



INTERNATIONAL TELECOMMUNICATION UNION

**ITU-T**

TELECOMMUNICATION  
STANDARDIZATION SECTOR  
OF ITU

**X.144**

**Amendment 1**  
(02/2003)

SERIES X: DATA NETWORKS AND OPEN SYSTEM  
COMMUNICATIONS

Public data networks – Network aspects

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User information transfer performance parameters  
for data networks providing international frame relay  
PVC service

**Amendment 1**

ITU-T Recommendation X.144 (2000) – Amendment 1

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# **ITU-T Recommendation X.144**

## **User information transfer performance parameters for data networks providing international frame relay PVC service**

### **Amendment 1**

#### **Summary**

This amendment provides provisional values for the Availability Threshold Criteria as defined in Table 1/X.144.

#### **Source**

Amendment 1 to ITU-T Recommendation X.144 (2000) was prepared by ITU-T Study Group 17 (2001-2004) and approved under the WTSA Resolution 1 procedure on 13 February 2003.

## FOREWORD

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# ITU-T Recommendation X.144

## User information transfer performance parameters for data networks providing international frame relay PVC service

### Amendment 1

#### 1) Introduction

This amendment provides provisional values for the Availability Threshold Criteria as defined in Table 1/X.144.

#### 2) Amendments

Replace existing clause 6.1 and Table 1/X.144 with the following text:

##### 6.1 PVC availability function

Four performance parameters, defined in clause 5, are used in computing the PVC availability:

- user information frame loss ratio (for offered traffic conforming with the CIR);
- user information frame loss ratio (for offered traffic conforming with EIR);
- residual frame error ratio; and
- extra frame rate.

These parameters are called the availability decision parameters. Each decision parameter is associated with an outage threshold. These decision parameters and provisional values for their outage thresholds are listed in Table 1.

For PVCs that implement the STATUS messaging procedures defined in ITU-T Rec. X.36, ITU-T Rec. X.76, or Annex A/Q.933, and utilize bidirectional procedures only on the network-to-network interfaces (NNIs), transmission of specific pairs of STATUS message indications shall also serve as availability criteria. For a set of connection sections bounded by boundaries  $B_i$  and  $B_j$ , the section under test, the transmission of an inactive indication exiting the section under test shall serve as a transition from the available state to the unavailable state. Re-entry to the available state shall be accomplished by the transmission of an active indication exiting the section under test. Periods of scheduled PVC unavailability are excluded (see 6.2.1 below).

Performance is considered independently with respect to each availability decision parameter. If the value of the parameter is equal to or better than the defined outage threshold, performance relative to that parameter is defined to be acceptable. If the value of the parameter is worse than the threshold, performance relative to that parameter is defined to be unacceptable.

A set of connection sections bounded by boundaries  $B_i$  and  $B_j$  is defined to be *available* (or to be in the available state) if the performance is acceptable relative to all decision parameters and transition criteria.

A set of connection sections bounded by boundaries  $B_i$  and  $B_j$  is defined to be *unavailable* (or to be in the unavailable state) if the performance of one or more of the four decision criteria is unacceptable, or if a transition to the unavailable state has occurred via the transmission of an inactive indication in a STATUS message exiting the sections bounded by  $B_i$  and  $B_j$ .

The intervals during which a connection section or concatenated set of connection sections is unavailable are identified by superimposing the unacceptable performance periods for all decision parameters as illustrated in Figure 7.

In order to exclude transient impairments from being considered as periods of unavailability, a single test of the availability state must be 5 minutes or longer. In order to reduce the probability of state transitions during a test of the current availability state, each test should be less than 20 minutes.

**Table 1/X.144 – Outage criteria for the availability decision parameters**

| Availability decision parameters   | Criteria<br>(Note 3)              |
|--|-----------------------------------|
| FLR <sub>c</sub> (Note 1) – User information frame loss ratio for a population of frames with DE = 0 when all DE = 0 frames conform with the CIR   | FLR <sub>c</sub> > C <sub>1</sub> |
| FLR <sub>e</sub> (Note 2) – User information frame loss ratio for a population of frames input with DE = 1 when all input DE = 1 frames conform with the EIR and all DE = 0 frames conform with the CIR  | FLR <sub>e</sub> > C <sub>2</sub> |
| RFER – Residual frame Error Ratio  | RFER > C <sub>3</sub>             |
| EFR – Extra frame Rate   | EFR > C <sub>4</sub>              |
| <p>NOTE 1 – Applicable as an availability decision parameter only when CIR &gt; 0. If high FLR is observed, the offered DE = 0 traffic should be reduced to CIR before judging the availability state.</p> <p>NOTE 2 – Applicable as an availability decision parameter only when CIR = 0 and there are no DE = 0 frames. If high FLR is observed, the offered DE = 1 traffic should be reduced to EIR before judging the availability state.</p> <p>NOTE 3 – The following threshold criteria values are specified: C<sub>1</sub> = 10%, C<sub>2</sub> = 25%, C<sub>3</sub> = 1%, C<sub>4</sub> = 1/300. All values are provisional and they need not be met by networks until they are revised (up or down) based on real operational experience.</p> <p>NOTE 4 – The connection section (or set of sections) may also be considered unavailable if the underlying physical layer at either section boundary is unavailable (no signal, alarm condition, etc.) due to causes within the connection section(s).</p> |                                   |



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