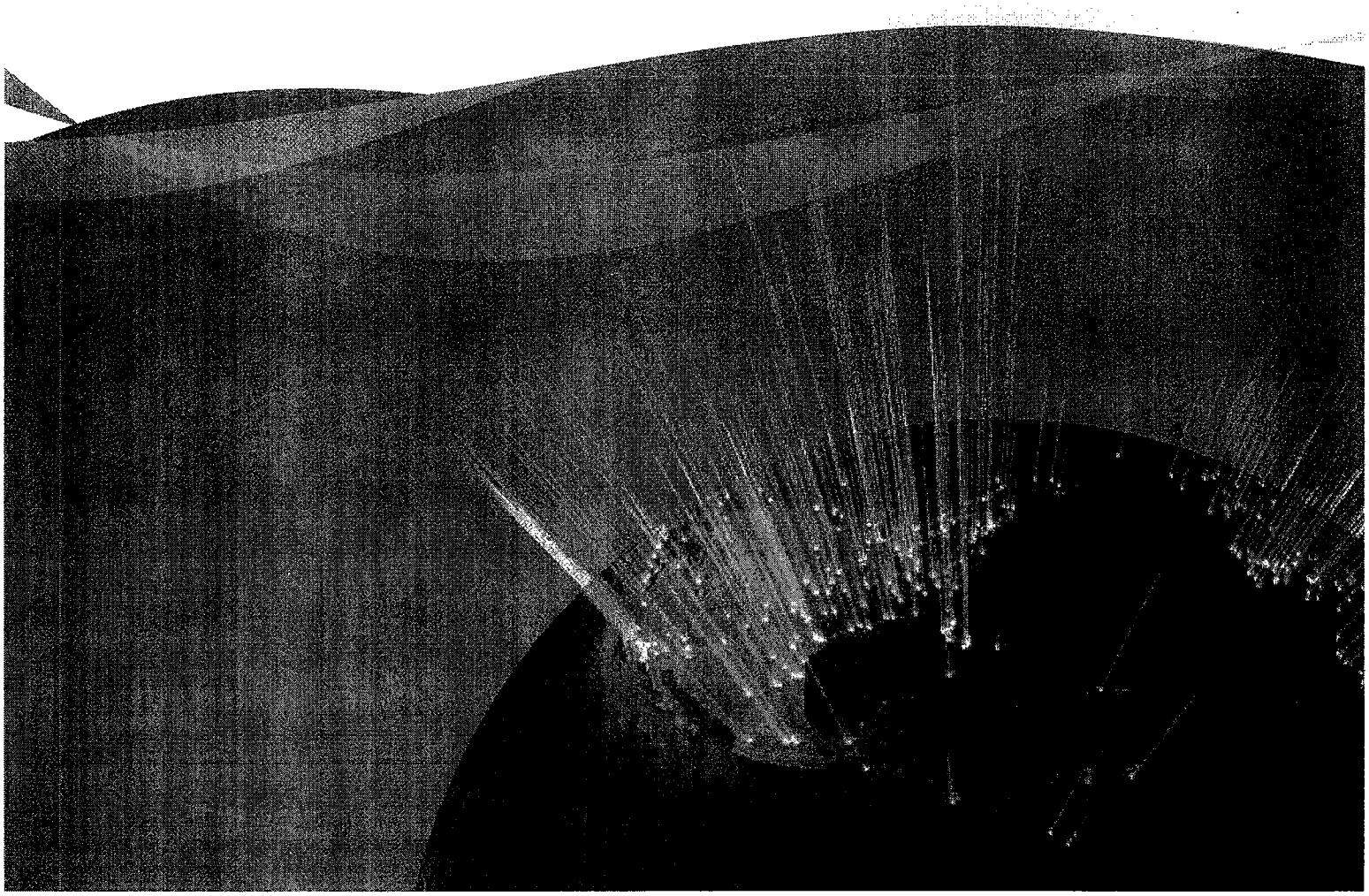
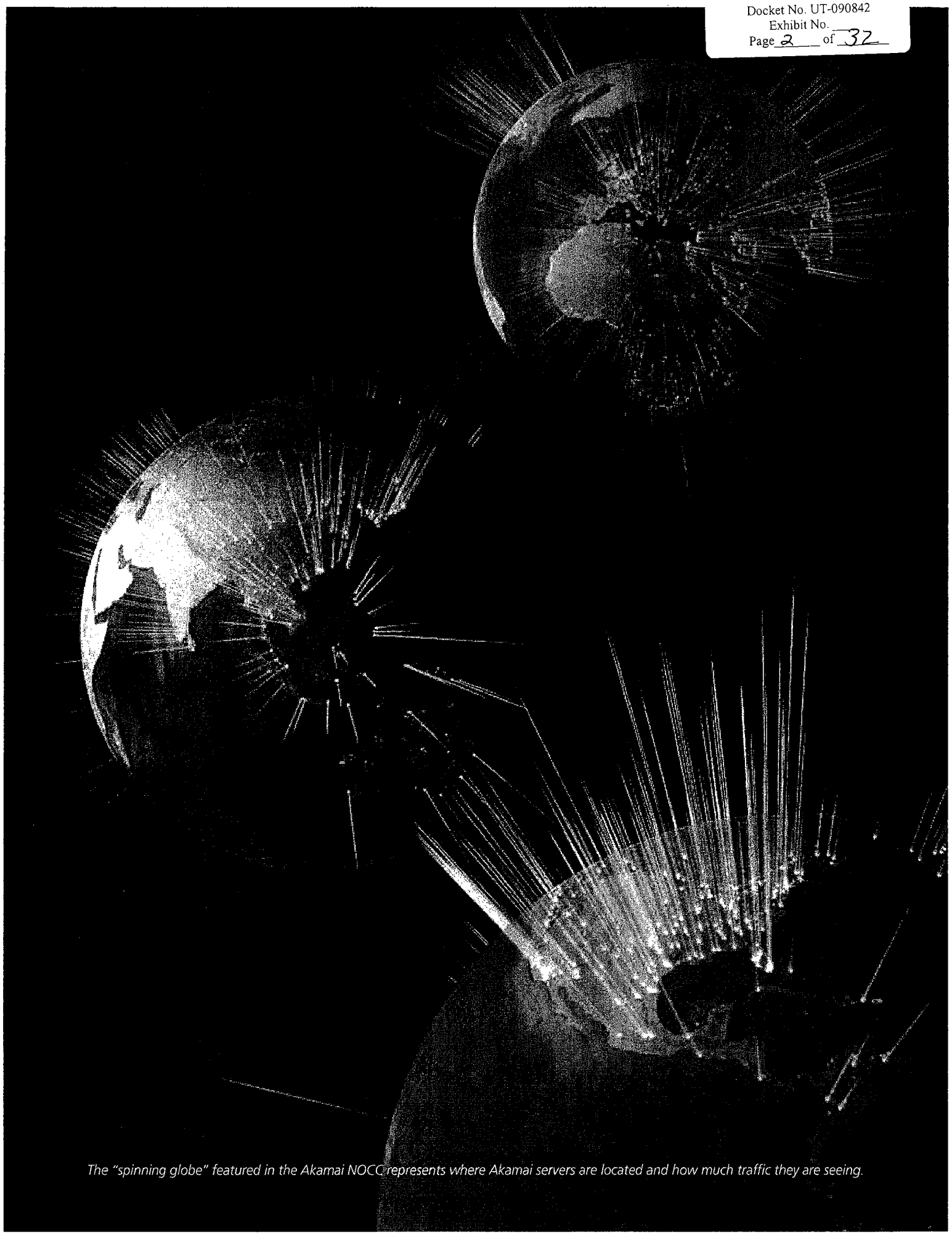
Akamai Volume 2, Number 3

REPORT

3rd Quarter, 2009

The State of the Internet





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

Executive Summary

Each quarter, Akamai publishes a "State of the Internet" report. This report includes data gathered from across Akamai's global server network about attack traffic and broadband adoption, as well as trends seen in this data over time. It also aggregates publicly available news and information about notable events seen throughout the quarter, including Denial of Service attacks, Web site hacks, and network events, including outages and new connections. (However, due to time constraints, this aggregated information has not been included within this quarter's published report.)

During the third quarter of 2009, Akamai observed attack traffic originating from 207 unique countries around the world. In a shift from prior quarters, Russia and Brazil unseated the United States and China as the two largest attack traffic sources, accounting for nearly 22% of observed traffic in total, half as much as was seen from China and the United States in the second quarter. Akamai observed attack traffic targeted at more than 3,800 unique ports, with the top 10 ports once again seeing nearly 95% of the observed attack traffic, up from 90% in the second quarter. (The additional concentration in the third quarter was again likely related to traffic associated with the Conficker worm and its variants.)

Akamai observed a four-and-a-half percent increase (from the second quarter of 2009) globally in the number of unique IP addresses connecting to Akamai's network. From a global connection speed perspective, South Korea continued to have the highest level of "high broadband" (>5 Mbps) connectivity and also maintained the highest average connection speed, at nearly 15 Mbps. In the United States, Delaware moved into the top position, with 63% of connections to Akamai occurring at 5 Mbps or greater. Delaware also maintained the highest average connection speed in the United States, at 7.2 Mbps.

Finally, average measured connection speeds among three leading mobile carriers in the United States were in the 700-750 Kbps range for the third quarter. Future *State of the Internet* reports will include additional metrics & measurements across additional carriers.

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Introduction

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.

In the third quarter of 2009, observed attack traffic continued to target a consistent set of ports, and attacks likely related to the ongoing spread of the Conficker worm continued to be responsible for an overwhelming percentage of the observed attacks. However, China and the United States were no longer the leading sources for this observed attack traffic, ceding the top spots to Russia and Brazil.

In the third quarter of 2009, the quarterly change in average connection speeds among countries around the world was mixed, though most countries continued to see increasing speeds on a year-over-year basis. In addition, the quarterly change in high broadband (connections to Akamai's network at speeds in excess of 5 Mbps) penetration was mixed, though most countries continued to see increasing high broadband penetration on a year-over-year basis as well. Twice as many countries around the world saw decreasing percentages of narrowband (<256 Kbps) connections to Akamai during the third quarter than the number of countries that saw an increase in narrowband connections. This ratio arguably represents a positive trend, potentially indicating a shift towards greater availability of higher speed Internet connections.

