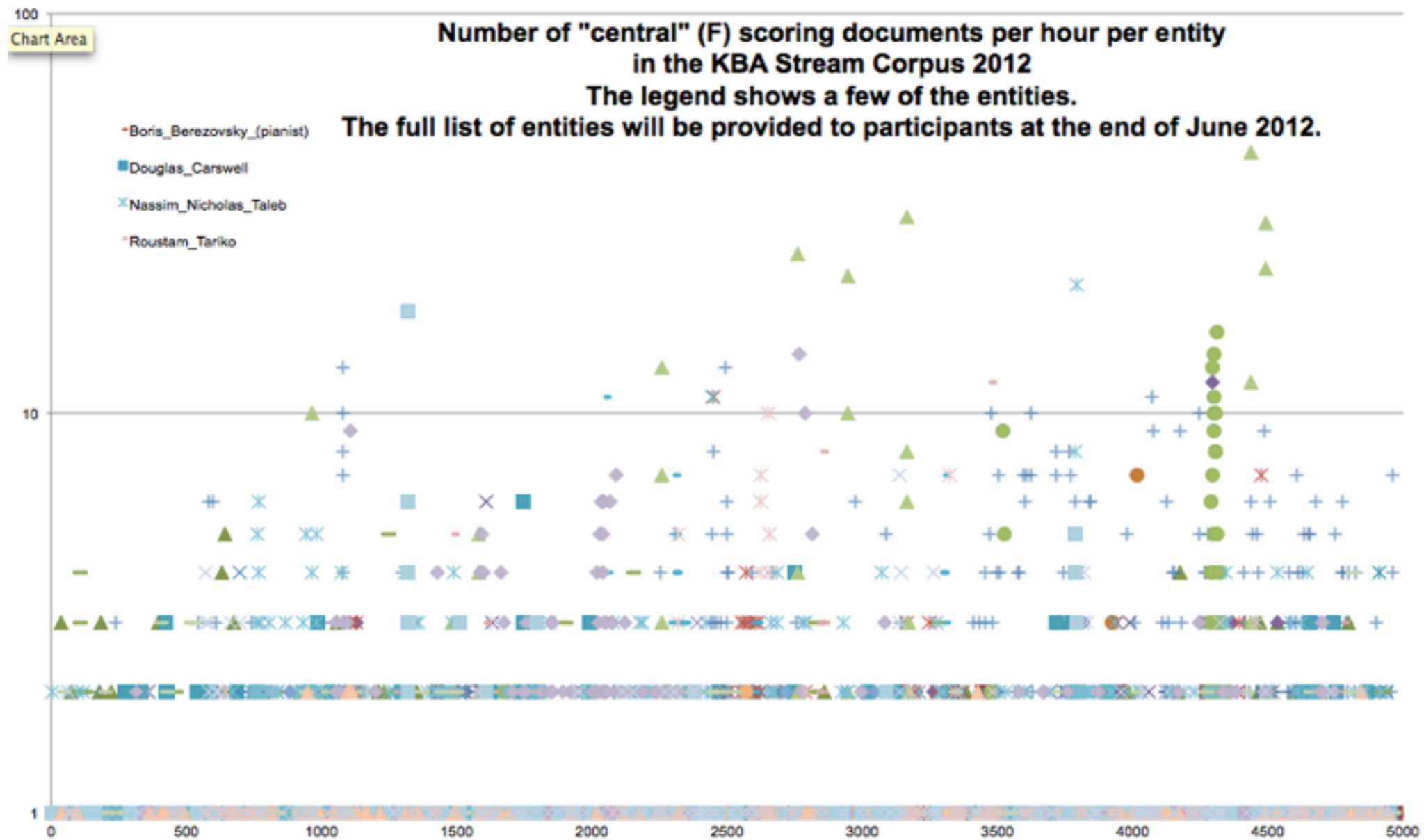
