



**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of:)
)
Further Inquiry into Two Under-Developed) **GN Docket No. 09-191**
Issues in the Open Internet Proceeding) **WC Docket No. 07-52**
)

**REPLY COMMENTS OF
INFORMATION TECHNOLOGY AND INNOVATION FOUNDATION**

Richard Bennett

Information Technology and Innovation Foundation¹
1101 K St N.W.
Suite 610
Washington, DC 20005

November 2, 2010

¹ ITIF is a nonprofit, non-partisan public policy think tank committed to articulating and advancing a pro-productivity, pro-innovation and pro-technology public policy agenda internationally, in Washington and in the states. Through its research, policy proposals, and commentary, ITIF is working to advance and support public policies that boost innovation, e-transformation and productivity.

In Reply Comments filed in this proceeding, Skype Communications S. A. R. L. criticizes our claim in the Comment Phase to the effect that Skype video calling consumes a large amount of network bandwidth as “unfounded.”² They say: “Skype’s video-capable client operates in the same way, throttling down its rate of transmission based on available network resources, and consuming no more than 384 kbps — well within the speed of a basic DSL connection — for high-quality video. In fact, Skype will operate on bare minimum bandwidth, including video as low as 4 kbps, by, for example, prioritizing voice over video”³ This claim is inconsistent with Skype’s FAQ:⁴

The screenshot shows the top navigation bar of the Skype website with links for 'Buy Credit', 'Sign In', 'Features', 'Get Skype', 'Prices', 'Accessories', 'Business', and 'Support'. Below this is a 'Help' section with a search bar and a 'Search' button. The main content area is titled 'Technical issues & Using Skype — Skype for Windows beta' and features the article 'What do I need to make a group video call?' with a 'Print this article' link. The article text states that group video calling is available with Skype 5.0 for Windows and provides a list of requirements: Skype for Windows 5.0, a webcam, speakers and microphone, a broadband internet connection (2Mbps upload, 256Mbps download), a computer with a 2GHz processor and 512 MB RAM, and a DirectX 9.0c compatible video card. A 'Was this useful?' poll shows 'Yes' and 'No' buttons. A 'Related' sidebar on the right lists links for 'Step-by-step', 'Glossary', 'Search tips', 'Systems repr', 'Forums', 'Ways to Pay', 'View purchas', and 'Get more hel'.

² Skype Reply Comments at 12-13.

³ Skype Reply Comments at 13.

⁴ “Help for Skype: What do I need to make a group video call?,” *Skype*, n.d., <https://support.skype.com/faq/FA10613/What-do-I-need-to-make-a-group-video-call>. Retrieved November 2, 2010.

The Skype reply addresses the requirements of Skype's free person-to-person video calling product, but not those of its for-fee group video conferencing product. The video conferencing product produces multiple bi-directional video streams that require vastly more bandwidth than simple person-to-person video calling. According to Skype's web site, video conferencing users should have a minimum upload speed of 2 Mbps and a minimum download speed of 256 Mbps. Skype's download requirement as stated in their FAQ is most likely an error – there are very few broadband connections capable of 256 Mbps downloads outside the world of institutional Internet services, so they probably mean 6 Mbps – but its stated requirement on the upstream side is probably accurate. If so, it does exceed the upstream capacity of many DSL connections, and more importantly, it exceeds the capacity of every 3G wireless connection and that of most 4G wireless connections as well.

Skype fails to mention that its requirement for bandwidth is also dependent on the CPU capacity of end systems, as their application requires substantial compression and decompression. As CPU capacity in handheld devices is substantially less than in desktop computers – by a least a factor 10 – Skype's actual bandwidth consumption will be much higher on wireless networks than on wireline.

We don't file this reply to quibble. The regulations that the FCC contemplates for managed services and wireless networks not only must accommodate the needs of historical applications such as person-to-person video calling, they must also accommodate the needs of new and emerging applications such as high-quality group video conferencing. Many of the comments filed in these dockets have tended to over-emphasize historical applications to the detriment of new and emerging ones.

New and emerging applications also tend to utilize network resources in a different way than historical applications such as the World Wide Web. Web surfing is a "bursty" application in which brief periods of network activity are punctuated by long periods of inactivity. We download a web page, and then we read it. While we're reading, we're not

accessing the network. But applications such as Skype continually load the network with traffic for the duration of the conference, and thus place a high cumulative load on the network in addition to their high instantaneous load. The combination of high peak load and long duty cycles increases network cost and decreases the availability of shared capacity to others unless networks are actively managed in an application-aware fashion.

The historical model of Internet management that has prevailed since the conversion of the Internet from a research network dependent on the NSFNET network backbone to a self-supported commercial system has been appropriate to a particular mix of applications and only to that mix. The model of Internet management that will allow Skype's most advanced fee-based services to coexist harmoniously with such applications as streaming video is likely to be very different.

Internet applications change very quickly; so quickly in fact that policy professionals may be hard-pressed to stay abreast of the leading edge. Just last week, we learned that a single application – Netflix video streaming – consumes 20% of available network capacity in the United States during peak hours.⁵ As more Netflix users become comfortable with video streaming, more video content is available at higher resolution, and more people use Skype's advanced group conferencing application with its enormous appetite for bandwidth, it's not hard to project the requirement for more active management. These facts should be paramount as the Commission considers the role of managed services on the broadband networks of the near future, especially those based in wireless technology.

⁵ Farhad Manjoo, "Will Netflix destroy the Internet?," *Slate.com*, November 2, 2010, <http://www.slate.com/id/2273314/>. Some claim that no more than 340,000 users account for all this load.