In response to the growing amount of Internet content being accessed through mobile devices such as smartphones and laptops equipped with mobile broadband connection technologies, and also in response to multiple inquiries for such data, starting with the *3rd Quarter, 2009 State of the Internet* report, Akamai will begin publishing insights into metrics collected from connections to Akamai that have been identified as coming from networks associated with mobile providers. During the third quarter of 2009, average connection speeds from three of the leading mobile providers within the United States were analyzed and determined to be in the 700-750 Kbps range. Over time, the number of metrics and mobile providers examined within the report is expected to expand.

Due to time constraints, the *3rd Quarter, 2009 State of the Internet* report does not include aggregated publicly available news and information about notable events seen throughout the quarter, including Denial of Service attacks, Web site hacks, and network events, including outages and new connections. However, we plan to return to including this information in future reports.

SECTION 2: Security

Akamai maintains a distributed set of agents deployed across the Internet that serve to monitor attack traffic. Based on the 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 layer protocol identifiers.) This section, in part, provides insight into Internet attack traffic, as observed and measured by Akamai, during the third quarter of 2009. While some quarter-over-quarter trending may be discussed, it is expected that both the top countries and top ports will change on a quarterly basis.

2.1 Attack Traffic, Top Originating Countries

Akamai observed attack traffic originating from 207 unique countries around the world.

During the third quarter of 2009, Akamai observed attack traffic originating from 207 countries. This count is roughly in line with the second quarter (201 countries), as well as levels seen in 2008. In a break with prior quarters, the United States and China did not hold the top two slots in the third quarter – Russia and Brazil were the two countries responsible for originating the largest amount of attack traffic observed by Akamai, as shown in Figure 1. The percentage of attack traffic originating from China declined nearly 80% quarter-over-quarter, and the United States declined just over 50%. Attack traffic was significantly less concentrated among the top countries in the third quarter as well – in prior quarters, the top two or three countries accounted for half of the observed attack traffic, while in the third quarter, seven countries were needed to reach that level.

Port 445 was overwhelmingly the top port targeted by attacks originating in Russia and Brazil, which may indicate the presence of a large number of systems in both countries actively participating in Conficker-related botnets. (Prior research[1] from CERT has indicated that both Russia and Brazil were among the countries with the highest levels of Conficker infections.) Similarly, all of the countries in the top 10 originated overwhelmingly large percentages of attacks targeted at port 445 in the third quarter, as compared to other ports.

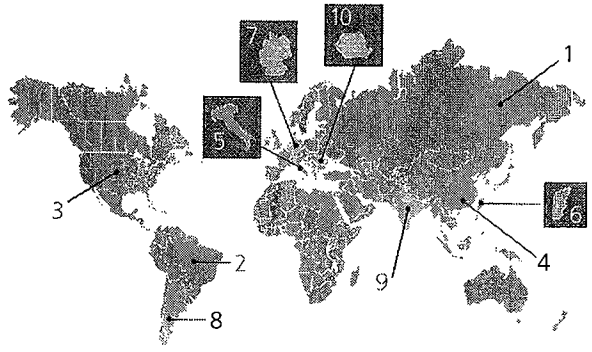


Figure 1: Attack Traffic, Top Originating Countries

	Country	% Traffic	Q2 09%
1	Russia	18%	4.2%
2	Brazil	8.6%	2.3%
3	United States	6.9%	15%
4	China	6.5%	31%
5	Italy	5.4%	1.2%
6	Taiwan	5.1%	2.3%
7	Germany	4.8%	1.9%
8	Argentina	3.6%	0.8%
9	India	3.4%	0.9%
10	Romania	3.2%	0.6%
–	Other	39%	31%

2.2 Attack Traffic, Top Target Ports

During the third quarter of 2009, Akamai observed attack traffic targeted at more than 3,800 unique ports. This count is just over seven percent lower than seen in the second quarter (4,100 unique ports). Of the countries in the top 10, United States-originated attacks targeted the largest number of unique ports (over 2400), while Romania-originated attacks targeted the smallest number of unique ports (just over 150).

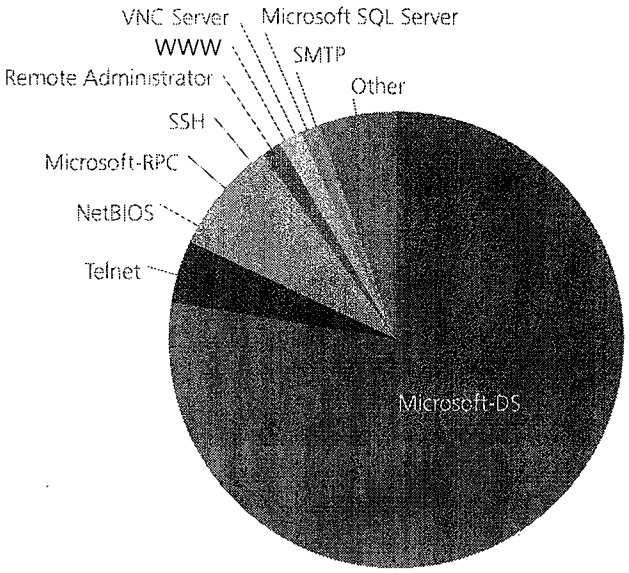
For the sixth consecutive quarter, attacks targeted at Port 445 were responsible for the highest percentage of the observed attacks.

Port 445 remained the most-targeted port for the sixth consecutive quarter, and continues to be overwhelmingly responsible for the highest percentage of attacks. In fact, attack concentration grew from the second quarter, as shown in Figure 2, with port 445 responsible for nearly 80% of observed attacks, and the top 10 targeted ports accounting for nearly 95% of observed attacks. The top 10 targeted ports remained consistent from the second quarter, though some position shifting occurred within the latter half of the list.

Although mainstream and industry media coverage of the Conficker worm and its variants has dropped significantly since peaking in the second quarter, it is clear from this data that the worm (and its variants) is apparently still quite active, searching out new systems to infect. In fact, infection tracking data[7] from the Conficker Working Group showed that the number of unique IPs connecting to their Conficker.A and Conficker.B tracking systems increased during the third quarter, as did the number of countries represented by these IP addresses. Interestingly, these same metrics showed declining trends for the Conficker.C variant during the third quarter.

Destination Port	Port Use	% Traffic	Q2 09%
445	Microsoft-DS	78%	68%
23	Telnet	4.4%	6.7%
139	NetBIOS	3.2%	4.4%
135	Microsoft-RPC	2.8%	3.1%
22	SSH	2.0%	2.5%
4899	Remote Administrator	1.3%	0.6%
5900	VNC Server	1.0%	1.7%
80	WWW	0.9%	1.6%
1433	Microsoft SQL Server	0.8%	1.3%
25	SMTP	0.4%	0.6%
Various	Other	5.5%	–

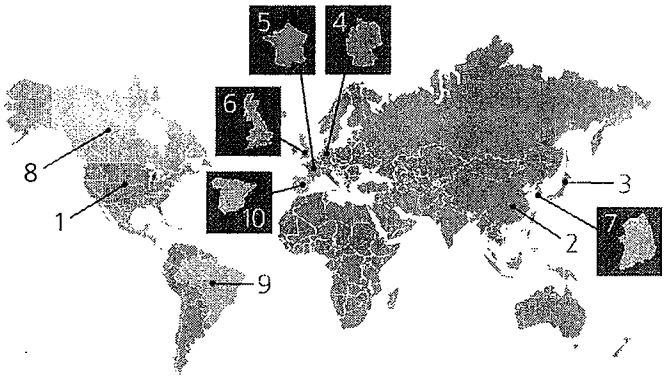
Figure 2: Attack Traffic, Top Traffic Ports



SECTION 3: Internet Penetration

3.1 Unique IP Addresses Seen By Akamai

Through a globally-deployed server network, and by virtue of the billions of requests for Web content that it services on a daily basis, Akamai has unique visibility into the levels of Internet penetration around the world. In the third quarter of 2009, slightly more than 444 million unique IP addresses, from 226 countries, connected to the Akamai network – four and a half percent more than in the second quarter of 2009, and 17 percent more than the same quarter a year ago. For the sixth consecutive quarter, the United States and China continued to account for nearly 40% of the observed IP addresses. The top 10 countries once again remained the same quarter-over-quarter, although Brazil slipped past Spain to move up into the 9th place slot.



Country	Q3 09 Unique IPs	Q2–Q3 Change	YoY Change
Global	444,082,241	4.5%	17%
1 United States	119,197,651	3.4%	8.0%
2 China	49,054,052	6.3%	30%
3 Japan	31,654,696	3.9%	15%
4 Germany	29,741,416	0.8%	15%
5 France	20,888,904	4.1%	17%
6 United Kingdom	19,426,576	4.7%	2%
7 South Korea	16,301,708	5.0%	3.0%
8 Canada	11,158,133	4.1%	8.3%
9 Brazil	10,810,334	7.3%	23%
10 Spain	10,414,031	3.0%	16%

Figure 3: Unique IP Addresses Seen By Akamai

In the third quarter of 2009, over 444 million unique IP addresses connected to the Akamai network.

As shown in Figure 3, the quarterly growth in the number of unique IP addresses seen by Akamai was modest, with Brazil once again having the highest rate of growth among the top 10 countries, gaining 7.3% quarter-over-quarter. Year-over-year growth among most of the top 10 countries was fairly strong as well, with yearly gains of more than 10 percent in seven of the top 10 countries, and a gain of 30% in China. In contrast, just over 50 countries globally saw unique IP counts decline in the third quarter. For the quarter, the top 10 countries accounted for just over 71% of the total global unique IP addresses seen by Akamai, down less than half a percent from the second quarter, and just over two percent less than the same quarter a year ago.

Looking at the "long tail," there were 179 countries with fewer than one million unique IP addresses connecting to Akamai in the third quarter of 2009, 137 with fewer than 100,000 unique IP addresses, and 30 with fewer than 1,000 unique IP addresses. All three counts are down slightly from prior quarters, which may indicate increased Internet penetration around the world.

