third quarter, though its percentage was down just slightly from the prior quarter. (The concentration of traffic targeting this port has ranged between 75-80% over the last year, so the third quarter's figure is well within that range.) The percentage of attacks targeting Ports 22 & 23 (SSH and Telnet, respectively) declined quarter-over-quarter, possibly indicating a decline in brute-force efforts to log in to Internet-connected systems from attackers on mobile networks using default or stolen usernames/passwords. Overall attack concentration dropped slightly in the third quarter as well, with just under 95% of attacks targeting the top 10 ports (down from just over 97% in the second quarter.)

As we have observed in prior reports, we believe that the observed attack traffic originating from known mobile networks is likely being generated by infected PC-type clients connecting to wireless networks through mobile broadband technologies, and not by infected smartphones or similar mobile connected devices.

Port	Port Use	Q3 '11 % Traffic
445	Microsoft-DS	77%
23	Telnet	5.6%
135	Microsoft-RPC	3.1%
1433	Microsoft SQL Server	2.9%
80	WWW (HTTP)	1.6%
5900	VNC Server	1.2%
22	SSH	1.0%
3389	Microsoft Terminal Services	1.0%
139	NetBIOS	0.9%
4899	Remote Administrator	0.6%
Various	Other	5.1%

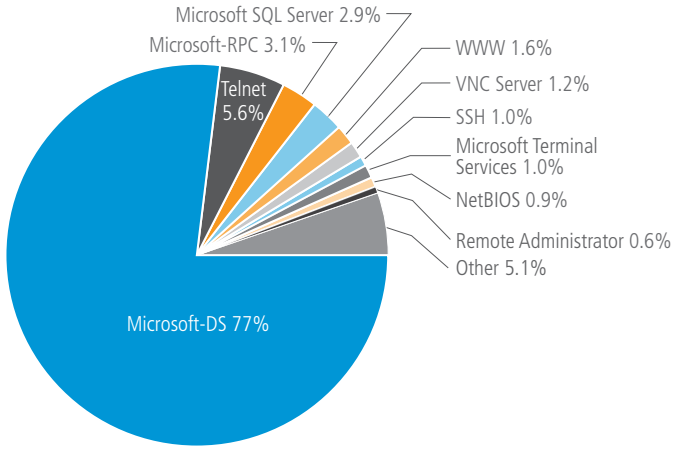


Figure 37: Attack Traffic from Mobile Networks, Top Ports

DID YOU KNOW?

- *2011 is shaping up to be the year that mobile malware became an issue for consumers and enterprises alike in North America. …Many of these devices connect to the corporate WiFi when brought to work. They come into the network infected, and traditional security systems designed to protect traditional computing assets will not detect these infected mobile devices.*

  [Source: http://landing.damballa.com/20110908-1H2011ThreatReport.html]

- *99% of all detected threats targeting mobile platforms are malicious programs that are after one and the same goal: generating money unlawfully, either directly or indirectly.*

  [Source: http://www.securelist.com/en/analysis/204792190/Monthly_Malware_Statistics_August_2011]

7.3 Connection Speeds & Data Consumption on Mobile Networks

In the third quarter of 2011, mobile provider PL-4 regained its position as the provider with the highest average connection speed, at 6.1 Mbps. It last held this position in the first quarter, also with a speed of 6.1 Mbps. In reviewing the 102 mobile providers listed in Figure 38, we find that there were only three with average connection speeds in the "high broadband" (>5 Mbps) range: PL-4, last quarter's leader GR-1, and DE-2 in Germany – the latter two carriers squeaked by with average speeds just a bit over 5 Mbps. An additional 28 carriers had average connection speeds in the "broadband" (>2 Mbps) range, while another 49 achieved average connection speeds above 1 Mbps in the third quarter. The mobile provider with the lowest average connection speed was TH-1 in Thailand, at 149 kbps. (As noted in a prior section of the report, this may be related to the devastating flooding within the country, as the carrier's speeds are down 73% quarter-over-quarter and 71% year-over-year.) The former slowest mobile provider, SK-1 in Slovakia, continued to see quarterly and yearly increases in its average connection speed, reaching 327 kbps.

