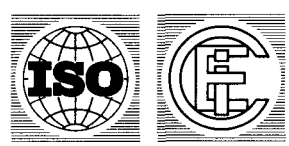
INTERNATIONAL STANDARD

ISO/IEC 4335

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Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — Elements of procedures

Technologies de l'information — Télécommunications et échanges d'information entre systèmes — Procédures de commande de liaison de données à haut niveau (HDLC) — Eléments de procédures



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 4335 was prepared by Joint Technical Committee ISO/IEC JTC1, *Information technology*.

This fourth edition cancels and replaces the third edition (ISO 4335 : 1987), which has been technically revised.

Annexes A, B and C of this International Standard are for information only.

Introduction

General

High-level data link control (HDLC) procedures are designed to permit synchronous or start/stop, code-transparent data transmission. This International Standard describes the HDLC elements of procedures. Further studies are in progress to identify and define additional elements of procedures which may be included at a later date.

In HDLC procedures, the normal cycle of the code-transparent data communication between two data stations consists of the transfer of frames containing information from the data source to the data sink acknowledged by a frame in the opposite direction. Until the data station comprising the data source receives an acknowledgement, it holds the original information in memory in case the need should arise for retransmissions.

Data sequence integrity between the data source and the data sink is effected by means of a numbering scheme, which is cyclic within a modulus specified in this International Standard and measured in terms of frames. An independent numbering scheme is used for each data source/data sink combination on the data link.

The acknowledgement function is accomplished by the data sink informing the data source of the next expected sequence number. This can be done in a separate frame, not containing information, or within the control field of a frame containing information.

HDLC procedures are applicable to unbalanced data links and to balanced data links.

Unbalanced data links

An unbalanced data link involves two or more participating data stations. For control purposes, one data station on the data link assumes responsibility for the organization of data flow and for unrecoverable data link level error conditions. The data station assuming these responsibilities is known as the primary station, and the frames it transmits are referred to as command frames. The other data stations on the data link are known as the secondary stations, and the frames they transmit are referred to as response frames.

For the transfer of data between the primary station and the secondary stations, two cases of data link control are considered (see figures 1 and 2). In the first case, the data station comprising the data source performs a primary station data link control function and controls the data station comprising the data sink that is associated with a secondary station data link control function, by select-type commands.

In the second case, the data station comprising the data sink performs a primary station data link control function and controls the data station comprising the data source that is associated with a secondary station data link control function, by poll-type commands.

The information flows from the data source to the data sink, and the acknowledgements are always transmitted in the opposite direction.

These two cases of control may be combined so that the data link becomes capable of two-way alternate communication, or two-way simultaneous communication.

Balanced data links

A balanced data link involves only two participating data stations. For control purposes, each data station assumes responsibility for the organization of its data flow and for unrecoverable data link level error conditions associated with the transmissions that it originates. Each data station is known as a combined station and is capable of transmitting and receiving both command and response frames.

For the transfer of data between combined stations, the data link control functions illustrated in figure 3 are utilized. The data source in each combined station controls the data sink in the other combined station by the use of select-type commands. The information flows from the data source to the data sink, and the acknowledgements are always transmitted in the opposite direction. The poll-type commands may be used by each combined station to solicit acknowledgements and status responses from the other combined station.

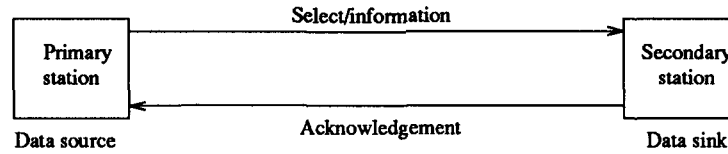


Figure 1 — Unbalanced data link configuration (case 1)

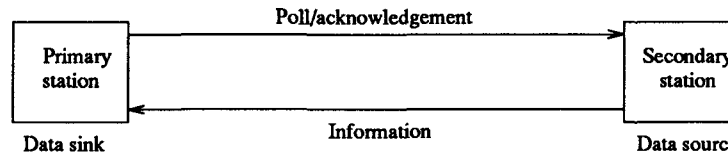


Figure 2 — Unbalanced data link configuration (case 2)

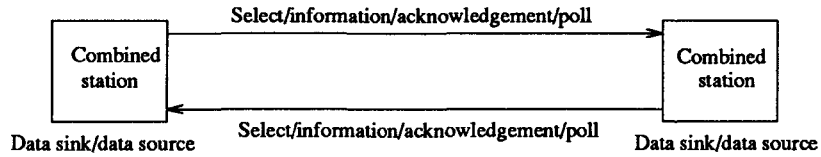


Figure 3 — Balanced data link configuration

Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — Elements of procedures

1 Scope

This International Standard specifies elements of data link control procedures for synchronous or start/stop, code-transparent data transmission using the HDLC frame structure specified in ISO 3309 and independent frame numbering in both directions.

These HDLC elements of procedures are defined specifically in terms of the actions that occur on receipt of commands at a secondary station or a combined station.

This International Standard is intended to cover a wide range of applications; for example one-way, two-way alternate or two-way simultaneous data communication between data stations which are usually buffered, including operations on different types of data circuits; for example multipoint/point-to-point, duplex/half-duplex, switched/non-switched, synchronous/start-stop, etc.

The defined HDLC elements of procedures are to be considered as a common basis for establishing different types of control procedures. This International Standard does not define any single system and should not be regarded as a specification for a data communication system. Not all of the commands or responses are required for a particular system implementation.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 2382-9 : 1984, *Information technology - Vocabulary - Part 9 : Data communication.*

ISO/IEC 3309 : 1991, *Information technology - Telecommunications and information exchange between systems - High-level data link control (HDLC) procedures - Frame structure.*

3 Definitions

For the purposes of this International Standard, the following definitions apply (see also ISO/IEC 2382-9).

3.1 abort : A function invoked by a sending primary, secondary or combined station causing the recipient to discard (and ignore) all bit sequences transmitted by the sender since the preceding flag sequence.

3.2 accept : The condition assumed by a data station (primary, secondary or combined station) upon accepting a correctly received frame for processing.

3.3 address field (A) : The sequence of eight (or any multiple of eight, if extended) bits immediately following the opening flag sequence of a frame identifying the secondary/combined station sending (or designated to receive) the frame.

3.4 address field extension : Enlarging the address field to include more addressing information.