This visualization illustrates the extensive geographical scope and rich interconnectivity of nodes participating in the global Internet routing system, and compares snapshots of macroscopic connectivity in the IPv4 and IPv6 address space.

**Data Source** During a two-week period in January 2012, CAIDA researchers collected data using our distributed measurement infrastructure, Archipelago (A4). For the IPv4 map, 54 ASes are linked in 256 countries on 6 continents probed paths toward 192 million IPv4 prefixes. Using 23 A4-probed AS links, a path was probed in 254 countries on 6 continents concurrently probed toward 1.4 million IPv6 prefix addresses. These measurements covered 97% of the IPv4 routeable prefixes and 95% of the globally routeable IPv6 prefixes as seen in the Route Views Border Gateway Protocol (BGP) routing tables on January 2, 2012. We aggregated the captured IPv6-level data to construct IPv4 and IPv6 Internet connectivity graphs at the Autonomous System (AS) level. Each AS approximately corresponds to an Internet Service Provider (ISP). We map each observed IP address to the AS responsible for routing traffic to it, i.e., the origins (end-of-path) AS for the IPv4 prefix representing the best match for this address in the Route Views BGP routing table.

**Analysis** As in previous years, the IPv6 graph exhibited faster relative growth than the IPv4 graph. During a one-year period from January 2011 to January 2012, the number of IPv6 ASes increased by 35% and the number of links between them increased by 94%, while the IPv4 increased by 4% more ASes and 12% more links. (In This year, the IPv6 graph grew by 1.8K ASes and nearly 1K AS links, while the IPv4 graph added nearly 1K.9K ASes and 76K links.) While the IPv4 graph added nearly 1.9K ASes and 7.6K links, while the IPv4 graph added nearly 1.9K ASes and 7.6K links (in 2011). The three highest-frequency (most-connected) IPv6 ASes in our measurements remained in the same position as in 2011. There were more changes in rank among the most-connected IPv6 ASes where only the Hurricane Electric ranked 1st in 2011 remained on the top in 2012. This difference in stability is consistent with diverse traffic patterns and dynamic growth patterns.</p>

**Conclusion**

- The dynamic changes in node degrees (number of neighbors) provides additional insights into the Internet's evolutionary trends. This year's data is consistent with overall slower growth, but shows some dynamic changes in the AS ranks.
- The IPv6 graph showed more changes in rank among the most-connected ASes compared to the IPv4 graph, with Hurricane Electric remaining at the top in both years.
- Overall, the IPv6 network grew faster than the IPv4 network, with more ASes and links added in 2012 compared to 2011. This growth is expected as IPv6 adoption continues to increase globally.

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