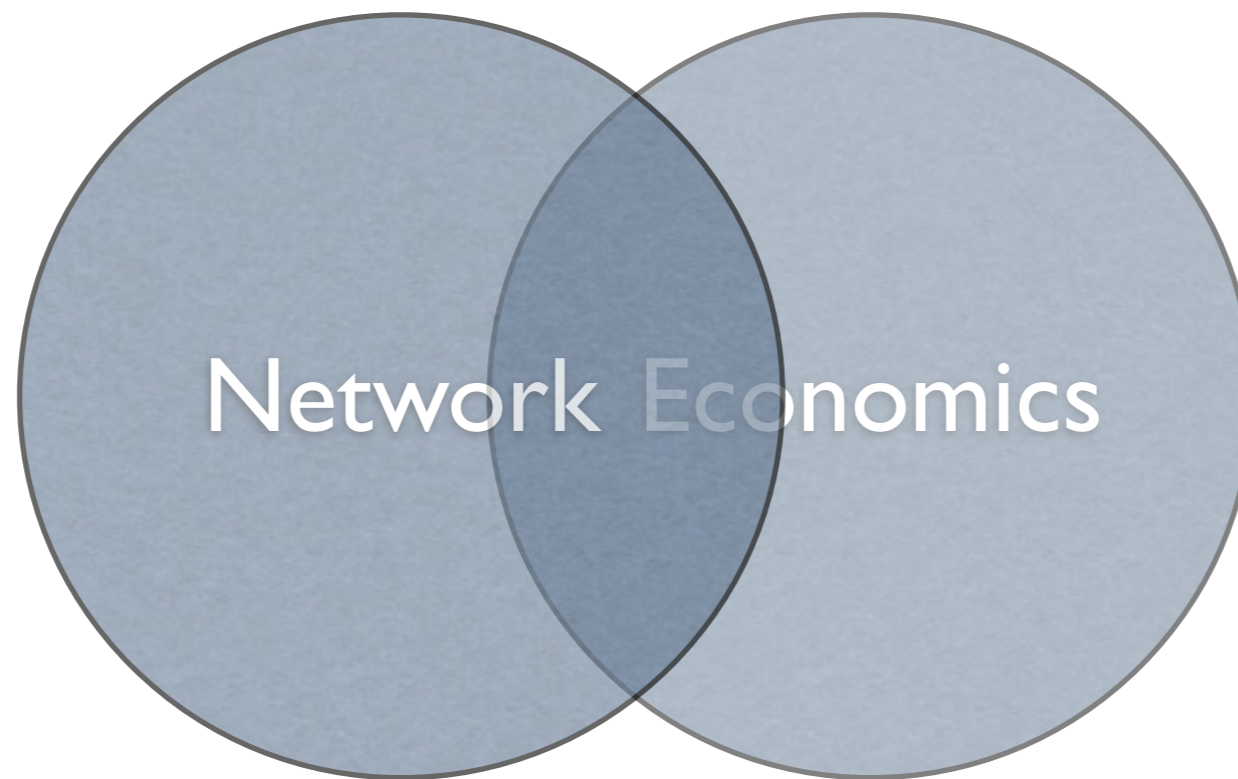


