Methods of Measuring of Loading and Indexes of Quality of Service

Olga Tkachenko, Yuriy Eremeev

Abstract - **Measuring of loading and indexes of quality of service can take place with a purpose: technical exploitation, prognostication of loading; study of streams of loading and quality, accumulation of statistical information. Measuring methods, measurings devices and measured indexes, get out depending on a purpose. The article is presented devoted the methods of measuring of loading and indexes of quality of service, their analysis and comparison.**

Keywords - **Measuring, loading, indexes of quality of service.**

To the system of measurings different requirements, which largely depend on the method of commutation which is used on a network, are produced on the whole. In addition, the system of measurings must allow to conduct control after such factors which in an aggregate can considerably increase loading to change character of his receipt and considerably to debase service.

It is necessary to underline that the only served loading is measured, for example, his intensity in. Intensity of entrance s and lost kh loadings can not be measured as there can not be the measured duration of neobslugovuvanogo call or volume of neperedanogo report. Therefore the values of s and kh are determined a calculation through in, if the measured indexes of quality of service, namely authenticity of timely delivery of reports of Q or size of losses [1].

For measuring of loading the continuous method of measuring and scanning method is mainly used. At the continuous method of measuring for the span of time from 0 to T of loading of N evened

$$H = \sum_{i=1}^{n} H_i .$$

If loading of N is got thus to divide into general time of measurings in hours, that to attribute to time unit, the sought after size will be intensity of loading of y_i:

$$y = \frac{H}{T} = \frac{\sum_{i=1}^{n} H_i}{\sum_{i=1}^{n} t_i} .$$

A scanning method consists in the count of number of the concerned devices in separate moments of time. It is known that the mean value of loading for period of measuring equals the middle number of the simultaneously concerned devices. In this case

$$H = \frac{1}{N} \sum_{i=1}^{n} k_i ,$$

where k – a number of the simultaneously concerned devices is at the i scanning; N – general number of scannings.

As after loading not conducted direct supervision, a scanning method is brought in by an error and it appears less exact as compared to a continuous method [2].

A middle error at determination of loading of N is determined after a formula Palm:

$$dH = H \sqrt{\frac{1}{n} \frac{1+e^{\alpha}}{1-e^{-\alpha}} (\alpha - 2)} ,$$

where n – number of employments;

α – relation of interval Δt between two moments of scanning (by scanning intervals) to mean time of employment Θ.

For determination of intensity of the served loading it is necessary to divide the got value of loading of N into a general time of measurings domain [3].

In networks with commutation of packages at measuring of different indexes of quality of service (numbers of reports, packages which expect service, to time of expectation of beginning of service and t. d.), as a rule, the methods of the direct counting out of number of reports are used. They are based on the reception of impulses for every event and accumulation of them in packages (for example, in meters) [4].

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Olga Tkachenko, Yuriy Eremeev - State University of Information and Communication Technologies, Solomenskaya Str., 7, Kyiv, 03110, UKRAINE, E-mail: okar@ukr.net