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

Part 2:
Standard Group MAC Addresses

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Réseaux locaux et métropolitains —

Partie 2: Adresses du groupe MAC normalisées

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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 3.

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.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC TR 11802 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

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 fifth edition cancels and replaces the fourth edition (ISO/IEC TR 11802-2:1999), 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*:

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

— *Part 2: Standard Group MAC Addresses*

— *Part 5: Media Access Control (MAC) Bridging of Ethernet V2.0 in Local Area Networks*

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 Standards. This part of ISO/IEC TR 11802 contains a description of the MAC addressing conventions, the criteria which will be used by ISO/IEC when considering a request for an assignment, and a record of assignments.

This part of ISO/IEC TR 11802 will be kept up to date by ISO/IEC JTC 1 as new assignments are made.

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

Part 2:
Standard Group MAC Addresses

1 Scope

This part of ISO/IEC TR 11802 provides:

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

b) 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.

c) The criteria for the manner in which new addresses are approved for entry into this part of ISO/IEC TR 11802.

d) A record of approved assignments from the Standard Group MAC Address Block and a record of Group MAC Addresses in use in standards which are not part of the Standard Group MAC Address Block, for example ISO 9542.

2 References

ISO/IEC 8802-5:1998, *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 9542:1988, *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 8473)*

ISO/IEC 15802-1:1995, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Common specifications — Part 1: Medium Access Control (MAC) service definition*

ISO/IEC 15802-3:1998, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Common specifications — Part 3: Media Access Control (MAC) Bridges*

Standards which are identified in Tables 1 to 4, in clause 6, but which are not referenced elsewhere in this part of ISO/IEC TR 11802 have not been included in this clause in order to prevent this clause becoming larger than the rest of the document.

3   Abbreviations

The following abbreviations are used in this part of ISO/IEC TR 11802.

MAC   Medium Access Control

LAN   Local Area Network

LLC   Logical Link Control

ANSI   American National Standards Institute

IEEE   Institute of Electrical and Electronics 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 10039 and is used throughout this part of ISO/IEC TR 11802.

Figure 1 illustrates an example of a 48-bit LAN MAC address in both Binary and Hexadecimal Representations.
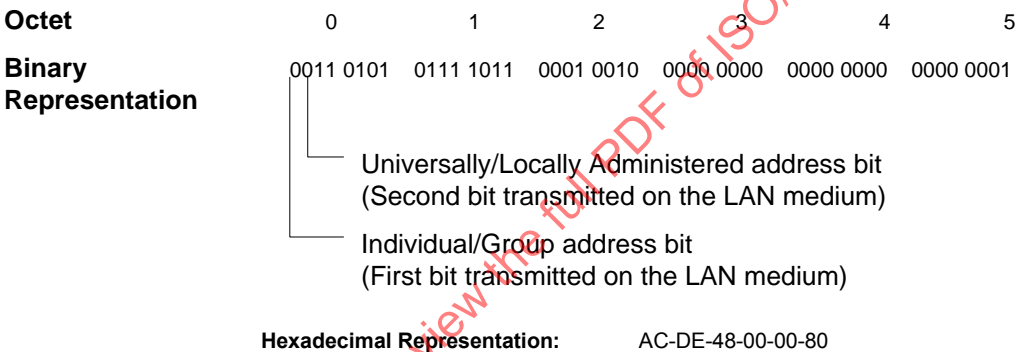
Octet	0	1	2	3	4	5
Binary Representation	0011 0101	0111 1011	0001 0010	0000 0000	0000 0000	0000 0001

Universally/Locally Administered address bit
(Second bit transmitted on the LAN medium)

Individual/Group address bit
(First bit transmitted on the LAN medium)

Hexadecimal Representation: AC-DE-48-00-00-80

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 10039.

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 10038 MAC Bridge Filtered MAC Group Addresses,

- Standard MAC Group Addresses,

- MAC Group Addresses used in ISO 9542, and

- Token Ring LAN Functional Addresses.

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

5.2   ISO/IEC 10038 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 10038 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 conforming to ISO/IEC 10038, see Table 1.

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 (ISO/IEC 10038), see Table 2.

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, see Table 3.

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, see Table 4.