3.2 Global Internet Penetration

How does the number of unique IP addresses seen by Akamai compare to the population of each of those countries? Asked another way, what is the level of Internet penetration in each of those countries? Using global population data[3] from the United States Census Web site as a baseline, levels of Internet penetration for each country around the world were calculated based on Akamai's view into Internet traffic. These per capita figures should be considered as an approximation, as the population figures used to calculate them are static estimates – obviously, they will change over time, and it would be nearly impossible to obtain exact numbers on a quarterly basis. In addition, individual users can have multiple IP addresses (handheld, personal/home system, business laptop, etc.). Furthermore, in some cases, multiple individuals may be represented by a single IP address (or small number of IP addresses), as they access the World Wide Web through a firewall or proxy server. Akamai believes that it sees approximately one billion users per day, though we see only approximately 444 million unique IP addresses.

Akamai believes that it sees approximately 1 billion users per day.

In comparing the unique IPs per capita figures for the third quarter of 2009, as shown in Figure 4, to those from the second quarter of 2009, we see some nominal movement among the top 10 countries. Denmark posted a significant enough increase to move it into the top 10, pushing out the Cayman Islands. Norway, Sweden, Finland, and the Netherlands remained the top four countries, while the United States' 11% growth moved it into the fifth place slot, up from number eight in the second quarter. Globally, 35 countries have Internet penetration levels of 25% or greater (0.25 or more unique IPs per capita), while 73 countries have levels of 10% or more (0.10 or more unique IPs per capita). Internet penetration rates of one percent or less were calculated for 99 countries in the third quarter of 2009.

	Country	Unique IPs per Capita
-	Global	0.05
1	Norway	0.49
2	Sweden	0.42
3	Finland	0.41
4	Netherlands	0.40
5	United States	0.40
6	Iceland	0.39
7	Monaco	0.39
8	Denmark	0.39
9	Falkland Islands	0.38
10	British Virgin Islands	0.37

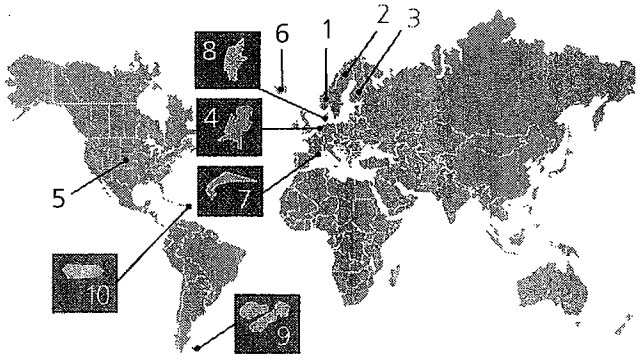


Figure 4: Global Internet Penetration

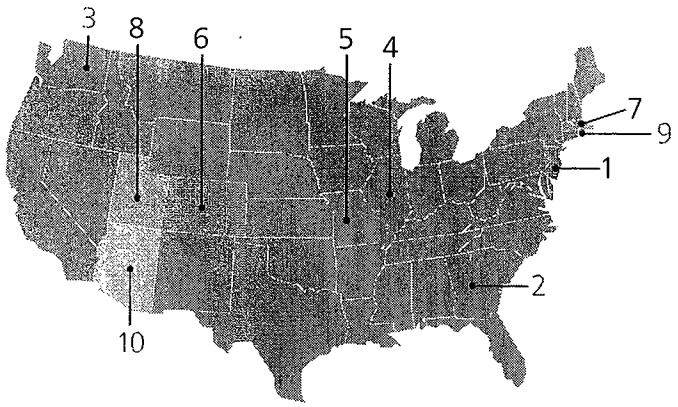
SECTION 3: Internet Penetration (continued)

3.3 United States Internet Penetration

Using state population estimates available from the United States Census Web site,[4] and the number of unique IP addresses from each state that Akamai saw in the third quarter of 2009, we calculated the levels of Internet penetration on a state-by-state basis – the top 10 states are shown in Figure 5. The same caveats noted above in Section 3.2, regarding per capita figures as an approximation, apply here as well.

As is evident in Figure 5, New Jersey has shot to the top spot in unique IPs per capita with an unusually high figure of just over one unique IP per capita. In analysis of the source data, it appears that this unusual occurrence is due to a recent modification made to Akamai's EdgeScape database, in which a number of IP address blocks were associated with locations in New Jersey, resulting in the number of unique IPs seen from the state effectively doubling quarter-over-quarter. (The Akamai EdgeScape database provides geolocation data for [blocks of] IP addresses, including country identifiers, state and province-level data for selected countries, and even city-level data for selected georegions. For additional information, see http://www.akamai.com/html/technology/products/edgescape.html.)

New Jersey's gain notwithstanding, both Georgia and Washington posted minor gains, adding 0.01 unique IPs per capita each. Illinois' level remained consistent, while Missouri shed 0.04 unique IPs per capita since the second quarter. Among the other states within the top 10, Colorado, Utah, Rhode Island, and Arizona all saw increased levels of Internet penetration, while Massachusetts' level declined quarter-over-quarter.



	State	Unique IPs per Capita
1	New Jersey	1.09
2	Georgia	0.71
3	Washington	0.63
4	Illinois	0.57
5	Missouri	0.53
6	Colorado	0.47
7	Massachusetts	0.46
8	Utah	0.46
9	Rhode Island	0.45
10	Arizona	0.44

Figure 5: Internet Penetration in the United States

SECTION 4: Geography

Through its globally deployed server network and by virtue of the billions of requests for Web content that it services on a daily basis, Akamai has a unique level of visibility into the connection speeds of the systems issuing the requests, and as such, of broadband adoption around the globe. Because Akamai has implemented a distributed network model, deploying servers with-in edge networks, it can deliver content more reliably and more consistently at those speeds, in contrast to centralized competitors 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.[5]

The data presented within this section was collected during the third quarter of 2009 through Akamai's globally-deployed server network and includes all countries and U.S. states that had more than 1,000 average monthly unique IP addresses make requests to Akamai's network during the second quarter. For purposes of classification in this report, the "broadband" data included below is for connections greater than 2 Mbps, and "high broadband" is for connections of 5 Mbps or greater. In contrast, the "narrowband" data included below is for connections slower than 256 Kbps. Note that the percentage changes reflected below are not additive — they are relative to the prior quarter(s). (That is, a Q2 value of 50% and a Q3 value of 51% would be reflected here as a 2% change.) A quarter-over-quarter change is shown within the tables in several sections below in an effort to highlight general trends. A year-over-year change is also shown in some tables in an effort to highlight longer-term trends.

As the quantity of HD-quality media increases over time, and the consumption of that media increases, end users are likely to require ever-increasing amounts of bandwidth. A connection speed of 2 Mbps is arguably sufficient for standard-definition TV-quality video content, and 5 Mbps for standard-definition DVD-quality video content, while Blu-Ray (1080p) video content has a maximum video bit rate of 40 Mbps, according to the Blu-Ray FAQ.[6] As we have done in prior quarters, in order to provide additional insight into where users have connection speeds that would allow them to be able to effectively consume this higher quality media, we will continue to examine how the "high broadband" connections are distributed across speed groupings ranging from 5 to >25 Mbps. In addition, starting this quarter, we will begin looking at which cities around the world have the highest average measured connection speeds, and the highest levels of high broadband and broadband adoption.

SECTION 4: Geography (continued)

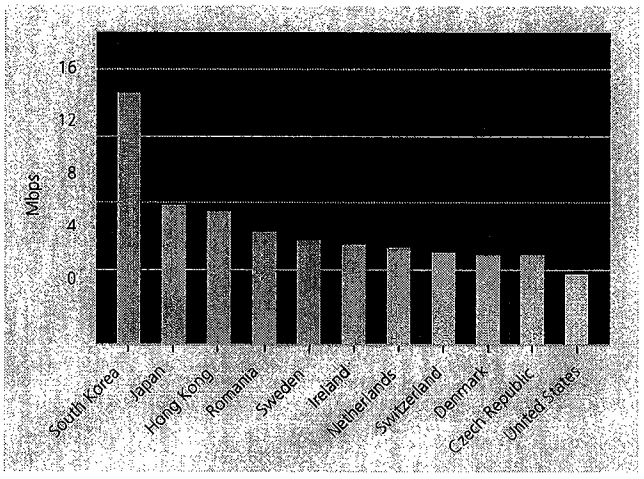
4.1 Global Average Connection Speeds

On a global basis, the average connection speed increased by approximately 18%, and more than 100 countries had average connection speeds under 1 Mbps.

Examining the global average measured connection speed data for the third quarter of 2009, we see that the quarterly changes were fairly mixed, with some countries in the top 10 seeing increases of more than ten percent, while several others remained essentially flat or saw a minor decrease. Current highlights and historical trends for average connection speeds on a global basis can be found in Akamai's "Broadband Adoption Trends" data visualization tool, available at http://www.akamai.com/dv5.

As highlighted in Figure 6, the global average connection speed is once again increasing, after an unusual drop in the second quarter. The average connection speed of 1.7 Mbps returns it to a level consistent with the first quarter of 2009. South Korea maintained its position as the country with the highest average connection speed, and was joined by Ireland as one of two countries in the top 10 posting quarterly gains of greater than 25% (on top of minor quarterly gains also seen in the second quarter). Romania, Sweden, and the Czech Republic all saw quarterly declines in their average connection speeds, though they all maintained positive yearly growth. While the United States saw a small quarterly gain in average connection speeds, increasing to 3.9 Mbps, from a year-over-year perspective, the trend is negative, though just slightly so.

During the third quarter, 103 countries had average connection speeds below 1 Mbps, down from 125 countries in the prior quarter. Akamai measured average connection speeds below 100 Kbps in seven countries during the third quarter – half as many as last quarter. (Note that the slowest countries often have the smallest number of unique IP addresses connecting to Akamai, so it may be that case that more countries fell below the 1000 unique IP threshold in the third quarter than in the second quarter.) The lowest average connection speed seen in the third quarter was in Mayotte, at 43 Kbps. (The speed is consistent with the second quarter's slowest country, Eritrea, which fell below the 1000 unique IP threshold in the third quarter.)



