How can Long-Tail traffic be modelled?*

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Since, unlike traditional telephony traffic, packetised traffic exhibits self-similar or fractal characteristics, conventional traffic models do not apply to networks which carry long-tail traffic. Therefore, representing data on large scales by its mean is often useful in such cases as an average income or an average number of clients per day, but can be inappropriate like in the context of buffering or waiting queues (Wikipedia).

With the convergence of voice and data, the future multi-service network will be based on packetised traffic, and models which accurately reflect the nature of long-tail traffic will be required to develop, design and dimension future multi-service networks.(Wikipedia)

There is no unanimous pick about which of the competing models above is most appropriate, but the Poisson Pareto Burst Process (PPBP), is perhaps the most successful model to date. It is demonstrated to satisfy the basic requirements of a simple, but accurate, model of long-tail traffic.

Examples of other models that have been proposed for modelling long-tail traffic include:

Fractional ARIMA

Fractional Brownian Motion[1]

Iterated Chaotic Maps

Infinite Markov Modulated Processes

Markov Modulated Poisson Processes

Multi-fractal models

Matrix models

Wavelet Modelling

Exercise:

Why do you think we should bother ourselves with modelling long-tail traffic? Answer[2]

References:

Wikipedia. "Long-tail traffic", Wikimedia Foundation Inc, http://en.wikipedia.org/wiki/Long-tail_traffic, Last accessed 11 February 2006.

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[1]http://cnx.rice.edu/GroupWorkspaces/wg412/module.2006-02-15.8794597713/module_text/

[2]http://cnx.rice.edu/GroupWorkspaces/wg412/module.2006-02-15.3388397150/module_text/