

In this paper we argue that dimensioning for elastic traffic can be achieved in some network scenarios. The ``fun factor''  $\phi$  is introduced as a basic measure of perceived quality of service (QoS) for elastic traffic. As the impact of  $\phi$  on the perceived QoS is easy to see, target values for  $\phi$  for residential or business network access can be quantified. Several existing models for dimensioning data networks are compared, the M/G/r-PS model is generalized to arbitrary link rates and a rate convolution approach is presented which allows to dimension links when the distribution of bit rates available from the Internet is known. All approaches are compared using a consistent set of parameters derived from recent high-speed access measurement results, giving an indication of the general relation between the fun factor and the packet loss probability as a more classical QoS measure.

Index terms: Dimensioning; perceived QoS; Fun Factor; TCP; Elastic Traffic; Comparison; M/G/r-PS; Processor Sharing.

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