Functional Address
Indicator (FAI), 17 bits

31 Functional
Addresses (FAs), 31bits

Octet

| 0 | 1 | 2 | 3 | 4 | 5 |

Binary representation

1100 0000   0000 0000   0XXX XXXX   XXXX XXXX   XXXX XXXX   XXXX XXXX

Universally/Locally Administered address bit
(Second bit transmitted on the LAN medium)

Individual/Group address bit
(First bit transmitted on the LAN medium)
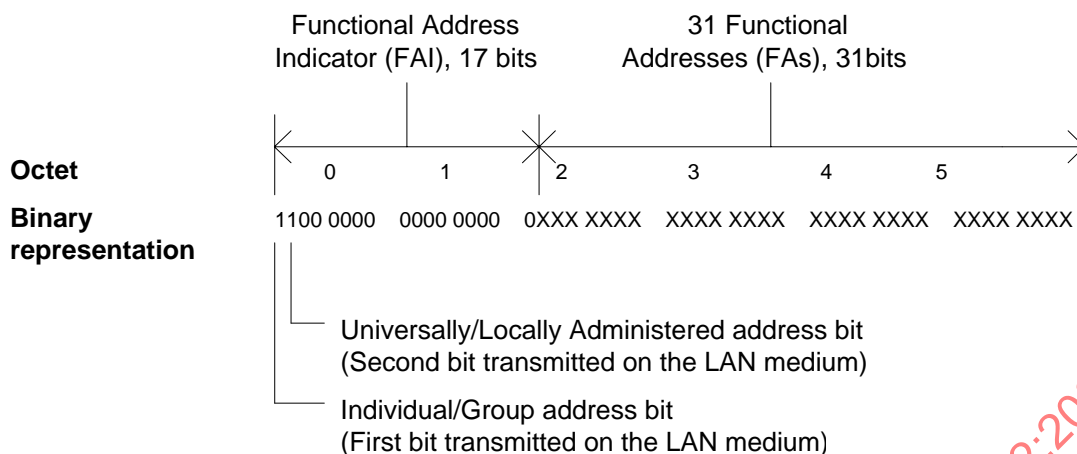
NOTE   Functional Addresses are defined in ISO/IEC 8802-5.

Figure 2 — Representation of Token Ring LAN Functional Addresses

Clause 6 contains all the reserved values that have been assigned together with additional information regarding the assignment.

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 (ISO/IEC 10038 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.

A case-by-case review against the criteria for assignment is made before assignment of a Standard Group MAC Address to a standard protocol and inclusion of that assignment in clause 6.

See also Annex A of this part of ISO/IEC TR 11802.

5.5.2 Specific considerations

A need for a protocol to be assigned a reserved value and included in clause 6 is brought to the attention of ISO/IEC JTC1 by means of a submission to the appropriate subcommittee, currently SC6 WG1. SC6 submissions can be made by members of the SC (that is, members as defined in ISO/IEC directives - currently designated P-, L-, O-, and S- members), and by technical committees and subcommittees of ISO and IEC (including SC6 itself). A request for a reserved value must be accompanied by a copy of the protocol standard.

The proposed protocol should be one which:

- is a standard published by a standards organization whose publications are made following consultation for its technical development and are generally available;

- has a potentially large field of application.

Group MAC addresses for vendor specific proprietary protocols should be assigned out of the vendor's Universally Administered Address Block, for more information refer to ISO/IEC 10039.

6 Standard Group MAC Address assignments

6.1 ISO/IEC 10038 MAC Bridge Filtered MAC Group Addresses

Table 1 — ISO/IEC 10038 MAC Bridge Filtered MAC Group Addresses

Group MAC Address value	Organization using the value	Use being made of the value	Notes
01-80-C2-00-00-00	ISO/IEC JTC1/SC6	ISO/IEC 10038 (IEEE 802.1D)	1
01-80-C2-00-00-01	IEEE 802	IEEE 802.3	2
01-80-C2-00-00-02	*unassigned*		
01-80-C2-00-00-03	*unassigned*		
01-80-C2-00-00-04	*unassigned*		
01-80-C2-00-00-05	*unassigned*		
01-80-C2-00-00-06	*unassigned*		
01-80-C2-00-00-07	*unassigned*		
01-80-C2-00-00-08	*unassigned*		
01-80-C2-00-00-09	*unassigned*		
01-80-C2-00-00-0A	*unassigned*		
01-80-C2-00-00-0B	*unassigned*		
01-80-C2-00-00-0C	*unassigned*		
01-80-C2-00-00-0D	*unassigned*		
01-80-C2-00-00-0E	*unassigned*		
01-80-C2-00-00-0F	*unassigned*		

NOTE 1   Used in ISO/IEC 10038 as the Bridge Group Address.

