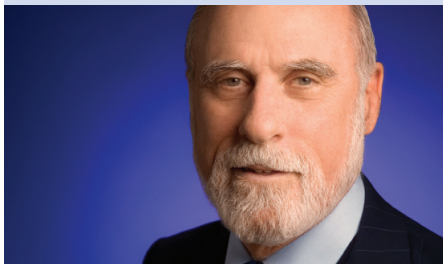


Regulate and deploy rationally

Vinton Cerf



On the regulatory front, let's look at broadband deployment and the regulatory frameworks that appear to have worked. Where regulation seems strong (for example, Australia, New Zealand, France, United Kingdom, Netherlands, Japan, Hong Kong, South Korea, and Singapore) we see very robust and very high speed wired and wireless Internet services available.

In the US, it has been a more mixed process. There is not a great deal of competition for broadband with at most two competitors, generally, for wired access. The FCC has been historically timid to regulate any aspect of Internet and while this has served the evolution of new Internet services well in the past, it is less clear that this stance has helped with regard to broadband deployment.

Among the concerns that some of us have is the possibility that a broadband access provider will use control over the medium to favor its own applications and services over those of others. One can see evidence of this where capacity is split between broadband Internet and video services with the bulk of the capacity devoted to the video services of the broadband provider.

An alternative formulation might have the entire capacity devoted to Internet-based services, including video. In fairness to these operators, video services represent a significant revenue stream and one can understand a business decision to

segregate capacity to assure dedicated service to this revenue stream. However, there is also some evidence in word and deed that some carriers might seek to favor their own Internet services over others either through deliberate interference with competing applications or by degrading services to them.

While only a few examples of such interference have surfaced, the threat generated a visible, noisy and controversial "net neutrality" movement. The FCC took very vigorous action against one broadband provider that used its ability to inspect packet content to interfere with the Bit Torrent application that tended to consume a lot of capacity. In the end, the carrier adopted a protocol-neutral capacity management tactic that struck me as more fair to consumers.

As the second decade of the 21st Century begins, I hope we will find a rational strategy for the deployment of broadband Internet access to all subscribers in the United States. The FCC is hard at work on this objective. Where we do not find adequate, facilities-based competition for subscribers, I believe we need a policy that assures non-discriminatory access to the Internet's resources. Consumer choice is an

attractive means for disciplining a market but where this isn't sufficient, regulatory mechanisms are needed to assure fair access to this resource that is growing in importance on a daily basis.

Regulatory mechanisms are needed ...

The IPv6 scenario

at least at the outset to assume global IPv6 connectivity, for example. As traffic levels increase, one can expect re-examination of IPv6 interconnection policies, mirroring those of the IPv4 world, but in the meantime, a fully-connected IPv6 platform can emerge, augmenting the preceding IPv4 era.

With regard to IPv6, there is no getting around the anticipated run-out of IPv4 address space and the need to introduce IPv6 virtually everywhere. Internet Service Providers, on the whole, appear

to be in denial although a few of them have made serious IPv6 commitments.

The run-out is anticipated in 2011 when the last IPv4 address space is expected to be assigned by the five regional Internet registries. As that moment approaches, there will be increasing turmoil in the IPv4 space, with people buying and selling chunks of address space leading to rapid growth in the routing tables and the potential that small address spaces will literally fall off the network (disappear from the routing tables for lack of space).

This would be an ugly denouement for the IPv4 Internet and for this reason I have been urging all ISPs, end users and application service providers to implement and deploy IPv6 in a timely and well-engineered fashion. Engineering in a crisis is a bad policy. I am proud of Google's progress in this area - we are well along in implementing IPv6 for all our services.

The big challenge is getting islands of IPv6 capability to interconnect on a liberal basis to assure full connectivity of the IPv6 Internet, comparable to the IPv4 connectivity that we enjoy today. It would be wise for ISPs to adopt a liberal peering policy

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