

# Is Internet traffic becoming less centralized over time?

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## ABSTRACT

Many worries about “network neutrality” are really worries about centralized control of the shared resource that is the Internet. If Internet traffic were decentralizing over time, then these worries should dissipate all on their own, without the need for any technological or political change. Computer scientists can aid this discussion by providing data. If one company could control 99% of Internet traffic, that would be very centralized. On the other hand, if a cabal of 100 companies couldn’t control more than 10% of Internet traffic, then that is less centralized. The boundary between “worry” and “don’t worry” will be different for every person, but now people can worry (or not!) based on data.

By downloading two snapshots of the Internet routing table we can compare how centralized traffic flow is in each snapshot. We follow the conventions of the networking community and call each entity that maintains their own network an autonomous system (AS). An AS can control traffic by being a source, a destination, or being in the middle of a traffic flow. Each AS has a certain number of IP addresses and a set of AS neighbors, and if we analogize that quantity with “mass”, and the number of inter-AS hops to “distance”, we get the gravity model of Internet traffic, which turns out to work pretty well in practice [2]. With the gravity model, CAIDA’s archived data [3], and a little algorithmic elbow grease [1], we can figure out how much traffic a cabal of ASes might control.

## BODY

*In 2002, 18 of 10000 ASes controlled 45% of Internet traffic. In 2010, 18 of 35000 controlled 45%. Internet traffic is not decentralizing.*

## REFERENCES

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[http://www.caida.org/data/active/ipv4\\_routed\\_topology\\_aslinks\\_dataset.xml](http://www.caida.org/data/active/ipv4_routed_topology_aslinks_dataset.xml).

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