Economic and regulatory questions as drivers of IPv6 measurements and research

Steven Bauer
MIT

Economics dictated that I work on the following research project (which actually has some interesting connections to networking research)





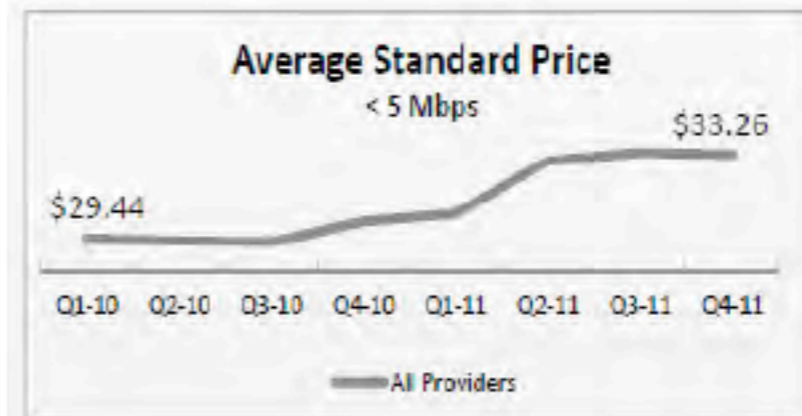
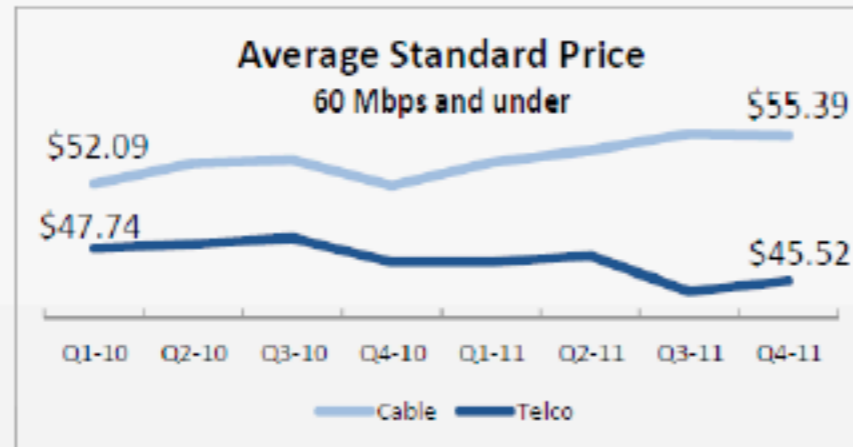
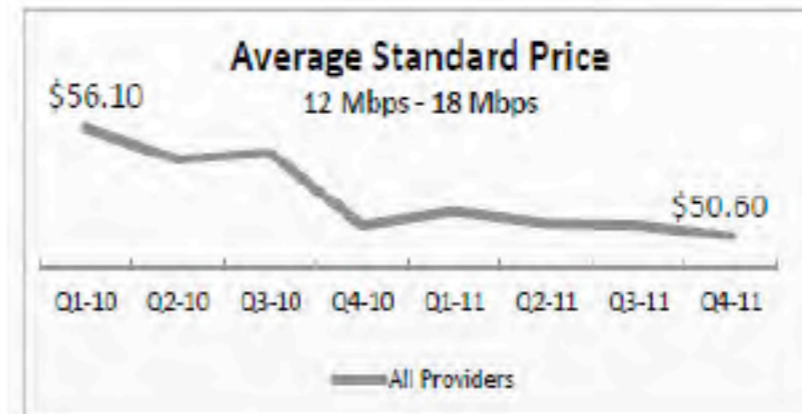
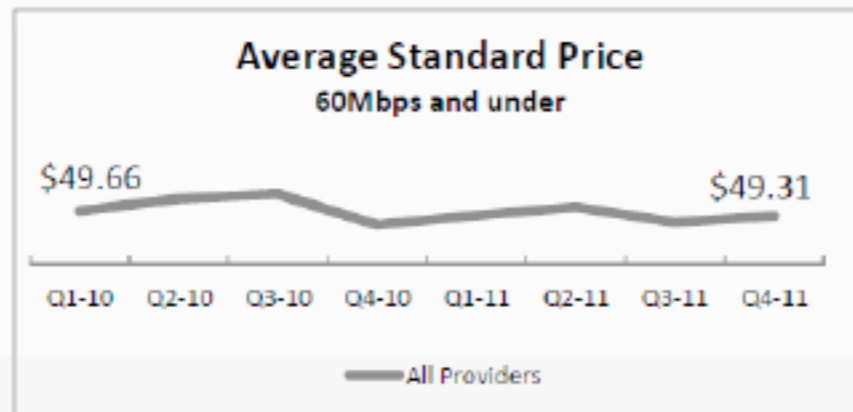


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How does IPv6 (or IPv4) performance measurements factor into economic/regulatory discussions?

