



ATIS-1000620.a.2014(R2019)

**Multi-Rate Circuit-Mode Bearer Service for ISDN –
Addendum to the Circuit-Mode Bearer Service Category
Description**

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American National Standard for Telecommunications

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Description**

Alliance for Telecommunications Industry Solutions

Approved June 2014

American National Standards Institute, Inc.

Abstract

This document is a supplement to ATIS-1000620 and revises the standard to add the category of multi-rate circuit-mode bearer services.

Foreword

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Suggestions for improvement of this document are welcome. They should be sent to the Alliance for Telecommunications Industry Solutions, PTSC, 1200 G Street NW, Suite 500, Washington, DC 20005.

At the time of consensus on this document, PTSC, which was responsible for its development, had the following leadership:

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ATIS Standard on –

Multi-Rate Circuit-Mode Bearer Service for ISDN – Addendum to the Circuit-Mode Bearer Service Category Description

1 Introduction

This supplement to *American National Standard for Telecommunications - Integrated Services Digital Network (ISDN)- Circuit-Mode bearer service category description*, ATIS-1000620, revises the standard to add the category for the multi-rate circuit-mode bearer service. The following changes are made to ATIS-1000620:

1.1 Replace 1.1 – "Scope", first paragraph, as follows:

This standard explains the ISDN Circuit-Mode bearer services from a user's perspective. The scope of this standard is limited to on-demand Circuit-Mode services for 64 kbit/s and n times 64 kbit/s for n from 2 up to 24.

1.2 Add the following reference to clause 2, "Normative references":

ITU-T Recommendation I.140, *Attribute Technique for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN*

1.3 Add the following definitions to clause 3. "Definitions":

3.12 8kHz Integrity: (see ITU-T Recommendation 1.140, annex A.) This value applies when:

- a) At each user-network interface, intervals of 125 μ sec are implicitly or explicitly demarcated, and
- b) All bits submitted within a single demarcated 125 μ sec interval are delivered within a corresponding single demarcated 125 μ sec interval.

NOTE – For purposes of demarcating 125 μ sec intervals for 8-kHz integrity, the intervals shall be demarcated by the layer 1 frame structure. That is:

- for the basic-rate interface at the S and T reference point (see ATIS-0600605), each layer 1 frame constitutes two whole 125 μ sec intervals;
- -for the basic-rate interface at the U reference point (see ATIS-0600601), each layer 1 frame constitutes twelve whole 125 μ sec intervals;
- -for the primary-rate interface (see ATIS-0600408), each layer 1 frame constitutes one whole 125 μ sec interval.

(This note is not in ITU-T Recommendation 1.140).

3.13 Time slot sequence Integrity: (see ITU-T Recommendation 1.140, annex A.) This value applies when:

- a) At each user-network interface, time slots are implicitly or explicitly demarcated for each access channel of an aggregate of access channels; and
- b) The information parts delivered from the time slots at the receiving end are in the same order as submitted at the transmitting end.

NOTE- Preserving the order of the bits within an individual time slot from the transmitting to the receiving end is not part of this definition.

3.14 unrestricted digital Information: (see ITU-T Recommendation 1.140, annex A.) Transfer of information sequence of bits at its specified rate without alteration. This implies:

- -bit sequence independence;
- -digit sequence integrity;
- bit integrity.

3.15 contiguous time-slot assignment: The time slots used for the call are adjacent.

3.16 noncontiguous time-slot assignment: The time slots used for the call are not necessarily adjacent.

1.4 Add the following list item to clause 4, "General description":

h) Circuit-Mode, multi-rate.

1.5 Add the following paragraph to 5.1, "Provision and withdrawal":

For the multi-rate bearer-service category, the service provider may support contiguous time-slot assignment or noncontiguous time slot assignment on the access interface. The set of information transfer rates supported by the service provider is a service-provider option.