Country	Q3 09 Mbps	Q2–Q3 Change	YoY Change
- Global	1.7	18%	13%
1 South Korea	14.6	29%	16%
2 Japan	7.9	8.2%	11%
3 Hong Kong	7.6	10%	13%
4 Romania	6.2	0.1%	12%
5 Sweden	5.7	-5.0%	-6.2%
6 Ireland	5.3	26%	73%
7 Netherlands	5.2	2.2%	18%
8 Switzerland	5.0	-	1.0%
9 Denmark	4.8	1.6%	7.7%
10 Czech Republic	4.8	3.1%	23%
...			
18 United States	3.9	1.8%	-2.4%

Figure 6: Average Measured Connection Speed by Country

4.2 Global Average Connection Speeds, City View

For the first time in Akamai's *State of the Internet* report, we are examining average measured connection speeds at an even more granular level, looking at the top 10 fastest cities per continent/region for the third quarter of 2009. One thing that becomes clear almost immediately upon looking at the data, as shown in Figure 7, is that a number of cities around the world have access to particularly high-speed connectivity – in Asia, Europe, and North America, even the slowest cities in the top 10 saw measured speeds in excess of 10 Mbps. Similarly, it shows gaps in the apparent availability of high speed connectivity, where the top average measured speeds from cities in Africa, Oceania, and South America were unable to break the 4 Mbps mark.

REGION	CITY	Q3 09 KBPS
Africa		
Morocco	Rabat	3251
Tunisia	Tunis	2211
Morocco	Casablanca	2030
South Africa	Midrand	1542
South Africa	Sandton	1283
South Africa	Capetown	1257
Mauritius	Port Louis	1193
Réunion	Leport	1138
South Africa	Johannesburg	1087
South Africa	Mpumalanga	1035
Asia		
Israel	Beersheva	25184
Hong Kong	Kowloontong	20323
Hong Kong	Saikung	19288
Taiwan	Taoyuan	18585
South Korea	Masan	17759
South Korea	Iksan	17315
South Korea	Koyang	15915
South Korea	Seocho	15563
South Korea	Poryong	15486
South Korea	Ilsan	15189
Europe		
Switzerland	Lausanne	24767
Slovakia	Presov	14267
Belgium	Gent	14072
Slovakia	Zilina	14032
Belgium	Namur	13690
Denmark	Lyngby	13024
Czech Republic	Olomouc	12970
Slovakia	Kosice	12464
Finland	Turku	11856
Slovakia	Banskabystrica	11751

REGION	CITY	Q3 09 KBPS
North America		
United States	Sandy, UT	33464
United States	Iowa City, IA	27381
United States	Norman, OK	26793
United States	Logan, UT	26717
United States	Clemson, SC	22775
United States	Charlottesville, VA	20948
United States	Spanish Fork, UT	17964
United States	Storrs Mansfield, CT	17710
United States	Gorham, ME	17591
United States	Kingston, RI	17093
Oceania		
New Zealand	Wellington	3488
Australia	Riverwood	3204
New Zealand	Hamilton	3163
Australia	Canberra	2990
New Zealand	Christchurch	2886
Australia	Sydney	2660
New Zealand	Tasman	2653
New Zealand	Auckland	2637
Australia	Adelaide	2234
Australia	Brisbane	2132
South America		
Colombia	Cucuta	2402
Chile	Valparaiso	2264
Chile	Santiago	2250
Brazil	Curitiba	1928
Brazil	Florianopolis	1718
Brazil	Campinas	1629
Brazil	Belo Horizonte	1622
Colombia	Bogota	1592
Chile	Concepcion	1573
Colombia	Pereira	1565

Figure 7: Average Measured Connection Speed, Top Cities by Region

SECTION 4: Geography (continued)

It is interesting to note that although South Korea continued to hold the top spot as the country with the highest average measured connection speed at 14.6 Mbps, its fastest city (Masan) was ranked fifth among Asian cities, at approximately 1.2x the country average. Some interesting clustering patterns appear as well when the data is viewed at this level of granularity:

- South Africa has half of the top 10 fastest cities in Africa, with average speeds ranging between 1-1.5 Mbps.
- South Korea, unsurprisingly, has six of the top 10 fastest cities in Asia, all with average speeds above 15 Mbps.
- Slovakia has four of the top 10 fastest cities in Europe, with average speeds between 11-14 Mbps.
- Some of the fastest cities in the United States are in states in the Southwest (Utah & Oklahoma) and New England (Connecticut, Maine, Rhode Island).
- Brazil has four of the top 10 fastest cities in South America, with average speeds between 1.6-1.9 Mbps.

Similar to the explanation above in Section 3.3, the city/country/region classifications within this section are derived from Akamai's EdgeScape database.

4.3 United States Average Connection Speeds

Quarterly changes in average measured connection speeds within the United States were mixed in the third quarter, as illustrated in Figure 8. Three states and the District of Columbia saw speeds increase 15% or more, while New Hampshire and New York saw nominal decreases. Among the top 10 states, Massachusetts has seen the greatest yearly increase in average measured connection speed, growing 21%. In contrast, New Hampshire's average of 5.9 Mbps is 10% slower than in the third quarter of 2008.

Overall, 25 states saw average connection speeds decline in the third quarter – Kentucky shed 41%, while Nevada dropped just 0.3%, which was enough to push them out of being one of the top 10 fastest states. Quarterly increases seen by the other half of the states ranged from a minor 0.3% gain by Iowa to Massachusetts' 20% increase. Comparing average connection speeds year-over-year, 25 states saw speeds decline (up from only 10 in the second quarter), from New Jersey's 39% drop

State	Q3 09 Mbps	Q2–Q3 Change	YoY Change
1. Delaware	7.2	15%	-1.2%
2. New Hampshire	5.9	7.4%	-10%
3. Massachusetts	5.9	20%	21%
4. Vermont	5.7	5.2%	0.2%
5. Rhode Island	5.6	3.2%	-2.1%
6. New York	5.5	-2.2%	-
7. Connecticut	5.5	4.4%	4.0%
8. District Of Columbia	5.3	16%	0.5%
9. Maine	5.2	0.9%	7.3%
10. Utah	5.2	16%	3.9%

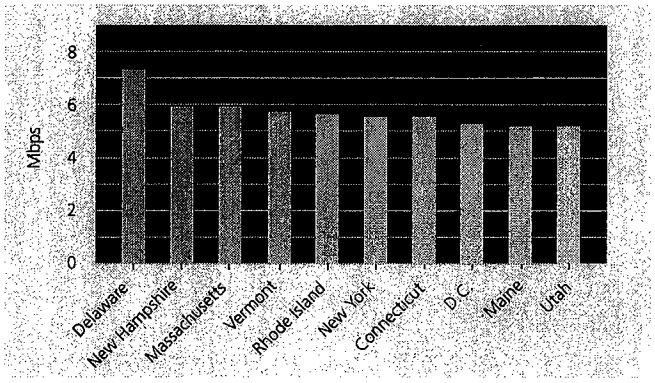


Figure 8 Average Measured Connection Speed by State

to South Carolina's barely perceptible 0.1% loss. New York saw no change year-over-year, and growth in the remaining states ranged from a 0.2% increase in Vermont to Hawaii's impressive 40% increase in average measured connection speeds. (Note that New Jersey's significant quarterly and yearly changes may be related to the reclassification of IP blocks within Akamai's EdgeScape database, as described above in Section 3.3.)

4.4 Global High Broadband Connectivity

Once again, in the third quarter of 2009, 19% of the Internet connections around the world were at speeds greater than 5 Mbps. This level was fairly consistent with the prior quarter, as well as compared to the same period a year ago.

South Korea continues to dominate the list, posting quarterly growth approaching seven percent, closing in on having three-quarters of their connections to Akamai at high broadband speeds (above 5 Mbps). As shown in Figure 9, eight of the top 10 countries showed modest quarterly growth in their levels of high broadband connectivity, with only Romania and Denmark experiencing quarterly declines. All of the top 10 countries saw increased levels of high broadband adoption year-over-year, with Denmark growing by an impressive 76%, in spite of its third quarter decline. The United States, however, saw high broadband adoption rates decline slightly in the third quarter, losing 0.7%, while shedding a more concerning 8.8% year-over-year.

SECTION 4: Geography (continued)

Overall, 35 countries around the world saw increased quarterly levels of high broadband connectivity, and 49 countries saw yearly growth. In contrast, 41 countries saw quarterly declines, while 27 countries saw levels of high broadband connectivity decline year-over-year.

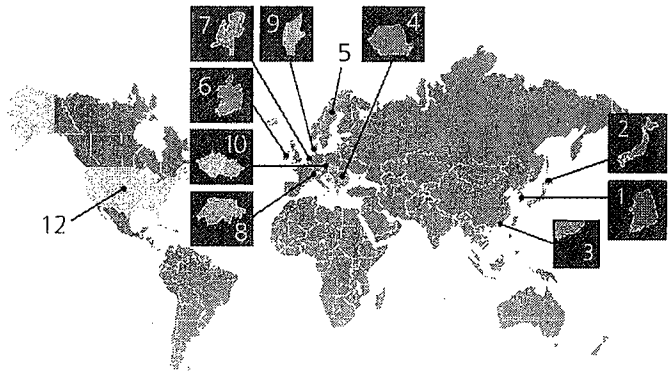


Figure 9: High Broadband Connectivity, Fastest Countries

Country	% above 5 Mbps	Q2-Q3 Change	YoY Change
- Global	19%	1.6%	1.5%
1 South Korea	74%	6.8%	28%
2 Japan	60%	8.0%	10%
3 Hong Kong	46%	3.6%	74%
4 Romania	42%	-1.9%	13%
5 Sweden	39%	2.0%	3.0%
6 Ireland	35%	3.2%	41%
7 Netherlands	33%	4.4%	23%
8 Switzerland	31%	1.0%	7.6%
9 Denmark	30%	-10%	76%
10 Czech Republic	25%	1.0%	4.3%
...			
12 United States	24%	-0.7%	-8.8%

The global level of high broadband penetration, shown in Figue 10, remained consistent quarter-over-quarter, remaining at 0.01 – that is, one high broadband IP per 100 people. Across the top 10 countries with the highest levels of high broadband penetration, eight countries saw quarterly increases, with the United States and Belgium remaining flat at a level of 0.09. Canada's increase to 0.08 moved it into the top 10, edging out Finland, which dropped to 11th for the third quarter.