In reviewing quarterly changes, there were no providers that saw average connection speeds double between the second and third quarters. Provider NC-1 in New Caledonia came closest, growing 83% quarter-over-quarter, to 1.1 Mbps. Quarterly growth of less than 1% was seen at three providers – AR-1 in Argentina, UK-3 in the United Kingdom, and HU-1 in Hungary, while BG-1 in Bulgaria remained unchanged. Quarterly declines in average connection speed were observed at 38 providers, ranging from a 0.2% loss at Morocco's MA-1 to the previously mentioned 73% loss at Thailand's TH-1. Looking at yearly trends, we find that average connection speeds increased by more than 100% year-over-year at 13 providers, with the 272% growth at UA-1 in the Ukraine the largest. Only 11 providers saw yearly declines in average connection speed, with six of those providers dropping less than 10%.

Examining the average peak connection speed data for the third quarter of 2011, we find that Spanish provider ES-1 just slightly edged out last quarter's leader (AT-2 in Austria). With an average peak connection speed of 22.2 Mbps, ES-1 was slightly less than 150 kbps faster than AT-2. Of the listed mobile providers, Canada's CA-1 and Germany's DE-2 also had average peak connection speeds above 20 Mbps, while 28 additional providers reached average peak connection speeds above 10 Mbps. Average peak connection speeds above 5 Mbps were seen in 45 more mobile providers, while all but two (TH-1 in Thailand & ZA-1 in South Africa) had average peak connection speeds above 2 Mbps. The provider with the lowest average peak connection speed remained ZA-1 in South Africa, at 1.4 Mbps, an increase of approximately 16% from the prior quarter.

In looking at quarterly changes, we find that four providers (IN-1 in India, QA-1 in Qatar, NC-1 in New Caledonia, and SG-4 in Singapore) saw average peak connection speeds grow by more than 100% quarter-over-quarter. Of the four, IN-1, QA-1, and SG-1 all grew to have average peak connection speeds in the 9-10 Mbps range in the third quarter. Quarterly increases in average connection speeds were also seen at 58 other providers, while 39 providers experienced declines in average peak connection speeds. On a year-over-year basis, growth in average peak connection speeds of 100% or more was seen at just 10 providers (down from 29 in the second quarter), with the 262% increase at Ukrainian provider UA-1 the largest. An additional 75 providers also saw yearly increases, while just 13 saw average peak connection speeds decline as compared to the third quarter of 2010.

For the third quarter of 2011, we found that users on nine mobile providers consumed, on average, one gigabyte (1 GB) or more of content from Akamai per month. (Note that this does not include provider CA-1, which was previously confirmed to be using a proxy architecture.) Users on an additional 75 mobile providers around the world downloaded more than 100 MB of content from Akamai per month during the third quarter, while users at 17 other providers downloaded fewer than 100 MB. Quarterly growth in download volumes was seen at 62 providers, while yearly growth was seen at just 45 providers. Nine of these providers saw content download volumes more than double year-over-year, led by Austria's AT-2, with a 371% increase. Interestingly, while Thai carrier TH-1 was highlighted for the declines seen in average and average peak connection speeds, it posted strong growth in content download volume, with a 37% increase quarter-over-quarter. The number of unique IP addresses observed from the provider remained consistent between the second and third quarters, so this observation may point to Thai citizens relying more heavily on their mobile devices for Web-based communication and to obtain critical information during a time of crisis.

