

As more and more critical applications, such as banking and finance, use the Internet as the information infrastructure, the Internet backbone is expected to be restored quickly in the case of network failures. The 50 millisecond restoration objective has been forced onto Internet backbones as the de facto restoration requirement although this objective was actually derived from the requirements of conventional telephone traffic. In today's Internet, the majority of the backbone bandwidth is consumed by P2P file transfer using TCP as the transport layer protocol.

Backbone operators have consistently reported that up to 80 % of the total traffic in their networks is P2P traffic. This percentage is expected to increase significantly in the near future because of subscriber adoption and increasing file sizes. Thus, the proper restoration objective for today's Internet backbone links should be based on the requirements of TCP-based P2P file transfer. In this study we consider the reaction of TCP to a failure in a continental-scale network. Our goal is to determine whether there are particular values for failure duration at which file transfer times increase markedly. Such values would indicate significant objectives for the restoration of Internet backbones. Our experimental results show that the 50 millisecond target is overly aggressive. Considering the current migration of client access from low-rate ADSL to high-rate ADSL2+ or VDSL2 and receive windows from 16 KB to 64KB or even larger we recommend 1 second as the restoration target for Internet backbone links.