TECHNICAL REPORT

ISO/IEC TR 11802-2

Sixth edition
2005-11-01

Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Technical reports and guidelines —

Part 2: Standard Group MAC Addresses

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseaux locaux et métropolitains — Rapports techniques et lignes directrices

Partie 2: Adresses MAC de groupe normalisé

Reference number
ISO/IEC TR 11802-2:2005(E)

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

— type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;

— type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;

— type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard ("state of the art", for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

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ISO/IEC TR 11802-2, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems.*

This sixth edition cancels and replaces the fifth edition (ISO/IEC TR 11802-2:2002), which has been technically revised.

ISO/IEC TR 11802 consists of the following parts, under the general title *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Technical reports and guidelines*:

— *Part 1: The structure and coding of Logical Link Control addresses in Local Area Networks [Technical Report]*

— *Part 2: Standard Group MAC Addresses [Technical Report]*

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Introduction

The standards for LANs generally comprise the physical layer, the medium access control (MAC) sublayer, and the logical link control (LLC) sublayer. In OSI terminology, the MAC and LLC sublayers are considered to be sublayers of the OSI Data Link layer. Both the MAC and LLC sublayers contain fields for addressing.

A Universally Administered Address Block has been allocated for the assignment of Group MAC Addresses for use in International Standards. This Technical Report contains a description of the MAC addressing conventions and a reference to the url that contains the criteria, which will be used when considering a request for an assignment, and a record of assignments. This website is managed by the august IEEE-SA Registration authority.

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Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Technical reports and guidelines —

Part 2:
Standard Group MAC Addresses

1 Scope

This Technical Report provides:

— A description of the Binary and Hexadecimal Representation of ISO/IEC 8802 LAN MAC addresses.

— A description of the sub-division of the Universally Administered Standard Group MAC Address Block into: ISO/IEC 10038 MAC Bridge Filtered MAC Group Addresses and Standard MAC Group Addresses.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 8802-5, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 5:Token ring access method and physical layer specifications*

ISO/IEC 9542, *Information processing systems — Telecommunications and information exchange between systems — End system to Intermediate system routeing exchange protocol for use in conjunction with the Protocol for providing the connectionless-mode network service (ISO/IEC 8473)*

ISO/IEC 15802-3, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Common specifications — Part 3: Media access control (MAC) bridges*

ISO/IEC 10039, *Information technology — Open systems interconnection — Local area networks — Medium Access Control (MAC) service definition*

3 Abbreviations

The following abbreviations are used in this Technical Report

MAC Medium Access Control

LAN Local Area Network

LLC Logical Link Control

ANSI American National Standards Institute

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IEEE Institute of Electrical and Electronic Engineers

4 Binary and Hexadecimal Representation of LAN MAC Addresses

The Hexadecimal (in hexadecimal) Representation of LAN MAC addresses has been defined in ISO/IEC 15802-1 and is used throughout this Technical Report.

Figure 1 illustrates an example of a 48-bit LAN MAC address in both Binary and Hexadecimal Representations.

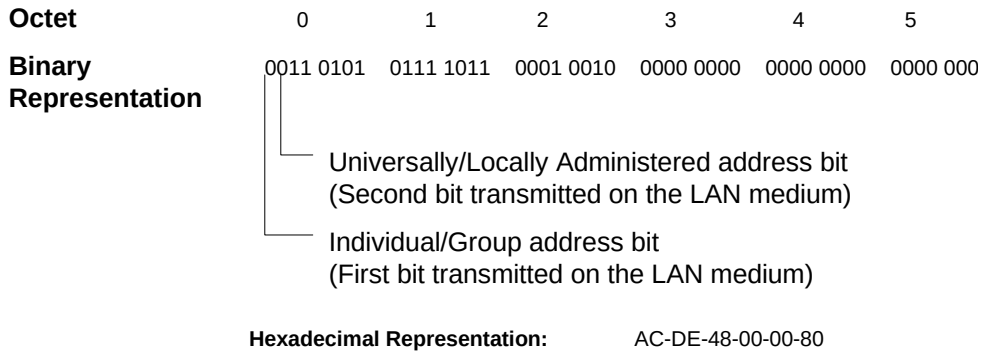

Figure 1 — Representation of LAN MAC Addresses

The 48-bit address (universal or local) is represented as a string of six octets. The octets are displayed from left to right, in the order that they are transmitted on the LAN medium, separated by hyphens. Each octet of the address is displayed as two hexadecimal digits. The bits within the octets are transmitted on the LAN medium from left to right. In the Binary Representation the first bit transmitted, of each octet, on the LAN medium is the least significant bit of that octet. The Individual/Group address bit is the least significant bit. The left-most bit of the Binary Representation (Individual/Group address bit) of a MAC address distinguishes individual from group addresses. The Universally/Locally administered address bit is the next bit following the Individual/Group address bit. The U/L bit indicates whether the MAC address has been universally or locally assigned.

