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**SERIES X: DATA NETWORKS AND OPEN SYSTEM
COMMUNICATION**

Public data networks – Network aspects

**Accuracy and dependability performance values
for public data networks when providing
international packet-switched services**

ITU-T Recommendation X.136

(Previously CCITT Recommendation)

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ITU-T RECOMMENDATION X.136

ACCURACY AND DEPENDABILITY PERFORMANCE VALUES FOR PUBLIC DATA NETWORKS WHEN PROVIDING INTERNATIONAL PACKET-SWITCHED SERVICES

Summary

This Recommendation provides accuracy and dependability parameters and associates worst-case objectives within the X.130-Series Recommendations on PSPDN performance.

Source

ITU-T Recommendation X.136 was revised by ITU-T Study Group 7 (1997-2000) and was approved under the WTSC Resolution No. 1 procedure on the 9th of August 1997.

FOREWORD

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The World Telecommunication Standardization Conference (WTSC), which meets every four years, establishes the topics for study by the ITU-T Study Groups which, in their turn, produce Recommendations on these topics.

The approval of Recommendations by the Members of the ITU-T is covered by the procedure laid down in WTSC Resolution No. 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation X.136

ACCURACY AND DEPENDABILITY PERFORMANCE VALUES FOR PUBLIC DATA NETWORKS WHEN PROVIDING INTERNATIONAL PACKET-SWITCHED SERVICES

(revised in 1997)

1 Introduction and scope

1.1 This Recommendation is the third in a series of four Recommendations (X.134 to X.137) that define performance parameters and values for international packet-switched data communication services. Figure 1 illustrates the scope of these four Recommendations and the relationships among them.

1.2 Recommendation X.134 divides a virtual connection into basic sections whose boundaries are associated with X.25 and X.75 interfaces; defines particular collections of basic sections, called virtual connection portions, for which performance values will be specified; and defines a set of packet-layer reference events (PEs) which provide a basis for performance parameter definition. The basic sections consist of network sections and circuit sections. They are delimited, in each case, by physical Data Terminal Equipment (DTE) or Data Switching Equipment (DSE) interfaces. Virtual connection portions are identified either as national portions or international portions. Each PE is defined to occur when a packet, crossing a section boundary, changes the state of the packet-layer interface.

1.3 For comparability and completeness, packet-switched network performance is considered in the context of the 3×3 performance matrix defined in Recommendation X.140. Three protocol-independent data communication functions are identified in the matrix: access, user information transfer, and disengagement. These general functions correspond to call set-up, data (and interrupt), transfer, and call clearing in packet-switched virtual call services conforming to the Recommendations X.25 and X.75. Each function is considered with respect to three general performance concerns (or "performance criteria"): speed, accuracy, and dependability. These express, respectively, the delay or rate, degree of correctness, and degree of certainty with which the function is performed.

1.4 Recommendation X.135 defines protocol-specific speed of service parameters and values associated with each of the three data communication functions. This Recommendation defines protocol-specific accuracy and dependability parameters and values associated with each function. The Recommendation X.135 parameters and this Recommendation parameters are called "primary parameters" to emphasize their direct derivation from packet-layer reference events.

1.5 An associated two-state model provides a basis for describing overall service availability. A specified availability function compares the values for a subset of the primary parameters with corresponding outage thresholds to classify the service as "available" (no service outage) or "unavailable" (service outage) during scheduled service time. Recommendation X.137 specifies the availability function and defines the availability parameters and values that characterize the resulting binary random process.

1.6 Eight accuracy and dependability parameters are defined in this Recommendation: two access parameters (call set-up error probability and call set-up failure probability), five user information transfer parameters (residual error ratio, reset stimulus probability, reset probability, premature disconnect stimulus probability, and premature disconnect probability), and one disengagement parameter (call clear failure probability). Each parameter can be applied to any basic section or portion of a virtual connection. This generally makes the parameters useful in performance allocation and concatenation.

1.7 This Recommendation specifies accuracy and dependability values for national and international portions of two types (see Table 1). Performance values for data terminal equipment are not specified, but the parameters defined in this Recommendation may be employed in such specification to assist users in establishing quantitative relationships between network performance and quality of service (see Recommendation X.140).