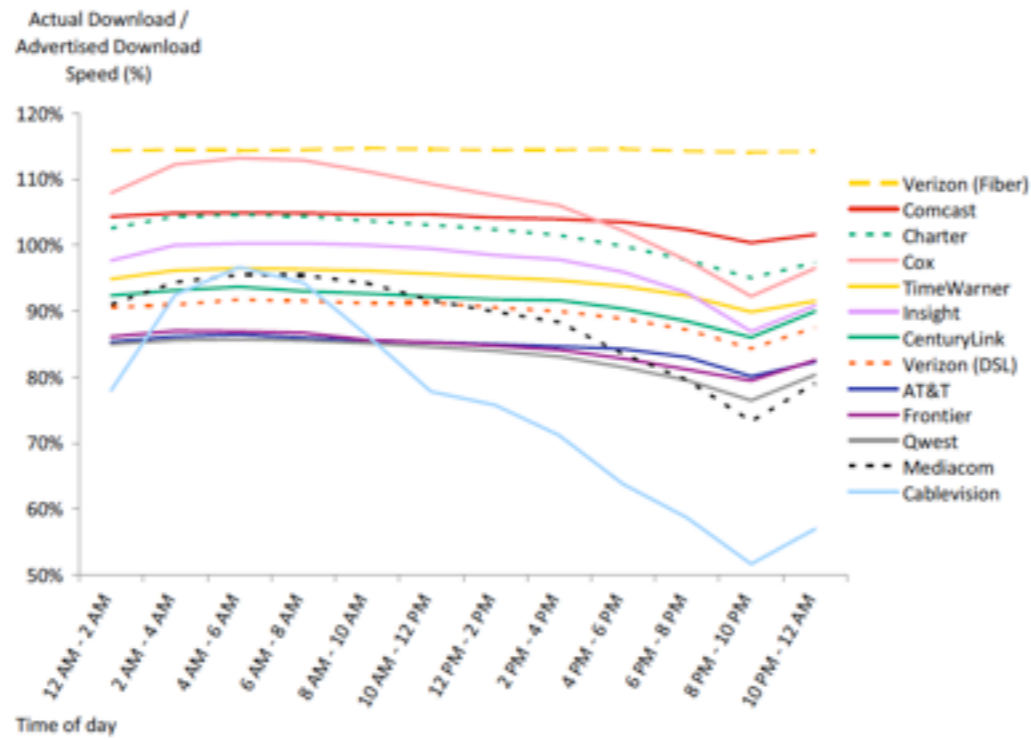
- Time series of pricing data
- Time series of performance data
- => Quality adjusted price indexes