Country	ID	Q3 '11 Avg. kbps	Q3 '11 Peak kbps	Q3 '11 Avg. MB/ month
AFRICA				
Egypt	EG-1	575	3344	155
Morocco	MA-1	1256	10925	322
Nigeria	NG-1	254	5024	514
South Africa	ZA-1	438	1386	168
ASIA				
China	CN-1	1475	3927	247
Hong Kong	HK-2	1925	10842	583
Hong Kong	HK-1	2323	10090	3674
India	IN-1	1597	9443	274
Indonesia	ID-1	475	7172	4906
Israel	IL-1	1435	6419	69
Kuwait	KW-1	1444	6979	252
Malaysia	MY-3	1024	7598	361
Malaysia	MY-1	730	8553	718
Pakistan	PK-1	691	4682	332
Qatar	QA-1	1620	10074	281
Saudi Arabia	SA-1	1672	8713	357
Singapore	SG-3	1480	7414	419
Singapore	SG-4	1585	9490	289
Sri Lanka	LK-1	894	7373	327
Taiwan	TW-1	1302	6331	145
Taiwan	TW-2	949	5113	78
Thailand	TH-1	149	1412	135
EUROPE				
Austria	AT-1	2903	10722	142
Austria	AT-2	3799	22044	5431
Belgium	BE-1	3013	11855	446
Belgium	BE-2	1938	5277	22
Bulgaria	BG-1	1715	7499	127
Czech Republic	CZ-1	1709	8630	87
Czech Republic	CZ-3	3667	11560	282
Czech Republic	CZ-2	1228	5405	195
Estonia	EE-1	1401	7487	264
France	FR-2	2382	8542	1714
Germany	DE-1	967	3720	93
Germany	DE-2	5027	21045	1726
Germany	DE-3	1899	7719	160
Greece	GR-2	1199	4179	132
Greece	GR-1	5056	16856	662
Hungary	HU-2	2539	13548	133
Hungary	HU-1	1863	8481	130
Ireland	IE-1	2880	14055	725
Ireland	IE-2	1937	15187	797
Ireland	IE-3	2079	15391	930
Italy	IT-2	3420	15566	647
Italy	IT-4	3294	17815	411
Italy	IT-4	1413	8693	219
Lithuania	LT-2	1973	11945	414
Lithuania	LT-1	2613	14038	544
Moldova	MD-1	1791	7183	142
Netherlands	NL-2	3613	6632	49

Figure 38: Average and Average Peak Connection Speed, Average Megabytes Downloaded per Month by Mobile Provider

DID YOU KNOW?

- *Mobile is fundamentally reshaping how we as consumers spend from housing and healthcare to entertainment and travel, from food and drinks to communication and transportation. Mobile not only influences purchase behavior but also post purchase opinions.*

[Source: http://www.chetansharma.com/globalmobileupdate1H2011.htm]

Country	ID	Q3 '11 Avg. kbps	Q3 '11 Peak kbps	Q3 '11 Avg. MB/ month
Netherlands	NL-1	1763	4871	36
Norway	NO-2	2071	6752	58
Norway	NO-1	2175	9062	69
Poland	PL-1	3652	17752	156
Poland	PL-2	1511	7593	78
Poland	PL-4	6112	17448	118
Portugal	PT-1	880	4277	200
Romania	RO-1	884	4250	91
Russia	RU-3	995	3990	117
Russia	RU-4	3600	13756	412
Slovakia	SK-1	327	2077	38
Slovakia	SK-2	2382	10658	1862
Slovenia	SI-1	2189	8687	54
Spain	ES-1	4867	22192	370
Spain	ES-3	1227	9254	241
Spain	ES-2	1089	8648	149
Turkey	TR-1	1771	7975	203
Ukraine	UA-1	2227	7500	128
Ukraine	UA-2	1845	7146	134
United Kingdom	UK-3	4009	19334	81
United Kingdom	UK-2	2540	11725	1320
United Kingdom	UK-1	2068	18277	863
NORTH AMERICA				
Canada	CA-2	1171	2923	608
El Salvador	SV-2	1871	9267	610

