CAIDA’s IPv4 & IPv6 AS Core
AS-level INTERNET GRAPH
Archipelago & Community Collected January 2008

This visualization represents macroscopic snapshots of the IPv4 and IPv6 internet topologies observed during the first week of January 2008. It simultaneously illustrates the peering richness of each topology and the worldwide distribution of nodes in each routing system.

The IPv4 data was collected between January 2nd and 17th, 2008, by the CAIDA’s IPv4 & IPv6 AS Core Archipelago & Community. It simultaneously illustrates the peering richness of each routing system.

The IPv6 data was collected between January 1st and 8th, 2008, by RIPE NCC and Route Views. For the IPv6 graph we used the IPv6 prefix traversal data of each AS by RIPE NCC on 1 January 2008.

We aggregated these network views to construct IPv4 and IPv6 Internet graphs at the Autonomous System (AS) level. Each AS approximately corresponds to an Internet Service Provider (ISP). We may collect multiple ASes with the same link color in the data, but we only show the outermost AS in the IPv4 graph. Each AS is subject to the origin (end-of-path) AS for the IP prefix representing the last hop of the prefix's path in the routing table.

To determine the longitude of ASes, we used the IPv6 BGP table from Route Views and mapped each AS to its set of announced IPv6 prefixes. We then calculated the longitude of each AS for the IPv6 graph using the following equations:

\[
\text{longitude} = \frac{1}{\text{size}} \times \sum_{i=1}^{\text{size}} \text{longitude}_i
\]

The position of each AS node is plotted in polar coordinates, with its latitude calculated using the following equation:

\[
\text{latitude} = \arctan \left( \frac{\text{y} - \text{yavg}} {\text{x} - \text{xavg}} \right) - \frac{\pi}{2}
\]

The IPv4 graph with ASes and link colors represents the Autonomous Systems in the IPv4 address space. The IPv6 graph with ASes and link colors represents the Autonomous Systems in the IPv6 address space.

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The graph displays the ASes involved in the routing of packets to the end-users of the Internet. Each node represents an Autonomous System (AS), and each link represents a PEERING relationship between two ASes.

The ASes are represented by their IP addresses, and the links between them are represented by their colors. The colors of the links correspond to the amount of traffic passing through them, with darker colors indicating higher traffic volumes.

The graph is a visualization of the Internet's AS-level topology at the beginning of 2008, illustrating the complexity and diversity of the Internet's routing infrastructure.