Recent Trends in Broadband Pricing

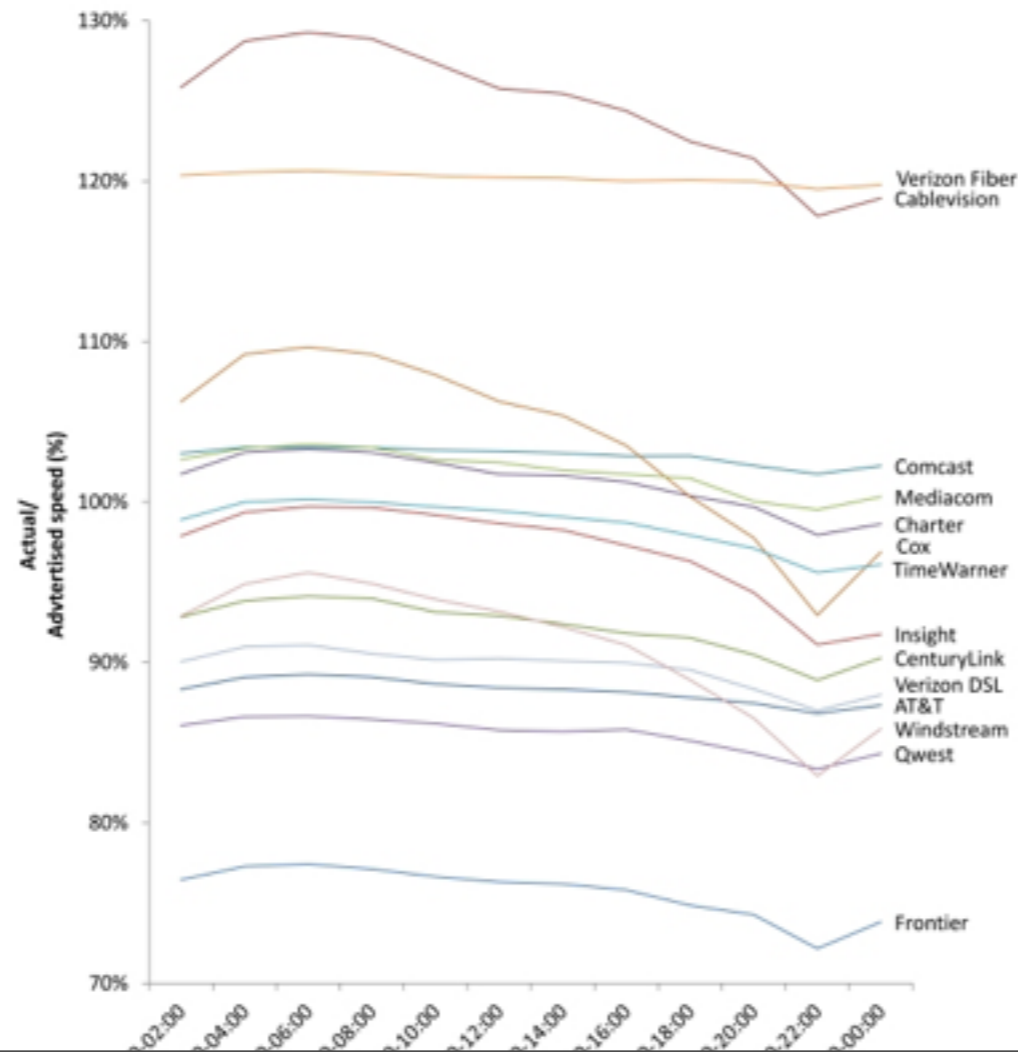


Source: P. Heimann and A. Woessner, Telogical Systems, "Trends in U.S. Consumer Broadband Pricing," presentation at Broadband Unlimited, CES 2012, January 2012.

Chart 11: Average sustained download speeds as a percentage of advertised over a 24-hour period, by provider



2011



2012

How to evaluate network quality in a world with a mixture of IPv4 and IPv6?

- In IPv4 space, we know “speed” measurements alone do not capture/quantify the user experience
- So how to both enrich performance characterization (in simple ways that are understandable to non-networking communities) and appropriately weight measures of IPv4 and IPv6?

Assessing market power in a mixed IPv4/IPv6 world

The Regulation of Internet Interconnection:
Assessing Network Market Power

by

Elisabeth M. Maida

B.S.E. Civil Engineering
Princeton University, 1998

Submitted to the Engineering Systems Division and the
Department of Electrical Engineering and Computer Science
in Partial Fulfillment of the Requirements for the Degrees of

Master of Science in Technology and Policy and
Master of Science in Electrical Engineering and Computer Science