Country	ID	Q3 '11 Avg. kbps	Q3 '11 Peak kbps	Q3 '11 Avg. MB/ month
El Salvador	SV-1	1578	8115	359
El Salvador	SV-3	926	4782	353
Guatemala	GT-2	1013	6570	729
Guatemala	GT-1	1441	7379	411
Mexico	MX-1	1233	6938	94
Nicaragua	NI-1	1551	7886	754
Puerto Rico	PR-1	2639	10975	2703
United States	US-2	1072	4411	47
United States	US-1	1631	4551	146
United States	US-3	1038	3268	619
OCEANIA				
Australia	AU-3	1553	7878	222
Australia	AU-1	1236	13572	2224
Guam	GU-1	957	4663	101
New Caledonia	NC-1	1070	4757	854
New Zealand	NZ-2	1880	9988	768
SOUTH AMERICA				
Chile	CL-4	908	9711	483
Chile	CL-3	1560	11207	133
Colombia	CO-1	1003	6541	156
Paraguay	PY-2	356	4452	399
Paraguay	PY-1	643	5850	163
Uruguay	UY-1	1984	17042	276
Uruguay	UY-2	542	4712	63
Venezuela	VE-1	911	6146	178

DID YOU KNOW?

- *37% of all smartphones sold globally in Q3 were sold in the US. … Smartphones now account for over 80% revenue of all phones sold in the US.*
- *The US wireless data market grew 5% Q/Q and 21% Y/Y to reach $17B in mobile data service revenues in Q3 2011.*

[Source: http://www.chetansharma.com/blog/2011/12/12/us-wireless-data-market-update-q3-2011/]

7.4 MobileTraffic 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 Ericsson 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 and the seasonal slowdown in growth observed last quarter is now replaced by continued strong growth. However, 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 between operators due to their different customer profiles.

As illustrated in Figure 39, the volume of mobile data traffic doubled from the third quarter of 2010 to the third quarter of 2011, and between the second and third quarters of 2011, grew 18%.

7.5 Smartphone Usage As Observed by Ericsson

There are variations in the service availability and data plans provided by operators around the world, with both factors impacting subscriber behavior. This section focuses on the effects of data plans on traffic volumes and application usage on mobile PC terminals. The results presented here are based on measurement and analysis of one mature operator's 3G network. (To maintain operator anonymity, we cannot disclose their name or what geography they operate in.) Figure 40 shows average per subscriber monthly traffic volumes for different applications split by data plan cluster. Subscribers are clustered according to their monthly cap; each of these subscribers is limited to lower speeds after reaching their cap.

The impact of caps differs significantly per application. The average monthly traffic volume resulting from applications such as online media and file sharing increases significantly with data plan caps. Web browsing is an exception here and reaches a saturation point around the 5-10 GB data plan cap (i.e., users on the 5-10 GB and 10-20 GB data plans use around the same volume for web browsing). Similar saturation phenomena can be observed for social networking and software update traffic as well. Note that "online media" is an umbrella category for online video (e.g. YouTube), Web TV, online audio and radio services, etc. Online video is the largest sub-category in this measurement.

Figure 41 shows the average ratio of unused data in each plan and the ratio of subscribers running over the volume data cap for the same operator as highlighted above. As expected, data usage increases with larger data plans. However, the average utilization of data included in the plan decreases as cap size increases. Note that