Country	High Broadband IPs per Capita
- Global	0.01
1 South Korea	0.23
2 Sweden	0.18
3 Japan	0.15
4 Netherlands	0.14
5 Denmark	0.13
6 Hong Kong	0.12
7 Norway	0.11
8 United States	0.09
9 Belgium	0.09
10 Canada	0.08

Figure 10: Global High Broadband Penetration

4.5 Global High Broadband Connectivity, City View

Similar to Section 4.2, for the first time in Akamai's *State of the Internet* report, we are examining adoption of high broadband connectivity at an even more granular level, looking at the top 10 cities per continent/region with the highest percentages of connections to Akamai at speeds over 5 Mbps for the third quarter of 2009. Across Asia, Europe, and North America, we have seen strong rates of high broadband adoption with the top cities reaching adoption rates in the 80-90% range, as shown in Figure 11. However, the rates of adoption in Africa, Oceania, and South America were, as expected, much lower. In Africa, a single city reached greater than 25% adoption, while cities with under 1% adoption reached the top 10 for that region. The picture is better across Australia and New Zealand in the Oceania region, with the top 10 cities seeing high broadband adoption rates between 6-19%. Adoption rates in South America fell between Africa and Oceania, with the top 10 cities in the region showing adoption rates in the 1-6% range. Clearly, while users in some cities around the world enjoy an abundance of high speed connectivity, many other cities will need to invest in broadband infrastructure projects to provide the same levels of connectivity to their citizens.

REGION	CITY	% ABOVE 5 MBPS
Africa		
Morocco	Rabat	26%
Morocco	Casablanca	7.3%
South Africa	Midrand	4.2%
South Africa	Durban	3.8%
South Africa	Sandton	3.4%
Lesotho	Maseru	2.4%
Tunisia	Tunis	1.7%
South Africa	Johannesburg	1.3%
South Africa	Capetown	0.8%
Niger	Niamey	0.5%
Asia		
Israel	Beersheva	84%
South Korea	Masan	82%
Japan	Marunouchi	81%
South Korea	Seocho	80%
South Korea	Ilsan	80%
Japan	Hodogaya	79%
South Korea	Miliyang	77%
South Korea	Iksan	77%
South Korea	Kayang	77%
South Korea	Poryong	75%
Europe		
Hungary	Pecs	90%
Hungary	Miskolc	88%
Denmark	Lyngby	87%
Norway	Lysé	82%
Latvia	Ilguciems	82%
Hungary	Debrecen	76%
Switzerland	Lausanne	75%
Spain	Zaragoza	75%
Romania	Galati	75%
Slovakia	Presov	74%

REGION	CITY	% ABOVE 5 MBPS
North America		
United States	Iowa City, IA	92%
United States	Storrs Mansfield, CT	89%
United States	Kingston, RI	88%
United States	Norman, OK	87%
United States	Clemson, SC	87%
United States	Hanover, NH	86%
United States	Logan, UT	85%
United States	Chapel Hill, NC	84%
United States	Newark, DE	83%
United States	Henderson, NV	81%
Oceania		
Australia	Canberra	19%
New Zealand	Wellington	13%
New Zealand	Hamilton	12%
Australia	Sydney	9.9%
New Zealand	Palmerston North	8.9%
New Zealand	Christchurch	8.5%
Australia	Riverwood	8.0%
Australia	Melbourne	6.7%
Australia	Brisbane	6.1%
Australia	Adelaide	6.0%
South America		
Chile	Valparaiso	6.2%
Chile	Concepcion	5.5%
Brazil	Florianopolis	5.1%
Brazil	Curitiba	4.5%
Brazil	Campinas	3.4%
Brazil	Belo Horizonte	3.4%
Colombia	Cucuta	3.2%
Brazil	Portoalegre	2.8%
Chile	Santiago	2.7%
Brazil	Brasilia	1.2%

Figure 11: High Broadband Connectivity, Top Cities by Region

SECTION 4: Geography (continued)

4.6 Global High Broadband Connectivity: Speed Distribution

In an effort to better understand the distribution of connections at speeds above 5 Mbps around the world, Akamai has done a more detailed analysis on these connections in order to publish more detailed data on the distribution of connection speeds, aggregated into 5 Mbps 'buckets,' as seen in Figure 12.

As compared to the second quarter of 2009, South Korea saw a shift in the distribution of connections to higher speed buckets, with the 5-10 Mbps bucket declining from 35% to 29%, while the higher speed buckets all saw increases, with more than 10% of connections once again being made to Akamai at speeds greater than 25 Mbps. The increased percentages of extremely high speed connections are in line with South Korea's third quarter growth in both average measured connection speed and high broadband adoption rates.

While having a high broadband adoption rate that approaches just half of South Korea's, Hong Kong has the second highest levels of extremely high speed connectivity among the top 10 countries, with more than 2.5% of connections to Akamai at speeds between 20-25 Mbps, and more than 5% at speeds in excess of 25 Mbps. The distribution of connection speeds above 5 Mbps remained fairly flat in the United States between the second and third quarters, and the United States remained #12 globally for this metric.

Country	% above 5 Mbps	5-10 Mbps	10-15 Mbps	15-20 Mbps	20-25 Mbps	>25 Mbps
1 South Korea	74%	29%	15%	8.6%	5.7%	16%
2 Japan	60%	34%	17%	5.5%	2.0%	1.9%
3 Romania	46%	33%	7.9%	2.4%	1.1%	1.8%
4 Sweden	42%	31%	6.7%	2.2%	0.9%	1.6%
5 Hong Kong	39%	21%	6.6%	3.9%	2.6%	5.7%
6 Netherlands	35%	29%	3.7%	0.9%	0.4%	1.5%
7 Denmark	33%	29%	3.0%	0.7%	0.3%	0.4%
8 Belgium	31%	29%	1.2%	0.2%	0.1%	0.3%
9 Czech Republic	30%	25%	2.5%	0.9%	0.5%	1.4%
10 Latvia	25%	18%	3.8%	1.4%	0.7%	1.3%
...						
12 United States	24%	19%	2.3%	0.7%	0.4%	1.0%

Figure 12: High Broadband Connectivity, Distribution of Speeds

We expect that, on a global basis, as the adoption and rollout of DOCSIS 3.0 technology by cable Internet providers, as well as other FTTH initiatives by telecom providers, become more widespread that the percentage of connections in the higher speed 'buckets' will grow over time. (Of course, this assumes that these providers are pricing the highest speed service tiers at a level that subscribers find affordable.)

4.7 United States High Broadband Connectivity

In the third quarter of 2009, Delaware recorded an impressive 36% gain in the percentage of connections to Akamai at speeds over 5 Mbps, vaulting the state past New Hampshire to take the top spot among U.S. states with the highest levels of high broadband adoption. Massachusetts also saw a significant 21% gain in the third quarter, jumping into 5th place, up from 9th place in the second quarter. Overall, six of the top 10 states saw quarterly increases in their levels of high broadband adoption, while four saw nominal quarterly declines. As has frequently been the case in the past, East Coast states enjoy some of the highest levels of high broadband penetration, once again holding nine of the top 10 slots, as shown in Figure 13.

State	Unique IPs per Capita	Q2-Q3 Change	YoY Change
1 Delaware	63%	36%	11%
2 New Hampshire	53%	-5.7%	11%
3 New York	46%	-0.4%	3.3%
4 Vermont	45%	3.2%	-4.1%
5 Massachusetts	43%	21%	14%
6 Connecticut	40%	1.0%	-8.8%
7 Nevada	38%	2.8%	3.9%
8 District Of Columbia	37%	18%	0.8%
9 Maine	35%	2.7%	8.2%
10 Rhode Island	35%	-3.1%	-26%

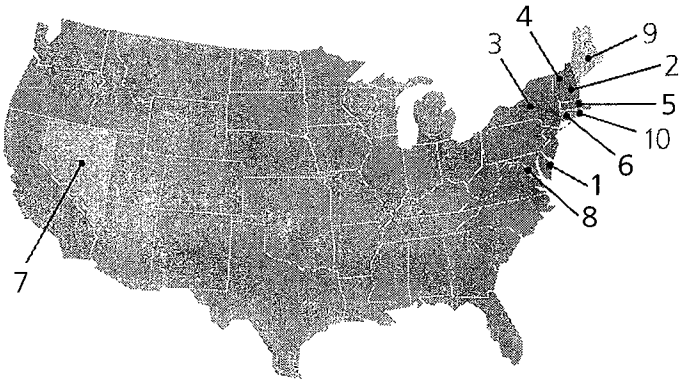


Figure 13: High Broadband Connectivity, Fastest U.S. States

Across the country, in the third quarter, 23 states and the District of Columbia saw quarterly increases in their levels of high broadband connectivity, ranging from a major 40% jump in South Dakota to a barely noticeable 0.5% increase in Ohio. While Florida remained flat quarter-over-quarter, 26 states saw a decline in their levels of high broadband connectivity, from New York's 0.4% loss to New Jersey's 50% loss. (As was noted in previous sections, this major change in New Jersey's metrics is likely related to the re-assignment of IP blocks to the state within Akamai's EdgeScape database.) Year-over-year, 20 states and the District of Columbia improved their levels of high broadband adoption; 30 states saw theirs get worse.

SECTION 4: Geography (continued)

Looking at the levels of high broadband penetration across the United States as calculated for the third quarter, shown in Figure 14, we see that penetration rates among the top 10 states remained fairly flat as compared to the second quarter, with three states showing minor increases, five states seeing no change, and two states declining.

State	High Broadband IPs per Capita
1 Massachusetts	0.20
2 New York	0.17
3 New Jersey	0.16
4 Rhode Island	0.16
5 Washington	0.14
6 New Hampshire	0.14
7 Maryland	0.13
8 Oregon	0.12
9 Georgia	0.12
10 Nevada	0.12

Figure 14: High Broadband Penetration in the United States

4.8 United States High Broadband Connectivity: Speed Distribution

In looking at the ten states with the highest levels of high broadband connectivity, we once again find that the distribution of connection speeds above 5 Mbps, as shown in Figure 15, generally follows a similar pattern. In each of the states, approximately 80-85% of the high broadband connections are at speeds between 5-10 Mbps. The 10-15 Mbps bucket encompasses another 8-10% of the high broadband connections, with the remainder primarily clustered between 15-20 Mbps or above 25 Mbps. We expect that as the adoption and rollout of DOCSIS 3.0 technology by cable Internet providers, as well as other FTTH initiatives by telecom providers, become more widespread that the percentage of connections in the higher speed 'buckets' will grow over time, and that providers are pricing the highest speed service tiers at a level that subscribers find affordable. In addition, as broadband stimulus funding is awarded and projects implemented, we expect that these numbers will likely grow in the future.