at the
Massachusetts Institute of Technology

February 2013

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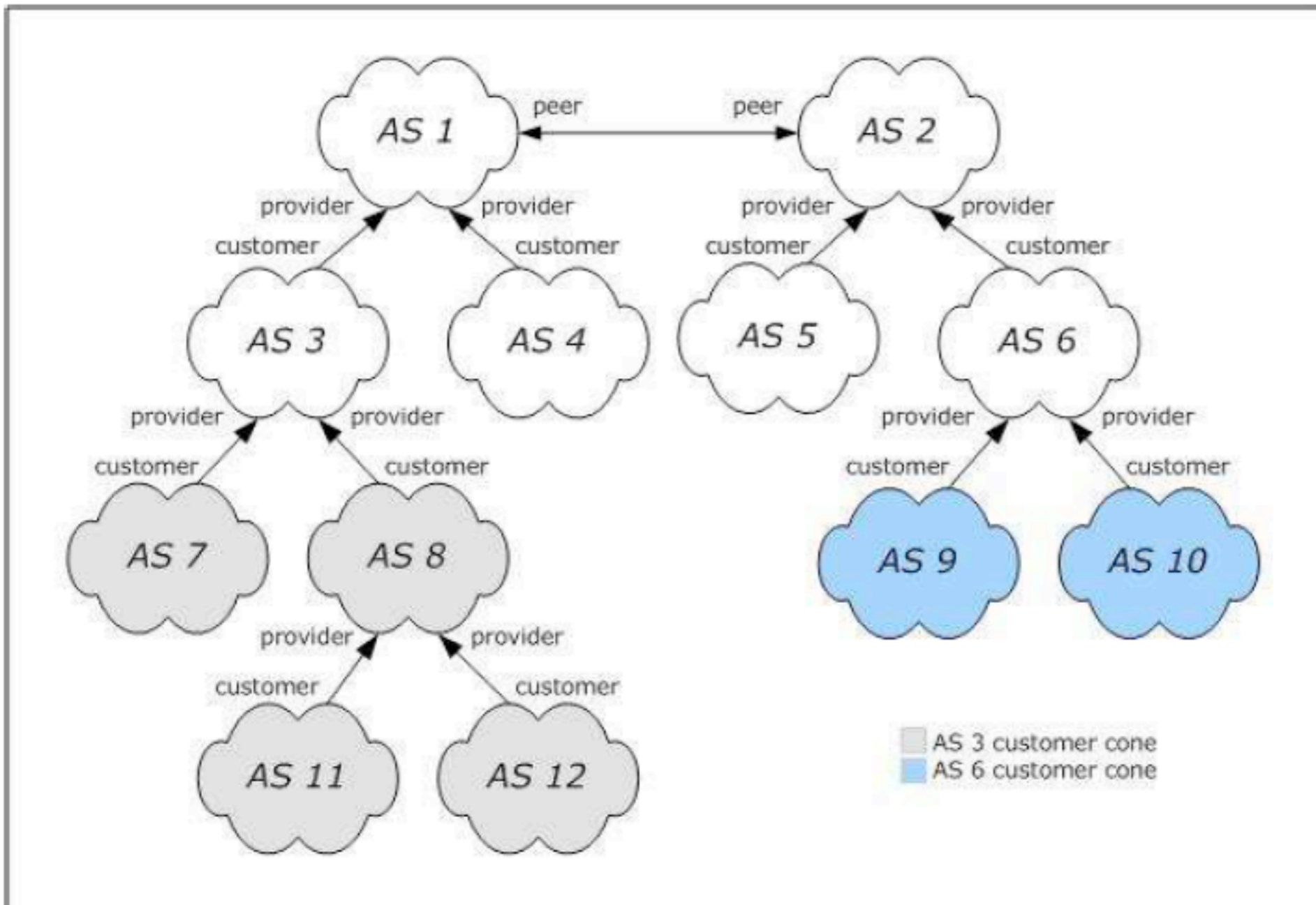