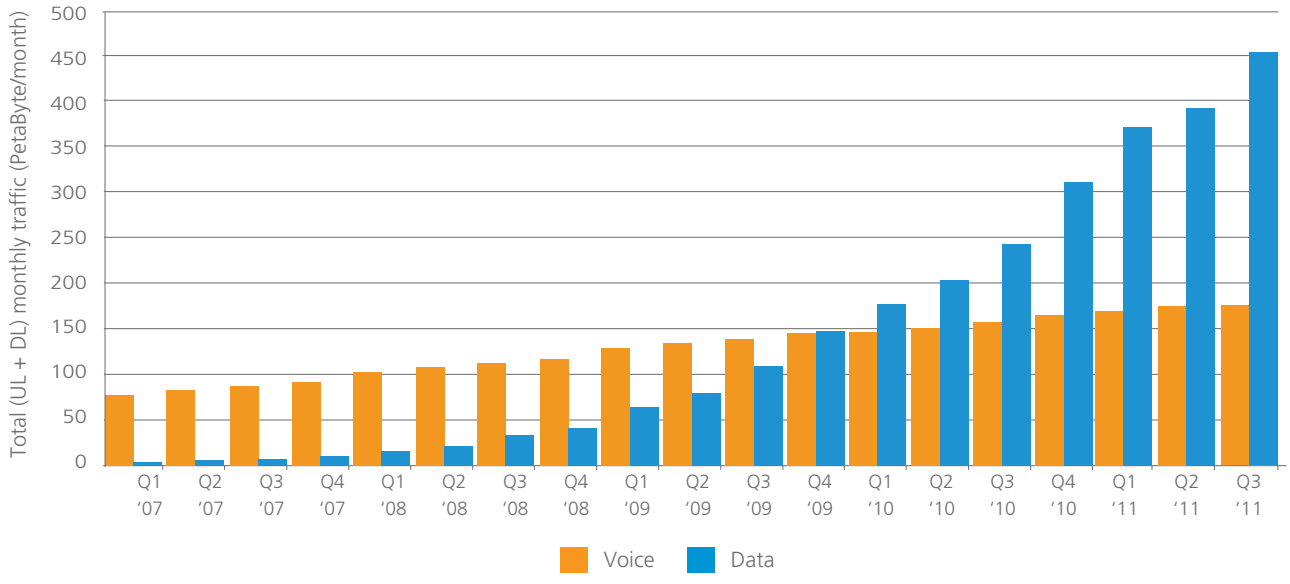


Figure 39: Total Monthly Mobile Voice and Data as Measured by Ericsson

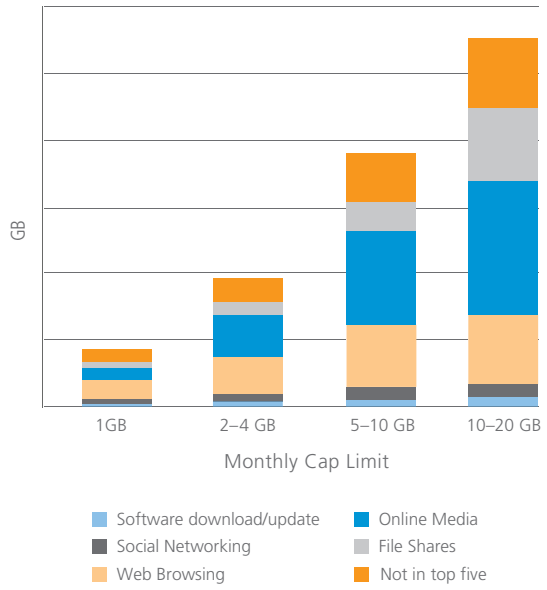


Figure 40: Traffic Mix for Different Data Plans

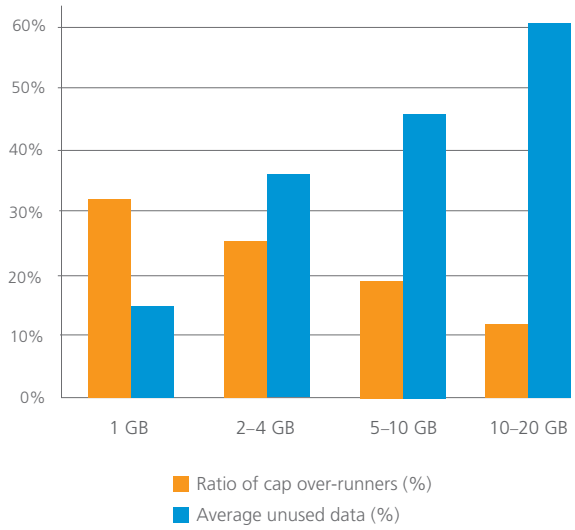


Figure 41: Cap Utilization Ratio for Different Data Plans

as these measurements focus on a single month, subscribers consuming data volumes below the cap could become cap over-runners during another month, and vice versa. This means that although many users in the highest data plan could fit in a lower data plan one month, next month they might not, and to avoid being throttled down to a lower speed staying at a higher data plan is more important. With the high percentage of over runners in the lower data plan, analysis of the data may indicate that many subscribers would benefit from purchasing higher data plans.

The way operators handle over-runners also affects the subscribers' monthly traffic volumes. Figures 40 and 41 refer to subscriber clusters where subscribers are limited to lower data speeds after reaching their monthly cap. Figure 42 shows the difference between limiting speeds and levying an additional charge for additional usage/download volume. The graph compares the 2-4 GB subscriber cluster from Figure 40 with a subscriber cluster with identical cap limits but different data plan policy applied when reaching the monthly cap. Subscribers with plans that apply a surcharge once a cap is reached use significantly lower volumes than those who are simply limited to lower speeds after reaching the cap.