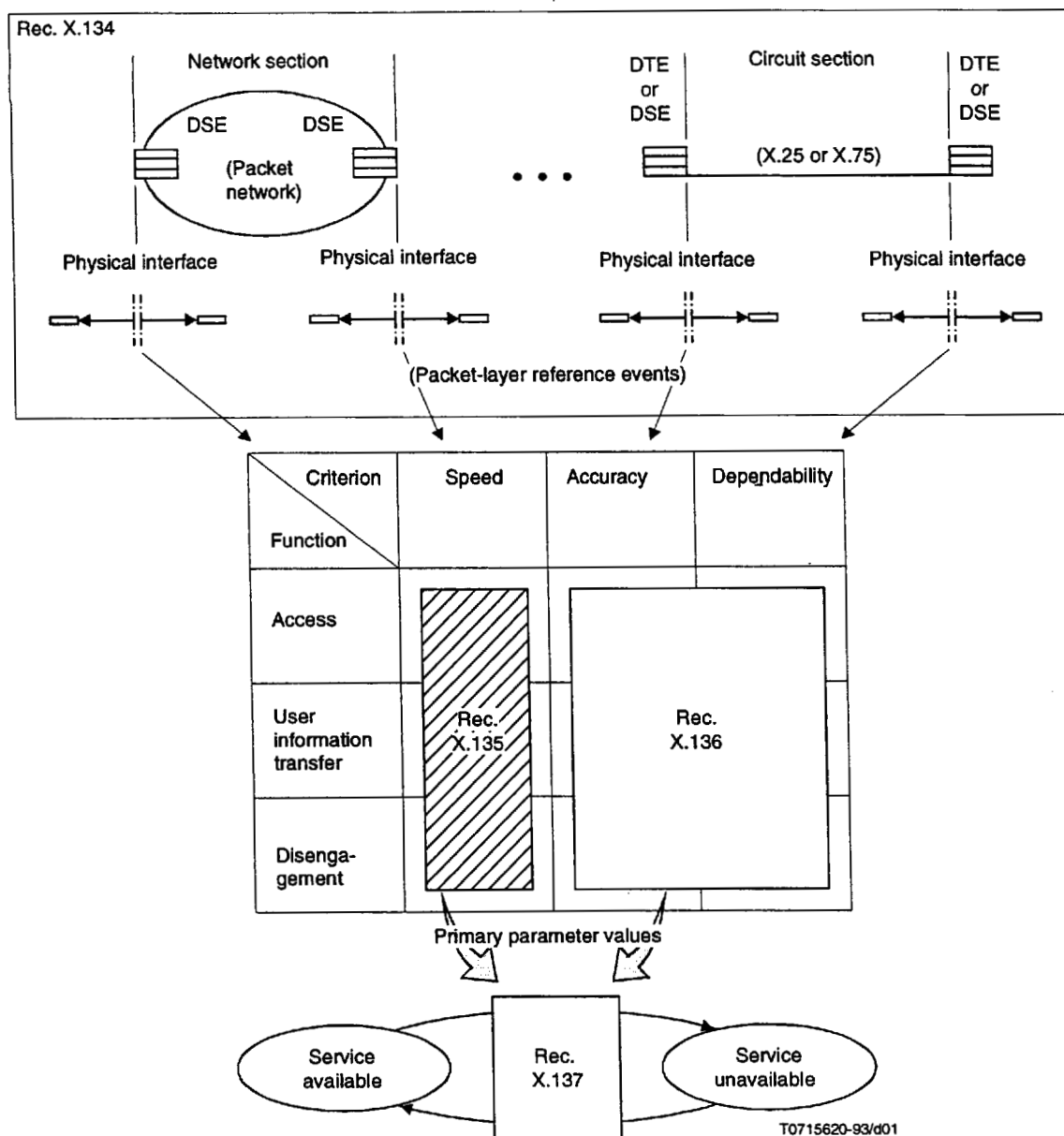


Figure 1/X.136 – Packet-switched service performance description framework

Table 1/X.136 – Virtual connection portion types for which performance values are specified^{a)}

Portion type	Typical characteristics
National A	Terrestrial connection via an access network section.
National B	Connection via an access network section with one satellite circuit; or via an access network section and one or more transit network sections.
International A	Connection via a direct terrestrial internetwork section.
International B	Connection via two satellite circuits and one transit network section; or via one satellite circuit and two or more transit network sections.
a) The values specified for type B portions also apply to virtual connection portions not explicitly identified as type A or type B.	