

### Net Neutrality from a Public Enterprise Perspective

Most of the discussion of the proposed FCC changes in Net Neutrality has been from the perspective of the effect on consumers. Similarly, there have been many articles regarding the differences in perspective between that of technology and content providers versus that of Internet Service Providers. One voice that has historical significance and public importance is that of the education and research community. The Internet was invented and nurtured by these communities and the architecture, culture, and even the flaws were baked in as a result of their input. The principles of "Net Neutrality" were built in from the beginning and such a term would have, at that time, been meaningless.

Several fundamental principles originally articulated underlay the Internet, and these have sustained it and allowed it to scale to its current critical infrastructure status.

- 1) The Internet is vendor independent. To be either a provider or a consumer on the Internet one doesn't need to use the products of a particular vendor, one need only use products that conform to certain standards. Thus, there is a level playing field for vendors and ease of access for all Internet users.
- 2) There is an interdependence between content providers and transport carriers. They each depend on the other----no one would be interested in the Internet if there were nothing of value available in terms of services and content; similarly, the services and content would not be accessible if transport carriers didn't provide wide access. It is important that each recognize their mutual interdependence.
- 3) The Internet is a 'network of networks'. This principle has encouraged the growth of the Internet, which allows extension well beyond the service area of any particular local or regional carrier. Again, every carrier of traffic is interdependent on all other carriers in order to achieve end-to-end access worldwide. As the Internet has grown overall so has its value to all those who support it or are connected to it.

All of this adds up to the basic feature that no one entity owns the Internet. Many have a stake in its growth and value. However, that value comes from the contribution of a wide variety of stakeholders, and the balance that has developed could easily be destroyed if any single stakeholder group tries to use control of a critical component in an attempt to control the Internet per se.

Fast forward to the mid-1990's and the coming of the WWW, Internet commerce, and growth at 'Internet speed'. Universities and the research community not only took advantage of the evolution of the Internet to support their missions but they also created a next-generation Internet (Internet2) and enhanced their educational, public service, and research activities around networking-----expanding access, and lowering cost while maintaining, and even enhancing, quality. While universities and research enterprises have continued to maintain high performance private networks, their broad-based public services depend very much on the generally accessible public Internet. It is these services that proposed FCC changes in Net Neutrality may deteriorate to the detriment of the country as a whole.

How might this happen?

- 1) In the Internet era, education has moved from a classroom focused environment to a variety of network based instructional modalities, from fully online education to rethinking class time usage in more traditional settings. It is a bit overused, but truly learning has become anytime and anywhere due to the Internet. While this has allowed new entrants into the education marketplace, which can be beneficial, elimination of the level playing field created by Net Neutrality could allow ISPs in critical delivery areas to give preferential service to favored partners. This not only disadvantages educational institutions but also reduces access and choice for students.
- 2) Similarly, health care delivery has changed substantially in an open networked world. Sharing of health data among providers has added efficiency, immediacy, and convenience to patients and providers. Remote health care has offered improved services to under-served areas. Once again, deployment should be decided by health care

providers and done so on a level playing field. Infrastructure providers should not play a role in prioritization of network capabilities based on *their* preferred partners.

- 3) A large, and growing, mission of higher education is research, technology transfer, and innovation. Each of these could be negatively impacted by a degradation of Net Neutrality principles. Research is based on open communication, efficient and effective access to resources, and enquiry free of outside influences. This does not necessarily align with corporate interests. Research at higher education institutions has been a major economic driver since the Second World War, and there is every indication that this will continue into the future.
- 4) Technology transfer and innovation are concomitant aspects of research. Often these result in small start-up businesses with new ideas. A reduction of Net Neutrality, and potential prioritization on services for large partners, means that new incumbents into a marketplace could be at a structural disadvantage. Higher education institutions are factories for new ideas and services. The country depends on these for its future economic welfare. According to the Small Business Administration, small companies account for more than 60% of net new jobs and 46% of private nonfarm GDP, i.e., 46% of private sector output. However, in a network based world, these could be easily stifled by established businesses aligned with network providers.

Recognizing the historical and future importance to higher education in developing, sustaining, scaling, and using the Internet, the higher education community (including academic libraries) has published a set of Net Neutrality Principles (<http://er.educause.edu:81/blogs/2017/4/higher-ed-libraries-rerelease-net-neutrality-principles>) :

- Prohibit Blocking
- Protect Against Unreasonable Discrimination
- Prohibit Paid Prioritization
- Prevent Degradation
- Enable Reasonable Network Management
- Provide Transparency
- Continue Capacity Based Pricing of Broadband Internet Access
- Adopt Enforceable Policies
- Accommodate Public Safety
- Maintain Status Quo on Private Networks

While, these are basic principles, the higher education community recognizes that there may be multiple legal and administrative approaches to achieving them. While sustaining Net Neutrality as established in 2015 is one way to do this, the community has submitted an addendum to the recommendation referenced above to offer other paths that preserve the broadband needs of education on behalf of the well-being of the country. These are articulated in the blog posting at <http://er.educause.edu/blogs/2017/7/educause-higher-ed-support-net-neutrality>.

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