Figure 3. Example customer cone

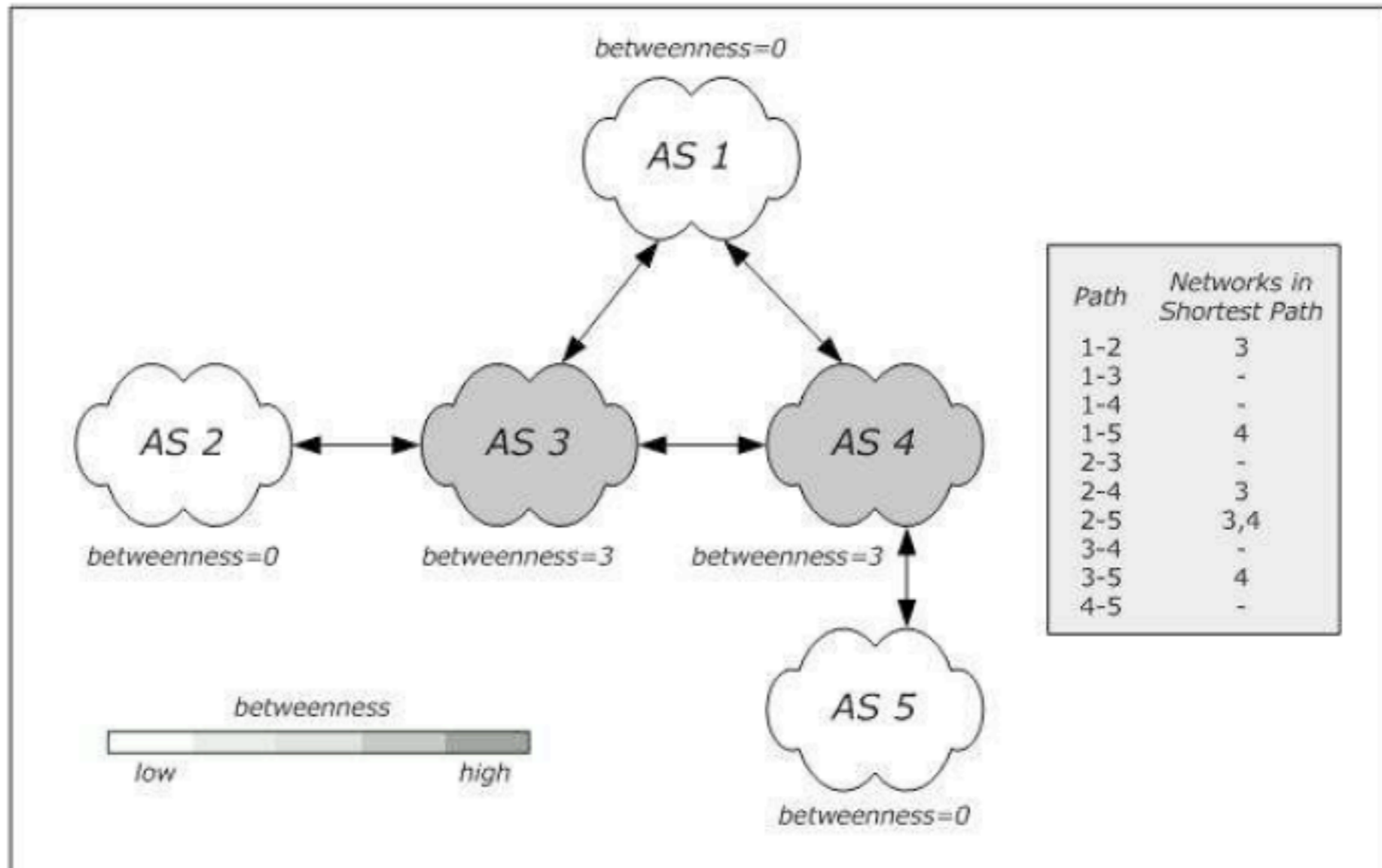


Figure 4. Sample betweenness calculation

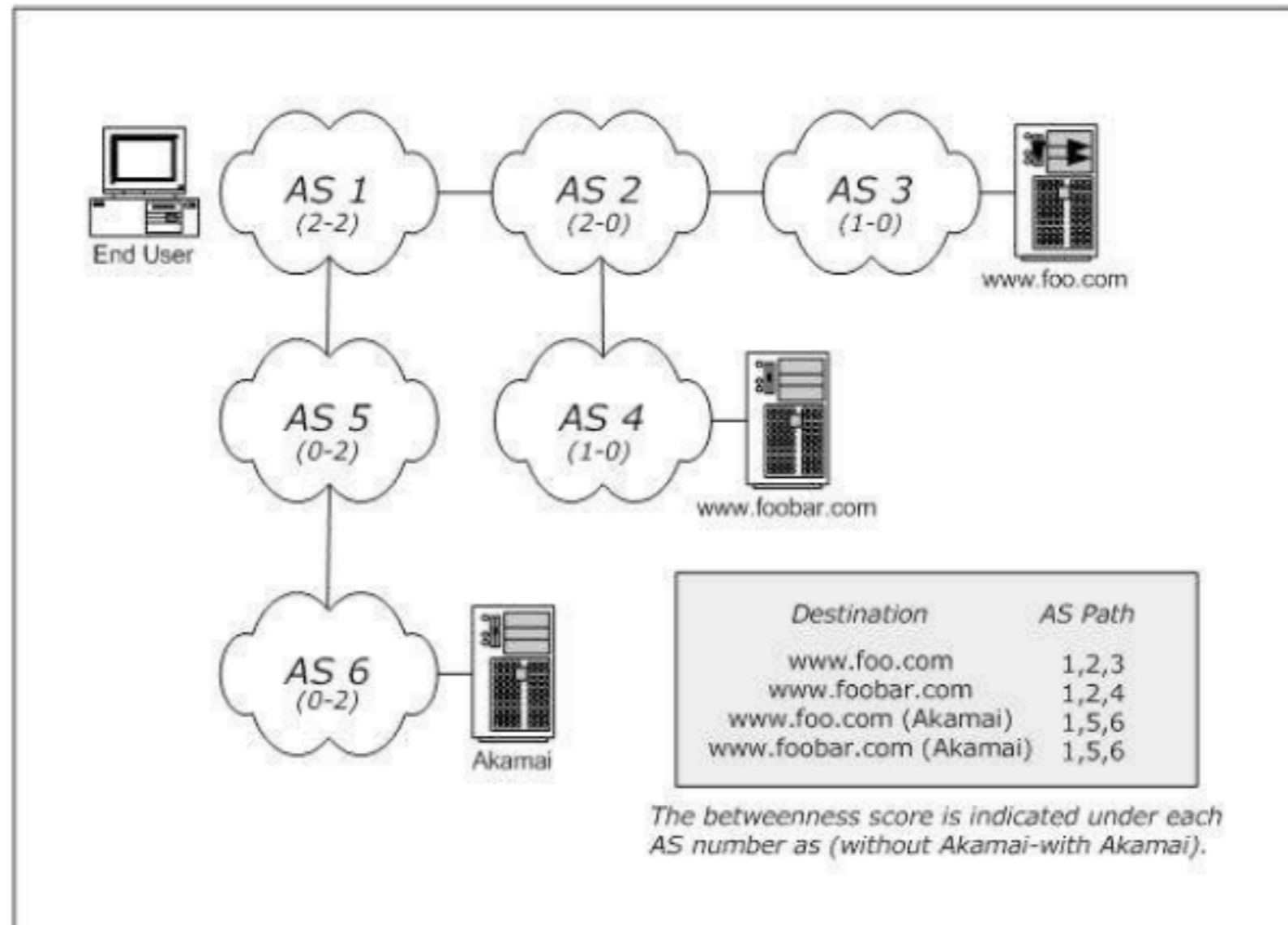


Figure 6. Betweenness Calculation Comparison

Maida recommendations for assessing market power of access networks

- Access variance:
 - If overall diversity of paths into a network is limited => look at interconnection requirements
 - If overall diversity of paths into a network is diverse => look at quality of those paths

How to evaluate market power in a world with a mixture of IPv4 and IPv6?

- Weighting assessments of IPv4 and IPv6 connectivity and path feasibility

M-Labs IPv6

- (Separate topic here, just reporting on this since I have looked at a good deal of M-labs data.)
- All servers now have IPv6
- Experiments run in slices that have IPv6 turned on when experiment in slice is IPv6 capable
- Npad and Neubot experiments currently running IPv6
- NDT IPv6 conversion in progress