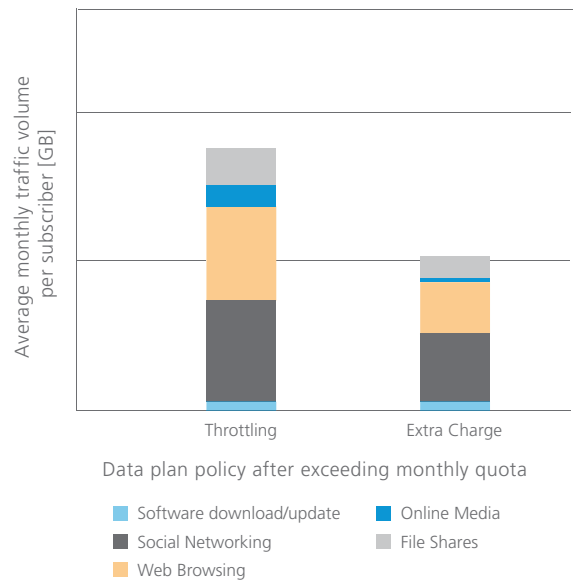


Figure 42: Traffic Mix for Different Data Plan Policies After Reaching Cap

Region	% Attack Traffic	Unique IP Addresses	Avg. Connection Speed (Mbps)	Peak Connection Speed (Mbps)	% Above 5 Mbps*	% Above 2 Mbps*	% Below 256 kbps*
EUROPE							
Austria	0.1%	2,994,080	5.4	18.3	30%	78%	–
Belgium	<0.1%	3,885,803	6.2	26.9	54%	91%	–
Czech Republic	0.4%	2,059,329	7.3	22.2	50%	94%	–
Denmark	<0.1%	2,680,572	6.3	20.2	51%	88%	–
Finland	<0.1%	2,895,343	5.7	19.8	36%	76%	–
France	0.9%	24,185,767	3.8	15.8	15%	82%	0.3%
Germany	1.8%	34,501,208	5.3	20.6	33%	94%	0.4%
Greece	0.1%	2,551,131	3.7	18.9	12%	84%	–
Hungary	1.7%	2,221,847	5.9	24.6	41%	94%	–
Iceland	<0.1%	142,503	5.8	22.9	30%	88%	–
Ireland	<0.1%	1,473,546	7.0	23.4	36%	85%	–
Italy	2.1%	14,352,738	4.0	16.2	14%	89%	0.8%
Luxembourg	<0.1%	171,145	4.4	15.4	19%	89%	–
Netherlands	0.3%	7,995,919	8.5	25.5	68%	95%	0.5%
Norway	<0.1%	3,431,230	6.2	22.2	40%	84%	–
Poland	1.7%	6,977,625	4.3	16.8	23%	81%	–
Portugal	0.2%	2,751,682	5.1	25.0	40%	86%	–
Romania	2.4%	2,413,573	6.6	34.5	51%	95%	–
Slovakia	<0.1%	791,519	5.5	20.2	22%	91%	–
Spain	0.8%	13,065,839	4.0	18.9	18%	84%	0.6%
Sweden	0.3%	6,442,636	5.3	20.8	31%	69%	0.7%
Switzerland	0.4%	3,056,999	7.5	25.0	51%	96%	–
United Kingdom	0.7%	22,439,229	5.1	20.0	31%	91%	0.5%
ASIA/PACIFIC							
Australia	0.4%	12,570,515	3.6	16.2	18%	55%	1.8%
China	8.6%	81,661,744	1.4	5.5	1.0%	18%	3.3%
Hong Kong	0.5%	2,733,180	10.5	46.0	60%	93%	–
India	3.7%	9,163,796	0.9	5.8	0.6%	10%	29%
Japan	2.1%	44,014,718	8.9	32.9	57%	78%	0.9%
Malaysia	0.4%	1,813,970	1.9	12.8	4.6%	21%	–
New Zealand	0.2%	1,841,855	4.0	16.7	23%	72%	3.3%
Singapore	0.3%	1,561,980	4.5	21.8	31%	63%	–
South Korea	3.8%	19,889,809	16.7	46.8	79%	94%	0.3%
Taiwan	11%	8,957,719	4.1	22.5	28%	73%	–
MIDDLE EAST							
Egypt	3.3%	1,481,933	1.0	7.8	--	6.6%	4.0%
