

Minimal quality indicators of non-vocal electronic communications services

A. Non-vocal ISDN services

Definitions:

- ISDN (Integrated Services Digital Network) is an international communications standard that allows the transmission of voice, images and data through digital telephone lines.
- ISDN Broadband is an ISDN version that allows a larger data transfer, at a higher speed (essential for larger data transmissions, such as video transmissions during video conferences). Requires optic cables.
- ISDN Basic Rate allows the transfer of 144 Kbps divided over three different channels, in order to allow the simultaneous transfer of different types of data. Language and data are split over 2x64 Kbps channels (B channels) and one 1x16 Kbps channel (D channel) used for control and signaling.

1. With reference to all support services

1.1. Reported complaints over ISDN, per year

Definition:

A valid complaint report is a report regarding service interruption or impair, affecting one or more ISDN channels. This report shall refer to the network, shall be forwarded by the user and shall include request for repairs. Damages of any equipment that belong to the user's side of the network are excluded.

REPORTS ON MALFUNCTION AND IMPAIRED SERVICE	NON-AVAILABILITY PERIODS	
	Beginning	End
1. <i>Confirmed</i> reports on malfunction		
Malfunctions previously ascertained by the operator		When the service is again at user's disposal (on the first attempt of that kind)
If a user reports a malfunction confirmed through tests and investigations conducted by the provider, it must be considered as a valid malfunction, and the service provider must accept that the malfunction appeared at the moment specified by the report.	According to user's statement	
Malfunctions remedied when found		

Malfunctions caused by deliberate service interruptions exceeding the period announced by the operator	The moment declared by the operator as the end of the deliberate interruption	
Malfunctions caused by service interruptions without the user being previously informed	The moment the operator announced as beginning of the deliberate interruption (if the beginning time of the interruption is not known by the complaints registration office, the moment declared by the user shall be considered valid)	The moment the operator declared as end of the deliberate interruption (if the deadline of the deliberate interruption is not yet known at the complaints registration office, the moment when the service is again available to the user, or the first attempt of that kind, shall be considered valid)
<i>2. Unconfirmed fault reports</i>		
Problems caused by user's equipment or by errors committed by the user	Are not taken into consideration	
<i>3. The measure of malfunctions</i>		
The measure represents the number of valid malfunctions reported by the user or by its representative.	The statistics must present the average value of the reports regarding the yearly malfunctions per ISDN access. They are conducted once a year.	It is up to the individual service provider whether he provides supplementary equipment, in order to make this value of common understanding.
<i>4. Malfunctions measurement</i>		

<p>The number of malfunctions must rely on the valid users' reports. A report that refers to more than one access line connecting the users and the local central must be analyzed once for every access line.</p>	<p>The indicator "Reported malfunctions per ISDN access over one year" is being measured by reporting the valid damages complaints registered over one year to the medium number of access lines to ISDN that belong to the network analyzed over the same year.</p>	<p><u>The value of the indicator:</u></p> <p>Not more than 0.20 malfunctions per ISDN access over one year.</p>
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1.2. The performance of the Severely Errored Seconds

Definition:

A Severely Errored Second (SES) represents an interval of a second that has a bit error (BER) $> 1 \times 10^{-3}$ for a period of consecutive ten seconds (as defined by the Recommendation G.821 of ITU-T).

These ten seconds are considered to be unavailable time. A new period of time begins either with the first second of a ten consecutive seconds period with $BER < 1 \times 10^{-3}$, or with the detecting of Loss of Signal (LOS) or Alarm Indication Signal (AIS).

When $BER = 1 \times 10^{-3}$, there is incertitude during one second.

A Severely Errored Second (SES) is the one-second period that includes at least 0,1% of bits errored.

The measure of Severely Errored Seconds		
<p>The measure of Severely Errored Seconds (SES) must express the percentage of seconds that have a substantial error.</p>	<p>The statistics must be presented as percentage of SES for a representative number of ISDN 64 Kbps connections.</p>	<p><u>Indicators value:</u></p> <p>Not more than 1%.</p>

2. For the support services that refer to commuted circuits

2.1. Rate of failed calls

Definitions:

The rate of failed calls represents the percentage ratio between the number of failed calls and the total calls within a specified period of time.

A failed call is a tried call addressing a valid identification number properly dialed for which the signaling system of the called user does not receive the message "ALERT" or "CONNECT", nor any other indication of "busy user" nor other distance rejection indication with the value of the location corresponding to the public/private network serving the distance user, in less than 30 seconds

after the moment when the message "INITIAL ADDRESS MESSAGE" or the messages "SUBSEQUENT ADDRESS MESSAGE" are received by the network.

Measure and measurement	
A 30 seconds break was established in order to allow a "no user responding" when the distance terminator is closed. The call ended with "no user responding" within a 30 seconds interval shall be considered as a call made.	<p><u>The value of the indicators:</u></p> <p>Maximum 2%.</p>

2.2. The time required for establishing contact

Definitions:

The time required for establishing contact is the period that starts when the message "INITIAL ADDRESS MESSAGE" or "SUBSEQUENT ADDRESS MESSAGE", required for circuit selection, is received by the network and ends with the moment when a message "ALERT" or "CONNECT", or an indication "busy user", or any rejection indications having the value of the location corresponding to the public/private network that serves the distant user, is received by the signaling system of the caller.

Measure and measurement:	
This call set-up time will require a time for processing up to the most distanced terminal.	<p><u>The value of the indicator:</u></p> <p>Maximum 5 seconds.</p>

3. For support services that are present in a circuit mode

This category must correspond to the quality requirements applied for leased lines.

4. For all package support services

4.1. Connection efficiency

Definition:

The efficiency of a virtual connection is defined as a percentage of the number of data bits belonging to the user that are successfully one way transferred from one end to another, per time unit, according to the category of virtual connection considered.

Observations:	
Throughput: The Throughput is the unit of measurement for the quantity of information that can be transmitted through a certain communication	<p><u>The value of the indicator:</u></p> <p>At least 95%.</p>

channel, within a given time. For numeric transmissions, this unit is generally given in bits per second.

4.2. Local loop delay

Definition:

The local loop delay for a data connection is defined as the time interval since the first bit of the package reaches the access line of the transmitting unity, until the last bit of the same package is received.

Measure and measurement:	
It is recommended that measurements be conducted so that they precisely reflect the traffic variations corresponding to the hours of one day, the days of one week and the months of one year.	<u>The value of the indicator:</u> Maximum 150 milliseconds (Recommendation G 114 of ITU-T)

5. For the package switched commutation services

Regarding the techniques on connection, the temporarily established connections means, used for data transmission, consume certain resources regardless of the transfer of this information through the established connection.

Package switched commutation networks make a more efficient use of the capacity of transmission.

Package switched commutation has the following characteristics:

- the band length is divided among many users;
- the data can be simultaneously transmitted towards more receivers;
- allows communication between terminals having different transfer rates or different interfaces;
- the global accessibility of X.25 data networks; it is an ideal solution for long distance communications or for communications through poor quality transmission links.

The band length admitted through these networks ranks between 64 Kbps and 2 Mbps.