State	% above 5 Mbps	5-10 Mbps	10-15 Mbps	15-20 Mbps	20-25 Mbps	>25 Mbps
1 Delaware	63%	51%	5.7%	2.7%	1.5%	2.2%
2 New Hampshire	53%	46%	4.6%	1.2%	0.6%	1.0%
3 New York	46%	38%	4.8%	1.1%	0.5%	1.1%
4 Vermont	45%	36%	4.3%	1.7%	1.0%	1.5%
5 Massachusetts	43%	35%	4.5%	1.3%	0.7%	2.2%
6 Connecticut	40%	32%	4.1%	1.1%	0.7%	1.7%
7 Nevada	38%	30%	5.5%	1.2%	0.4%	0.9%
8 District Of Columbia	37%	27%	5.4%	1.7%	0.8%	2.0%
9 Maine	35%	30%	2.1%	0.9%	0.5%	1.6%
10 Rhode Island	35%	28%	2.8%	1.1%	0.6%	2.0%

Figure 15: High Broadband Connectivity, Distribution of Speeds

4.9 Global Broadband Connectivity

As shown in Figure 16, growth in broadband-level connections was essentially flat from a global perspective in the third quarter, with an anemic 0.1% quarterly increase. Among the top 10 countries, change was mixed, with five countries seeing growth, and the other five seeing a decline. While the levels of quarterly growth were fairly minor, and generally below the levels of growth seen by the top ten high broadband countries, one arguably positive note is that the five countries that saw a negative quarterly change had relatively minor losses, ranging from 0.1% to 5.4%. The level of broadband adoption in the United States remained relatively flat quarter-over-quarter, increasing less than 1%.

	Country	% above 2 Mbps	Q2–Q3 Change	YoY Change
-	Global	53%	0.1%	-7.6%
1	South Korea	94%	0.7%	2.1%
2	Switzerland	91%	0.3%	0.1%
3	Japan	90%	0.5%	-1.8%
4	Belgium	89%	-0.1%	-3.4%
5	Monaco	86%	-2.1%	-0.4%
6	Hong Kong	86%	-5.4%	-2.4%
7	Croatia	85%	3.3%	-.44%
8	Denmark	85%	2.4%	0.9%
9	Romania	84%	-2.0%	5.2%
10	Slovakia	84%	-0.5%	-3.8%
...				
35	United States	57%	0.6%	-11%

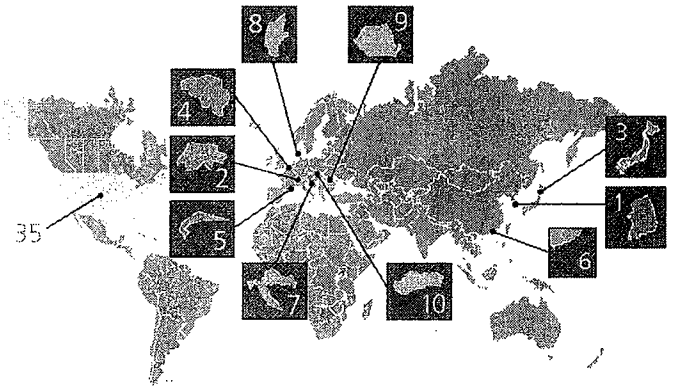


Figure 16: Broadband Connectivity, Fast Countries

South Korea, Switzerland, and Japan were among the fastest countries in the world, with 90% or more of their connections to Akamai at broadband levels. Hong Kong was part of this group in the second quarter, but its 5.4% quarterly decline dropped it to a (still very respectable) 86% of connections to Akamai at broadband levels. Globally, 53 countries increased their levels of broadband connectivity from the second quarter, while 59 countries did so year-over-year.

SECTION 4: Geography (continued)

Looking at the levels of broadband penetration around the world, as shown in Figure 17, we see that there was a generally positive trend. The global level increased from 0.02 to 0.03 broadband IPs per capita, and seven of the top ten countries saw increased levels of broadband penetration as compared to the second quarter. Switzerland and Belgium saw no change quarter-over-quarter, and among the top 10, only Monaco saw decreased broadband penetration. Broadband penetration in the United States increased quarter-over-quarter as well, growing from 0.21 to 0.23 broadband IPs per capita. Ideally, third quarter figures will represent the start of a longer-term positive trend, reversing the declines seen in the second quarter of 2009.

	Country	Broadband IPs per Capita
-	Global	0.03
1	Norway	0.34
2	Monaco	0.33
3	Denmark	0.33
4	Sweden	0.31
5	Netherlands	0.31
6	Iceland	0.30
7	South Korea	0.30
8	Germany	0.30
9	Switzerland	0.29
10	Belgium	0.26
...		
15	United States	0.23

Figure 17: Global Broadband Penetration

4.10 Global Broadband Connectivity, City View

Similar to Section 4.2, for the first time in Akamai's *State of the Internet* report, we are examining adoption of broadband connectivity at an even more granular level, looking at the top 10 cities per continent/region with the highest percentages of connections to Akamai at speeds over 2 Mbps for the third quarter of 2009. As can be seen clearly in the data presented in Figure 18, the top cities in Asia, Europe, and North America have near complete broadband adoption, with 95% or more of their connections to Akamai at speeds over 2 Mbps. Within Africa, there is a significant spread of adoption levels, with the top city seeing over 60% broadband adoption, while the 10th best city comes in just under 8%. Oceania also sees a broad spread across Australia and New Zealand, though the levels are, not surprisingly, comparatively better than those seen in the top 10 African cities. And, similar to the high broadband adoption data set, the level of broadband adoption seen in the top cities in South America falls between the levels seen in cities in Oceania and Africa.

REGION	CITY	% ABOVE 2 MBPS
Africa		
Morocco	Rabat	61%
Tunisia	Tunis	48%
Morocco	Casablanca	33%
South Africa	Capetown	13%
Lesotho	Maseru	12%
South Africa	Midrand	11%
South Africa	Durban	10%
Mauritius	Portlouis	8.9%
South Africa	Johannesburg	8.0%
South Africa	Pretoria	7.8%
Asia		
Japan	Marunouchi	98%
Japan	Hodogaya	98%
Israel	Beersheva	96%
South Korea	Masan	96%
Hong Kong	Hunghom	95%
South Korea	Milyang	95%
South Korea	Koyang	95%
South Korea	Iksan	95%
South Korea	Seocho	95%
South Korea	Chonju	95%
Europe		
Netherlands	Naaldwijk	99%
Portugal	Ferro	99%
Portugal	Moita	99%
Portugal	Palmela	99%
Czech Republic	Ceska	99%
Hungary	Pecs	98%
Portugal	Feira	98%
Portugal	Funchal	98%
Belgium	Marais	98%
Portugal	Aveiro	98%

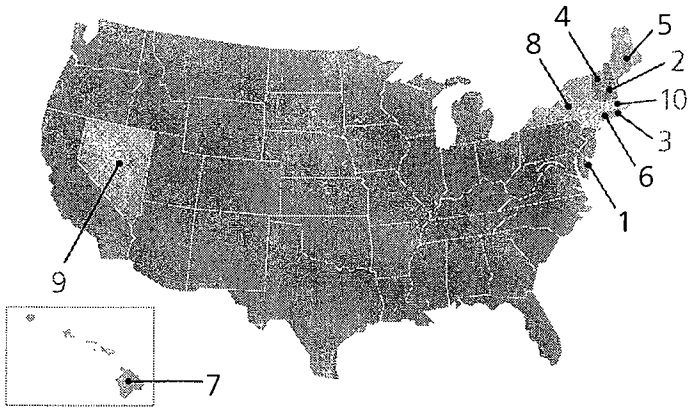
REGION	CITY	% ABOVE 2 MBPS
North America		
United States	Oakland, NJ	99%
United States	Capitol Heights, MD	99%
United States	Harrington, DE	99%
United States	Wallingford, PA	99%
United States	Smithfield, RI	98%
United States	Arvada, CO	98%
United States	Union, NJ	98%
United States	New Castle, DE	98%
United States	Owings Mills, MD	98%
Canada	Burlington, ON	98%
Oceania		
Australia	Riverwood	82%
New Zealand	Tasman	79%
New Zealand	Wellington	72%
New Zealand	Hamilton	58%
New Zealand	Auckland	58%
New Zealand	Christchurch	50%
Australia	Canberra	45%
Australia	Sydney	43%
Australia	Adelaide	43%
New Zealand	Palmerston North	35%
South America		
Colombia	Cucuta	55%
Chile	Santiago	51%
Chile	Valparaiso	38%
Brazil	Curitiba	35%
Brazil	Belo Horizonte	26%
Colombia	Bogota	26%
Colombia	Pereira	25%
Chile	Concepcion	20%
Colombia	Manizales	20%
Brazil	Porto Alegre	20%

Figure 18: Broadband Connectivity, Top Cities by Region

SECTION 4: Geography (continued)

4.11 United States Broadband Connectivity

In the third quarter of 2009, Delaware continued its march towards near complete broadband adoption, growing 1.1% to 97%. Six other states among the top 10 also experienced quarterly growth in broadband adoption, though aside from Massachusetts' surprising 20% gain, the increases were fairly muted, as shown in Figure 19. (And Massachusetts' gain enabled it to bump Oklahoma out of the top 10 list.) Three of the top ten states saw a quarterly decline, though all were relatively minor. While not all overwhelmingly positive, the changes seen in the third quarter were certainly an improvement over the prior quarter, when all of the top 10 states saw a decline in their levels of broadband adoption. Across the country, 28 states and the District of Columbia saw quarterly increases in broadband adoption levels, while 21 saw quarterly decreases. (The lone outlier was Washington State, which saw no movement quarter-over-quarter.) In looking at year-over-changes, however, the picture is not quite as rosy, as only 11 states grew, with 39 states and the District of Columbia declining.



