

## Congestion control for users who don't have first-class internet access

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**ABSTRACT:** Standardized congestion control solutions to enable real-time applications and devices are needed for all users, but I'm particularly concerned that we develop workable solutions for users that don't have first-class internet access.

Good, reliable congestion control is probably the biggest obstacle to viable real-time communication on the web. Because there is no standard for congestion control, every device on the web is left to figure out how to deal with overloaded routers and links. Some do a reasonably good job given the limitations of the devices and networks their interoperating with, and others are wretched. From an application's perspective, since applications like real-time video calls are only as good as the least intelligent and least fair devices or networks they go through, real-time video calls made over the open web are very vulnerable to congestion problems.

I assert that the web is fundamentally broken for real-time communications. It's amazing it works as well as it does given the lack of guidance and support from standards organizations up to this point. Traditionally the solution has been to "throw bandwidth at the problem" which does not work well for many users, especially users in third world countries and other areas where more bandwidth is too expensive or simply not possible. So we must design viable, standardized congestion solutions for real-time communications.

What's more, these solutions should work well for all users, not just those with lots of bandwidth to spare, and for all devices that want to provide real-time communication services to users, not just those with millions of dollars to spend on research and carefully constructed intranets.

In particular, I would like solutions that address users who don't have first-class internet access. Less-than-first-class access may mean "last mile" links with slow speeds and low quality or poor wireless access quality as well as those with internet providers that are under-provisioned such that these users are frequently competing with other users either within the ISP's network or on the ISP's access links. Furthermore, many of these users may be operating on legacy equipment which won't be replaced until perhaps years after the new standard is written. So in addition to long term solutions, we need shorter term solutions that will work with systems in place today.

Part of Mozilla's mission is to help bring the web to all users and level the playing field so that all who want to participate can enjoy a similar, high (or at least reasonable) quality experience. I consider this work to be critical to leveling the playing field for real-time communication and making real-time communication truly viable and worthwhile for all users.