For the previous example, the first octet transmitted is AC and the last octet transmitted is 80. The first bit transmitted is the low order bit of AC, a zero. The last bit transmitted is the high order bit of 80, a one.

5 Standard Group MAC Addresses

5.1 General

All MAC protocol data units contain addressing information. The addressing information consists of two fields: the destination MAC address and the source MAC address. Both of these address fields are 48-bit fields; the structure and semantics of the address field are defined in ISO/IEC 15802-1. Standard Group MAC Addresses are MAC addresses that have been allocated for use by standard protocols and consist of the following four sets of MAC Group Addresses:

— ISO/IEC 15802-3 MAC Bridge Filtered MAC Group Addresses,

— Standard MAC Group Addresses,

— MAC Group Addresses used in ISO 9542, and

— Token Ring LAN Functional Addresses.

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These four sets of MAC Group Addresses are described in sections 5.2 to 5.4.

5.2 MAC Bridge Filtered MAC Group Addresses and Standard MAC Group Addresses

The following 48-Bit Universal Address Block has been allocated for use by standard protocols:

0X-80-C2-00-00-00 to 0X-80-C2-FF-FF-FF

where X has the hexadecimal value:

0 for individual addresses, and

1 for group addresses.

The group address block has been divided into two categories:

ISO/IEC 15802-3 MAC Bridge Filtered MAC Group Addresses: 01-80-C2-00-00-00 to 01-80-C2-00-00-0F; MAC frames which have a destination MAC address within this range are not relayed by MAC bridges.

Standard MAC Group Addresses: 01-80-C2-00-00-10 to 01-80-C2-FF-FF-FF; MAC frames which have a destination MAC address within this range may be relayed by MAC bridges.

5.3 MAC Group Addresses used in ISO 9542

Prior to the allocation of a 48-Bit Universal Address for use by standard protocols the following two Group MAC Address values were assigned, in perpetuity to ISO, for use in ISO 9542.

MAC Group Addresses used in ISO 9542:

09-00-2B-00-00-04 and 09-00-2B-00-00-05

5.4 Token Ring LAN Functional Addresses

Due to limitations in existing intermediate systems and end systems that implement

ISO/IEC 8802-5 it is necessary to allocate several "functional addresses", (see figure 2), that correspond to Standard Group MAC Addresses for use with ISO 9542 when operating on an ISO/IEC 8802-5 Local Area Network. Potential users of these addresses should be aware that, since these addresses are derived from the locally administered address space, there are no guarantees that the addresses will be used only for the listed purposes.

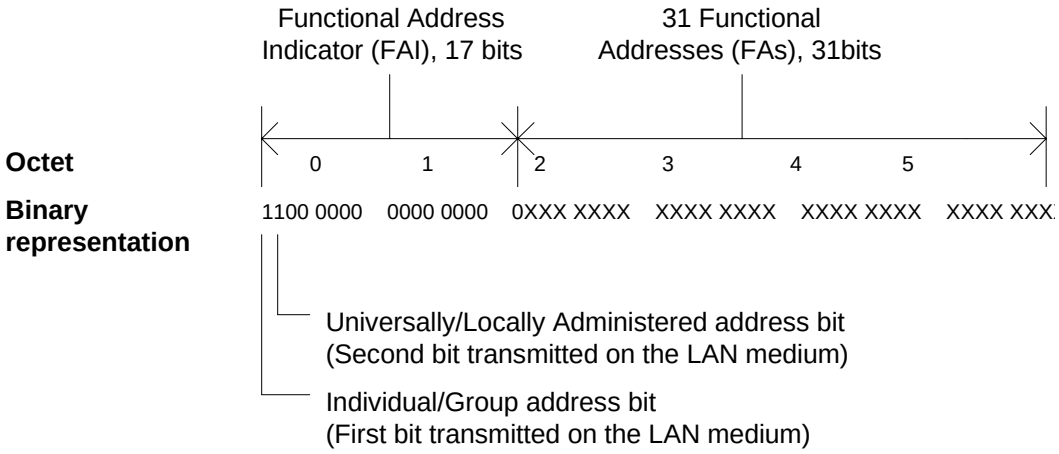

Figure 2 — Representation of Token Ring LAN Functional Addresses

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NOTE Functional Addresses are defined in ISO/IEC 8802-5.

5.5 Criteria for assignment of Standard Group MAC Addresses

5.5.1 General considerations

Unlike LLC reserved addresses Standard Group MAC Addresses are not a scarce resource. However, out of the range of Standard Group MAC Addresses only 16 addresses have been reserved that are not relayed by MAC Bridges (MAC Bridge Filtered MAC Group Addresses). Therefore these 16 values are considered a scarce resource.

Assignment of Standard Group MAC Addresses are made in perpetuity.

5.5.2 Specific considerations

The specific process to follow to request an address assignment can be found at http://standards.ieee.org/regauth/llc/index.html, together with a list of assigned addresses.

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