State	% above 2 Mbps	Q2-Q3 Change	YoY Change
1 Delaware	97%	1.1%	0.2%
2 New Hampshire	88%	0.1%	0.2%
3 Rhode Island	85%	-0.2%	-2.4%
4 Vermont	83%	3.1%	1.6%
5 Maine	82%	0.6%	-2.6%
6 Connecticut	81%	-0.9%	-6.5%
7 Hawaii	79%	0.2%	2.3%
8 New York	78%	0.5%	-4.3%
9 Nevada	77%	-1.2%	-8.8%
10 Massachusetts	74%	20%	11%

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

In looking at the levels of broadband penetration across the United States as calculated for the third quarter of 2009, shown in Figure 20, we note that the penetration rates generally increased across the board, as compared to the second quarter. Of the top 10 states, only Washington saw no change quarter-over-quarter. These increased penetration rates are in line with the growth in broadband subscriber counts reported elsewhere. In *World Broadband Statistics Report – Q3 2009*,[7] research firm Point Topic notes that the United States added 1.66 million new broadband subscribers in the third quarter, amounting to approximately 2% growth in broadband penetration.

	State	Broadband IPs per Capita
1	Rhode Island	0.38
2	Massachusetts	0.34
3	New York	0.30
4	Georgia	0.29
5	South Dakota	0.28
6	Washington	0.27
7	New Jersey	0.27
8	Colorado	0.27
9	Hawaii	0.26
10	Nebraska	0.25

Figure 20: United States Broadband Penetration

4.12 Global Narrowband Connectivity

In looking at narrowband connectivity, in contrast to the high broadband and broadband rankings, quarterly and yearly declines are considered to be a positive trend, as it likely indicates that higher speed connectivity is becoming more widely available, and more widely adopted. However, while broadband adoption continues to increase in many countries across the world, many other countries are still stuck with low-speed Internet connections, with large percentages of their connections to Akamai occurring at speeds below 256 Kbps.

From a global perspective, narrowband adoption declined by nearly ten percent in the third quarter, reversing the unusual climb seen in the second quarter. However, on a yearly basis, the narrowband adoption rate grew just over a percent, as shown in Figure 21. Yearly increases were also seen among nine of the top 10 countries, though Ethiopia's loss of 0.2% barely qualifies as a notable decline. As compared to the second quarter, the results were mixed, with six of the top 10 countries seeing fewer narrowband connections to Akamai, and four seeing a larger number. On the bright side, the increases seen by those four countries were relatively minor, with Vanuatu's 1.2% increase the largest of the four. The United States once again shed narrowband connections, reversing the unusual 27% increase seen in the second quarter.

SECTION 4: Geography (continued)

Globally, 54 countries saw a quarterly increase in their percentage of narrowband connections, while 110 saw narrowband connection percentages decline. From a year-over-year perspective, the results were more mixed, with 77 countries seeing increases, and 87 seeing declines. The fact that more countries are seeing quarterly and yearly levels of narrowband connections decrease is a positive trend.

In line with the data shown in previous sections, the lowest percentages of narrowband connections in the third quarter were observed in Israel and South Korea, with 0.4% and 0.2% respectively. As shown in Figure 21, and consistent with prior quarters, many of the countries with the highest percentages of connections to Akamai at speeds below 256 Kbps were either island nations or on the African continent. In addition, Akamai sees comparatively few unique IP addresses from these countries, so their high percentage of narrowband connections is not entirely unexpected.

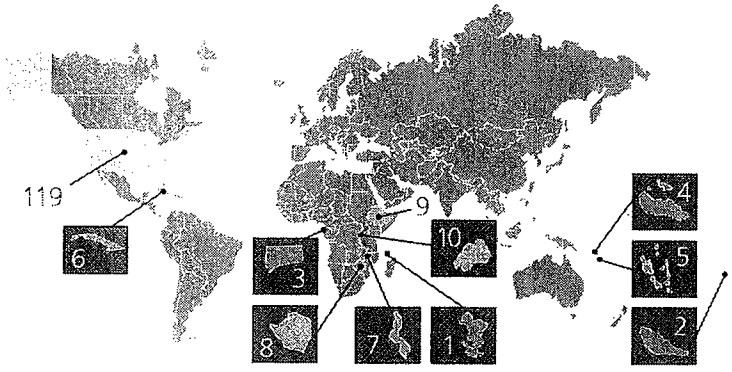


Figure 21: Narrowband Connectivity, Slowest Countries

Country	% below 256 Kbps	Q2-Q3 Change	YoY Change
- Global	5.1%	-9.3%	1.2%
1 Mayotte	99%	-0.1%	2.8%
2 Wallis And Futuna	99%	-1.1%	10%
3 Equitorial Guinea	99%	0.9%	4.8%
4 Solomon Islands	98%	0.6%	-12%
5 Vanuatu	97%	1.2%	8.3%
6 Cuba	95%	0.5%	4.1%
7 Malawi	95%	-2.4%	1.5%
8 Zimbabwe	95%	-1.5%	20%
9 Ethiopia	93%	-0.9%	-0.2%
10 Rwanda	93%	-1.2%	0.6%
119 United States	4.5%	-7.7%	-22%

4.13 United States Narrowband Connectivity

The District of Columbia once again had the highest percentage of narrowband connections in the third quarter as observed by Akamai. However, it did see a two percent decline on both a quarterly and yearly basis, which begins to make up for the unexpected significant increase seen in the second quarter. New Jersey's vault into the second place slot is likely an anomaly, related to the changes made to Akamai's EdgeScape database that were referenced in prior sections.

As shown in Figure 22, of the states in the top 10, five states and the District of Columbia saw quarterly decreases, with Ohio's the greatest at 12%. The other four states, including New Jersey, saw growth in their narrowband connection percentages. Kentucky's quarterly growth was unusually high as well, with Akamai observing 30% more narrowband connections than in the second quarter. Looking at yearly changes, New Jersey and Kentucky saw unusually large increases, and Ohio saw one percent growth, while the other seven states in the top 10 shed narrowband connections year-over-year.

	State	% below 256 Kbps	Q2-Q3 Change	YoY Change
1	District Of Columbia	9.8%	-2.0%	-2.0%
2	New Jersey	9.5%	71%	27%
3	Alaska	9.3%	-4.0%	-2.0%
4	Georgia	8.0%	-8.0%	-22%
5	Missouri	7.2%	-16%	-16%
6	Iowa	7.2%	-2.0%	-15%
7	Kentucky	5.9%	30%	51%
8	Texas	5.9%	1.0%	-19%
9	Ohio	5.7%	-12%	1.0%
10	Montana	5.6%	2.0%	-14%

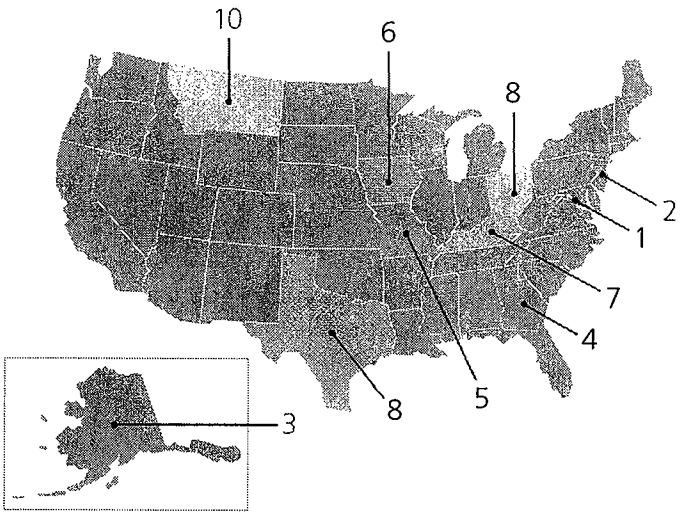


Figure 22: Narrowband Connectivity, Slowest U.S. States

Across the whole country, during the third quarter, 37 states and the District of Columbia had lower percentages of connections to Akamai at speeds below 256 Kbps than they did a quarter ago, while 43 states and the District of Columbia had lower percentages of connections to Akamai at speeds below 256 Kbps than they did a year ago. Washington State and Illinois have made the greatest progress on a yearly basis, losing 62% and 54% respectively.

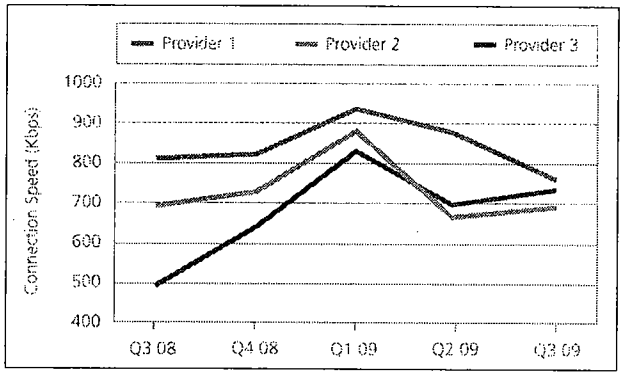
SECTION 5: Mobile

In response to the growing amount of Internet content being accessed through mobile devices such as smartphones and laptops equipped with mobile broadband connection technologies, and also in response to multiple inquiries for such data, starting with the *3rd Quarter, 2009 State of the Internet* report, Akamai will begin publishing insights into metrics collected from connections to Akamai that have been identified as coming from networks associated with mobile providers. Over time, the number of metrics and mobile providers examined here is expected to expand, but for the third quarter of 2009, we will look at average connection speeds from three of the leading mobile providers within the United States.

According to a report[8] published by Chetan Sharma Consulting, based on data collected from tests done across a number of major United States cities, average download speeds across the major United States mobile carriers ranged between 245 and 645 Kbps during a February to November 2009 test period. The connections to Akamai's network during the third quarter of 2009 came out much closer to the high end of the averages published in the Sharma report – in fact, all were higher.

Mobile Provider	Q3 09 Kbps	Q2-Q3 Change	YoY Change
1	690	1.6%	-0.4%
2	756	-14%	-6.2%
3	742	6.5%	49%

Figure 23: Average Measured Connection Speed by U.S. Mobile Provider



As shown in Figure 23, the average connection speeds observed across the three mobile carriers approached or exceeded 700 Kbps. The graph within Figure 23 illustrates that Akamai has observed significant variability in the average measured connection speeds for all three carriers over the last year. However, it appears that they may all be converging on average speeds in the 700-800 Kbps range. Unfortunately, since the International Telecommunications Union has not clearly defined data rates that users can expect from 3G equipment or providers, it is not possible to say how these speeds compare to defined expectations.

