Recommendation T/CAC 2 (Stockholm 1989 (CAC))

INDICATORS FOR THE NETWORK PERFORMANCE ASPECTS OF THE QUALITY OF SERVICE OF INTERNATIONAL PACKET SWITCHED SERVICES

Recommendation proposed by the project team X.25

Text of the Recommendation adopted by the "Telecommunications" Commission:

"The European Conference of Posts and Telecommunications Administrations,

considering

— that users and suppliers of Telecommunications services are interested in the quality of service irrespective of how that service is provided,

— that Quality of Service (QOS) is a statement of the performance of all aspects of the service offered to the user, and that proposals for a general QOS framework are described in CEPT Recommendation T/SF 54 E and CCITT Recommendation G. 106,

— that Network Performance (NP) describes the externally perceived performance attributes of the network and is independent of terminal performance and user actions,

— that CCITT Recommendations X.134 through X.137 define the NP parameters for packet switched services,

— that no implementation of measurement methods and tools for these NP parameters is yet defined,

— that there is an urgent need for ready-to-implement methods and tools for evaluating the main aspects of the network performance part of the international packet switched service,

recommends

that the following set of performance indicators is used by CEPT Administrations in measuring, evaluating and communicating the network performance of the packet switched service."

1. INTRODUCTION

In order to evaluate the network performance it is necessary to have information on the most important elements of the general performance criteria: availability, dependability, accuracy and speed of service.

Indicators providing this information should, where possible, be derived from information sources, records and events available in most networks. Also the indicators should be easy to derive and, as far as possible, related to existing NP parameters.

2. INDICATORS

For each of the above performance criteria indicators are chosen which are representative of the service.

Availability	— Unsuccessful NC calls ratio (UNCR)
Dependability	— Mean time between NC disconnections (MTNC)
	— Mean time between Resets (MTRS)
Accuracy	— see *Note*
Speed of service	— Transmitted throughput (TTP)
	— Received throughput (RTP)
	— Round-trip delay (RTD)
	— Call set-up delay (CSD)

Note. No indicators are proposed for the accuracy aspect of service. Under normal conditions the accuracy performance of a PSPDN cannot be measured in a simple but representative manner.

3. RELATIONSHIP WITH CCITT NETWORK PERFORMANCE PARAMETERS

UNCR is related to the complement of the X.137 parameter Service availability.

MTRS is related to the inverse of the X.136 parameter Reset probability.

MTNC is related to the inverse of the X.136 parameter Premature disconnect probability.

TTP and RTP are related to the X.135 parameter Throughput capacity.

RTD is related to twice the X.135 parameter Data packet transfer delay.

CSD is related to the X.135 parameter Call set-up delay.

4. PRIORITIES

Of the above indicators UNCR, MTNC, TTP and RTP are considered to be essential for a first investigation of the performance of PSPDNS.

5. IMPLEMENTATION

A distinction is made between indicators which can be derived "internally", using, for example, existing billing or statistical tools, and indicators which have to be determined "externally" requiring dedicated test equipment and procedures.

The indicators derived internally are:
— Unsuccessful NC calls ratio (UNCR)
— Mean time between NC disconnections (MTNC)
— Mean time between resets (MTRS)

The indicators derived externally are:
— Transmitted throughput (TTP)
— Received throughput (RTP)
— Round-trip delay (RTD)
— Call set-up delay (CSD)

Definitions, requirements, procedures and processing for each of the internally derived indicators are described in Recommendation T/CAC 3 E. The externally derived indicators are similarly described in Recommendation T/CAC 4 E.