NOTE 2   Used in IEEE 802.3 to support Flow Control.

6.2 Standard MAC Group Addresses

Table 2 — Standard MAC Group Addresses

Group MAC Address value	Organization using the Value	Use being made of the value	Note
01-80-C2-00-00-10	ISO/IEC JTC1/SC6	ISO/IEC 10038	1
01-80-C2-00-00-11	ISO/IEC JTC1/SC6	ISO/IEC 15802-4 (IEEE 802.1E)	2
01-80-C2-00-00-12	ISO/IEC JTC1/SC6	ISO/IEC 15802-4 (IEEE 802.1E)	3
01-80-C2-00-00-13	*unassigned*		
01-80-C2-00-00-14	ISO/IEC JTC1/SC6	ISO/IEC 10589	4
01-80-C2-00-00-15	ISO/IEC JTC1/SC6	ISO/IEC 10589	5
01-80-C2-00-00-16	ISO/IEC JTC1/SC6	ISO/IEC 10030	6
01-80-C2-00-00-17	ISO/IEC JTC1/SC6	ISO/IEC 10030	7
01-80-C2-00-00-18	ISO/IEC JTC1/SC6	ISO/IEC 15802-2 (IEEE 802.1B)	8
01-80-C2-00-00-19	*unassigned*		
01-80-C2-00-00-1A	ISO/IEC JTC1/SC6	ISO/IEC 15802-2 (IEEE 802.1B)	9
01-80-C2-00-00-1B	ISO/IEC JTC1/SC6	ISO/IEC 9542	15
01-80-C2-00-00-1C	ISO/IEC JTC1/SC6	ISO/IEC 9542	16
01-80-C2-00-00-1D	ISO/IEC JTC1/SC6	ISO/IEC 9542	17
01-80-C2-00-00-1E	ISO/IEC JTC1/SC6	ISO/IEC 8802-5	18
01-80-C2-00-00-1F	*unassigned*		
01-80-C2-00-00-20	ISO/IEC JTC1/SC6	ISO/IEC 15802-3	19
01-80-C2-00-00-21	IEEE 802	IEEE 802.1Q	20
01-80-C2-00-00-22 to 01-80-C2-00-00-2F	IEEE 802	reserved for IEEE 802 use	21
01-80-C2-00-00-30 to 01-80-C2-00-00-FF	*unassigned*		
01-80-C2-00-01-00	ISO/IEC JTC1/SC25	ISO/IEC 9314-6	10
01-80-C2-00-01-01 to 01-80-C2-00-01-0F	ISO/IEC JTC1/SC25	reserved for SC25 use	11
01-80-C2-00-01-10	ISO/IEC JTC1/SC25	ISO/IEC 9314-6	12
01-80-C2-00-01-11 to 01-80-C2-00-01-1F	ISO/IEC JTC1/SC25	reserved for SC25 use	11
01-80-C2-00-01-20	ISO/IEC JTC1/SC25	ISO/IEC 9314-2	13
01-80-C2-00-01-21 to 01-80-C2-00-01-2F	ISO/IEC JTC1/SC25	reserved for SC25 use	11
01-80-C2-00-01-30	ISO/IEC JTC1/SC25	ISO/IEC 9314-6	14
01-80-C2-00-01-31 to 01-80-C2-00-01-FF	ISO/IEC JTC1/SC25	reserved for SC25 use	11
01-80-C2-00-02-00 to 01-80-C2-00-02-FF	ETSI	reserved for ETSI use	22
01-80-C2-00-03-00 to 01-80-C2-FF-FF-FF	*unassigned*		