Both quarterly and yearly changes across the providers were mixed, though it appears that users of one particular provider clearly saw improved download speeds over the past year, likely related to investments made to increase capacity and coverage.

SECTION 6: Appendix

REGION	% ATTACK TRAFFIC	UNIQUE IP ADDRESSES	UNIQUE IPs PER CAPITA	AVG SPEED (KBPS)	% ABOVE 5 MBPS	HIGH BB IPs PER CAPITA	% ABOVE 2 MBPS	BB IPs PER CAPITA	% BELOW 256 KBPS
Europe									
Austria	0.3%	1,799,124	0.22	3759	20%	0.04	67%	0.15	1.2%
Belgium	0.1%	3,029,722	0.29	4441	31%	0.09	89%	0.26	0.7%
Czech Republic	0.2%	1,537,716	0.15	4756	30%	0.05	76%	0.12	1.5%
Denmark	0.2%	2,119,592	0.39	4763	33%	0.13	85%	0.33	0.9%
Finland	0.1%	2,174,246	0.41	3429	18%	0.07	47%	0.20	1.2%
France	1.2%	20,886,904	0.33	3283	11%	0.04	71%	0.23	0.7%
Germany	4.8%	29,741,416	0.36	3716	16%	0.06	82%	0.30	1.6%
Greece	0.2%	1,795,721	0.17	2871	5.9%	0.01	61%	0.10	3.0%
Iceland	0.0%	120,175	0.39	4169	18%	0.07	75%	0.30	--
Ireland	0.1%	1,055,267	0.25	5319	9.4%	0.02	46%	0.12	3.4%
Italy	5.4%	9,474,225	0.16	2540	3.1%	0.01	66%	0.11	2.7%
Luxembourg	0.0%	167,234	0.34	2427	3.8%	0.01	48%	0.17	1.9%
Netherlands	0.2%	6,711,996	0.40	5238	35%	0.14	77%	0.31	1.9%
Norway	0.0%	2,292,921	0.49	4200	22%	0.11	69%	0.34	1.8%
Portugal	0.8%	1,875,434	0.18	3578	17%	0.03	78%	0.14	0.9%
Spain	1.4%	10,414,031	0.26	2477	3.4%	0.01	55%	0.14	1.4%
Sweden	0.2%	3,777,149	0.42	5737	42%	0.18	75%	0.31	2.2%
Switzerland	0.2%	2,429,242	0.32	4953	19%	0.06	91%	0.29	0.9%
United Kingdom	1.6%	19,426,576	0.32	3483	19%	0.04	73%	0.23	1.2%
Asia/Pacific									
Australia	3.6%	7,689,027	0.37	2284	8.0%	0.03	37%	0.14	6.6%
China	6.5%	49,054,052	0.04	825	0.4%	<0.01	4.2%	0.00	9.3%
Hong Kong	0.2%	2,059,632	0.29	7637	38%	0.12	86%	0.25	1.4%
India	3.4%	3,343,157	<0.01	879	0.7%	<0.01	4.9%	0.00	26%
Japan	3.0%	31,654,696	0.25	7920	60%	0.15	90%	0.22	1.6%
Malaysia	1.3%	1,129,332	0.04	818	0.6%	<0.01	2.5%	0.00	12%
New Zealand	0.2%	1,207,301	0.29	2666	5.5%	0.02	58%	0.17	7.4%
Singapore	0.4%	1,497,703	0.33	2615	11%	0.04	49%	0.16	6.4%
South Korea	2.5%	15,301,708	0.32	14581	74	0.23	94%	0.30	0.2%
Taiwan	5.1%	5,814,084	0.25	4483	18%	0.05	63%	0.16	1.9%
Middle East									
Egypt	0.5%	830,986	0.01	552	0.1%	<0.01	1.9%	<0.01	18%
Israel	0.5%	1,651,378	0.23	2563	2.7%	0.01	47%	0.11	0.4%
Kuwait	0.2%	191,201	0.07	1444	4.4%	<0.01	19%	0.01	13%
Saudi Arabia	0.4%	1,130,232	0.04	1918	1.7%	<0.01	31%	0.01	1.3%
Sudan	0.0%	11,677	<0.01	346	<0.1%	<0.01	<0.1%	<0.01	35%
Syria	0.0%	26,655	<0.01	309	<0.1%	<0.01	<0.1%	<0.01	69%
United Arab Emirates (UAE)	0.2%	321,854	0.07	2156	11%	0.01	28%	0.02	15%
Latin & South America									
Argentina	3.6%	3,543,044	0.09	1063	0.3%	<0.01	5.0%	<0.01	9.2%
Brazil	8.6%	10,810,334	0.06	1085	1.4%	<0.01	11%	0.01	20%
Chile	0.5%	1,691,400	0.10	2216	2.6%	<0.01	49%	0.05	5.8%
Colombia	1.3%	1,974,170	0.04	1448	0.2%	<0.01	20%	0.01	5.2%
Mexico	0.4%	7,089,265	0.06	1045	0.2%	<0.01	5.1%	<0.01	3.3%
Peru	0.8%	632,558	0.02	784	<0.1%	<0.01	1.8%	<0.01	5.5%
Venezuela	0.3%	1,535,063	0.06	646	<0.1%	<0.01	0.8%	<0.01	11%
North America									
Canada	1.2%	11,158,133	0.33	4249	24%	0.08	77%	0.26	2.7%
United States	6.9%	119,197,651	0.40	3883	24%	0.09	57%	0.23	4.5%

SECTION 7: Endnotes

[1] http://www.cert.org/blogs/vuls/2009/03/conficker_how_many_are_there.html

[2] http://www.confickerworkinggroup.org/wiki/pmwiki.php/ANY/InfectionTracking

[3] http://www.census.gov/ipc/www/idb/tables.html, http://www.census.gov/ipc/www/popclockworld.html

[4] Ibid.

[5] http://www.akamai.com/dl/whitepapers/How_will_the_internet_scale.pdf

[6] http://www.blu-ray.com/faq/

[7] http://point-topic.com/content/operatorSource/dslreports/World%20Broadband%20Statistics%20Q3%202009.pdf

[8] http://www.chetansharma.com/State%20of%20the%20Broadband%20Nation%20-%20Chetan%20Sharma%20Consulting.pdf

Introducing Akamai's Internet Visualizer App for iPhone

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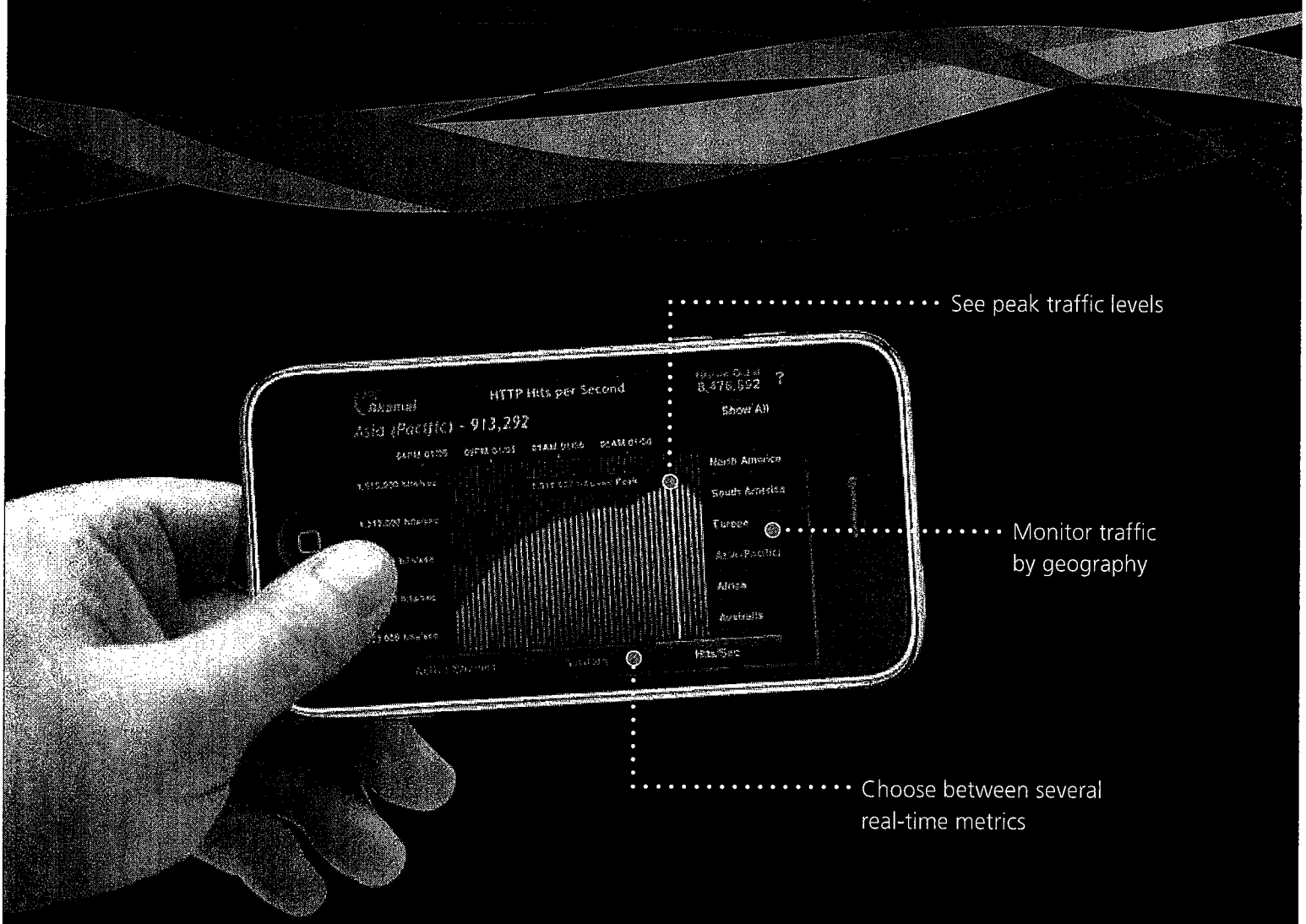

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