Table 1, Subscription options is attended as follows:

Table 1 - Subscription Options

Subscription option	Value
ISDN numbers	list of one or more numbers
Maximum number of information channels available to an ISDN number or group of ISDN numbers on the interface	m , where m is not greater than the number of information channels on the interface
Maximum number of total calls present to and from an ISDN number or group of ISDN numbers on the interface	n , where n is not greater than the number of information channels on the interface
Calling party number required in call setup requests	yes or no
Assignment of time slots (see note 2)	contiguous, noncontiguous
<p>NOTES</p> <p>1 In the case of one ISDN number the option given above for the number of total calls can only exceed the number of information channels in association with a Supplementary Service (e.g., Call Waiting). As a network provider option, separate values may be specified for incoming and for outgoing calls for either or both of the limits.</p> <p>2 This subscription option only applies to the primary-rate interface for the multi-rate bearer-service category.</p>	

1.6 Add the following text as 5.3.4, "Failure situation during call":

5.3.4 Failure situation during Call

If the network or the user cannot continue to support the information transfer rate requested at call setup, then the entity that detects the failure shall initiate call termination procedures with an appropriate indication of the cause of failure.

Add the following items to clause 7, "Interworking requirements":

- g) Between the ISDN and a non-ISDN network offering the multi-rate bearer service;
- h) Between the multi-rate bearer service and the 384 kbit/s, 1472 kbit/s and 1536 kbit/s circuit- mode digital bearer services.

1.7 Add the following text as 4.8, "multi-rate circuit -mode 9earer service category" :

4.8 Multi-rate circuit-mode bearer service category

The multi-rate circuit-mode bearer service category allows users to request from the ISDN on a demand basis the establishment and release of circuit-mode connections supporting unrestricted information transfer rates at integer multiples of 64 kbit/s from 128 kbit/s up to and including 1536 kbit/s for the primary-rate ISDN interface and 128 kbit/s for the basic-rate ISON interface.

This bearer service category supports rates of 128,192,...,1536 kbit/s corresponding to $n \times 64$ kbit/s where $n = 2,3,...,24$ using multiple B-channels lor the primary-rate interface . For the basic-rate interface, this bearer-service category supports 128 kbit/s using two B-channels.

This bearer service category allows unrestricted transfer of $n \times 64$ kbit/s user information (where $n = 2-24$ for primary rate and $n = 2$ for basic rate) without alterations at the S, Tor U reference point. It is the user's responsibility to provide for compatibility between the user equipment at each S, Tor U reference point. The network transports the user data using 8-kHz integrity with time-slot sequence integrity. This

bearer service category also preserves the order of the bits within an individual time slot from the transmitting to the receiving end.

This bearer service category is applicable to the primary-rate ISDN interface and basic-rate ISDN interface and is suitable for various applications. Examples of applications include:

- a) Business video conferencing based on the use of video codec operating at multiples of 64-kbit/s rate as specified, for example, in ITU-T Recommendation H.261;
- b) Interconnection of Local Area Networks (LANs);
- c) Interconnection of mainframes;
- d) Desktop video conferencing and imaging;
- e) Private network backup for disaster recovery.

This bearer service category is transferred over multiple time slots; signalling is provided in the D-channel of the same interface structure for the basic-rate or primary-rate interface or in the D-channel of another interface in the case of the primary-rate interface.

NOTE – Providing signaling on the same primary-rate interface limits the maximum transfer rate to 1472 kbit/s (23 x 64 kbit/s); otherwise, it can reach 1536 kbit/s (24 x 64 kbit/s)

This Circuit-Mode bearer service category allows: two users (e.g., workstations, multiplexers, host computers, PBXs) in a point-to-point configuration to communicate via the ISDN using $n \times 64$ kbit/s digital signals (where $n = 2 - 24$ for primary-rate interface and $n = 2$ for basic-rate interface) in both directions continuously and simultaneously for the duration of the call.

The time-slot assignment has a local meaning only. In particular, the contiguous assignment of time slots at one interface does not mean that the time slots shall be assigned contiguously within the network and at the terminating interface. The time slots selected shall belong to a single interface and shall not span several interfaces.

The information-transfer attributes and their values for this bearer service category are as follows:

- a) *Information transfer mode*: Circuit
- b) *Information transfer rate*: Multi-Rate (128, 192, ..., 1536 kbit/s).
- c) *Information transfer capability*: Unrestricted digital information
- d) *Structure*: 8 kHz Integrity with Time slot sequence integrity
- e) *Establishment of communication*: Demand
- f) *Communication configuration*: Point-to-point.
- g) *Symmetry*: Bidirectional symmetric.

1.8 Add the following item to annex A, "Differences between this standard and ITU-T Recommendation I.231":

14. Clause 4.0 item (h) , and subclause 4.8: ITU-T Recommendation I.231 does not identify a category for multi-rate circuit mode.