Israel	0.6%	2,437,186	4.8	22.3	20%	84%	–
Kuwait	0.1%	597,929	2.5	13.8	8.6%	38%	–
Saudi Arabia	0.2%	2,517,539	2.0	8.5	2.1%	38%	–
Sudan	<0.1%	41,779	0.9	6.7	–	–	–
Syria	<0.1%	334,980	1.4	3.2	–	27%	18%
United Arab Emirates (UAE)	0.3%	1,051,382	6.0	n/a	47%	79%	–
LATIN & SOUTH AMERICA							
Argentina	1.4%	5,511,640	2.1	12.3	6.1%	37%	2.8%
Brazil	5.5%	16,262,525	1.9	12.1	5.5%	32%	7.4%
Chile	0.5%	3,042,256	3.1	17.2	8.2%	80%	–
Colombia	0.6%	3,325,949	2.6	12.5	4.1%	63%	–
Mexico	0.3%	9,565,542	2.5	12.7	3.0%	59%	1.0%
Peru	1.1%	855,935	1.4	10.6	–	15%	–
Venezuela	0.4%	2,072,095	0.8	5.5	–	2.7%	8.0%
NORTH AMERICA							
Canada	0.9%	12,901,574	5.9	21.7	47%	90%	1.1%
United States	7.3%	145,452,027	6.1	24.1	45%	81%	1.7%

** 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.*

SECTION 9:
Endnotes

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THE FUTURE IS FOREVER
6 JUNE 2012

Major Internet service providers (ISPs), home networking equipment manufacturers, and web companies around the world are coming together to permanently enable IPv6 for their products and services by 6 June 2012.

Organized by the Internet Society, and building on the sucessful one-day World IPv6 Day event held on 8 June 2011, World IPv6 Launch represents a major milestone in the global deployment of IPv6. As the successor to the current Internet Protocol, IPv4, IPv6 is critical to the Internet's continued growth as a platform for innovation and economic development.

For more information on World IPv6 Launch, go to www.worldipv6launch.org

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For more information on Akamai's support for IPv6, go to www.akamai.com/ipv6

Akamai

The "spinning globe" featured in the Akamai NOCC represents where Akamai servers are located and how much traffic they are seeing.

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