IEEE Std 802b™-2004
(Amendment to IEEE Std 802®-2001,
as amended by IEEE Std 802a™-2003)

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IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture

Amendment 2: Registration of Object Identifiers

IEEE Computer Society

Sponsored by the
LAN/MAN Standards Committee

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of the
IEEE Computer Society

Approved 25 March 2004
IEEE-SA Standards Board

Abstract: IEEE Std 802-2001, IEEE Local and Metropolitan Area Networks: Overview and Architecture, provides an overview to the family of IEEE 802 standards. This amendment to IEEE Std 802-2001 specifies an Object Identifier hierarchy used within IEEE 802 for uniform allocation of Object Identifiers used in IEEE 802 standards.
Keywords: Local Area Networks (LANs), Metropolitan Area Networks (MANs), LAN/MAN architecture, LAN/MAN reference model, Object Identifiers

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Introduction

(This introduction is not part of IEEE 802b-2004, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture—Amendment 2: Registration of Object Identifiers).

IEEE Std 802b-2004

IEEE Std 802 provides an overview to the family of IEEE 802 standards, describes the relationship of the IEEE 802 standards to the Open Systems Interconnection Basic Reference Model [ISO/IEC 7498-1: 1994] and explains the relationship of these standards to higher layer protocols, provides a standard for the structure of LAN MAC addresses, and provides a standard for the identification of public, private, and standard protocols. This amendment to IEEE Std 802-2001 defines an Object Identifier hierarchy used within IEEE 802 for uniform allocation of Object Identifiers used in IEEE 802 standards.

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IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture

Amendment 2: Registration of Object Identifiers

[This amendment to IEEE Std 802®-2001 defines the changes necessary in order to define an Object Identifier hierarchy used within IEEE 802 for uniform allocation of Object Identifiers used in IEEE 802 standards. These changes are defined as a series of additions to, and modifications of, the existing text of IEEE Std 802-2001; this amendment therefore assumes all material, including references, abbreviations, definitions, procedures, services and protocols defined in the base text.]

NOTE—The editing instructions contained in this amendment define how to merge the material contained herein into the existing base standard to form the comprehensive standard.

Text shown in ***bold italics*** in this amendment defines the editing instructions necessary in order to incorporate the modifications and additions into the base text. Three editing instructions are used: ***change, delete,*** and ***insert***. ***Change*** is used to make a change to existing material. The editing instruction specifies the location of the change and describes what is being changed either by using ~~strikethrough~~ (to remove old material) or underscore (to add new material). ***Delete*** removes existing material. ***Insert*** adds new material without changing the existing material. Insertions may require renumbering. If so, renumbering instructions are given in the editing instruction. Editorial notes will not be carried over into future editions of IEEE Std 802.

Change the Abstract and Keywords in the front matter of IEEE Std 802-2001 as follows:

Abstract: IEEE Std 802-2001, IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture, provides an overview to the family of IEEE 802 standards. It describes the relationship of the IEEE 802 standards to the Open Systems Interconnection Basic Reference Model [ISO/IEC 7498-1:1994] and explains the relationship of these standards to the higher layer protocols; it provides a standard for the structure of LAN MAC addresses; it provides a standard for identification of public, private, prototype, and standard protocols; and it defines an Object Identifer hiearchy used within IEEE 802 for uniform allocation of Object Identifiers used in IEEE 802 standards.

Keywords: IEEE 802 Local Area Networks (LANs), LAN/MAN architecture, LAN/MAN reference model, Metropolitan Area Networks (MANs), Protocol development, Ethertypes, Object Identifiers.

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1. Scope

1.1 General

Change the text of subclause 1.1 as shown below:

This document serves as the foundation for the family of IEEE 802 standards published by IEEE for Local Area Networks (LANs) and Metropolitan Area Networks (MANs). It contains descriptions of the networks considered as well as a reference model (RM) for protocol standards. A standard for the identification of public, private, prototype, and standard protocols is included, using either Ethertype values or LLC addresses. An Object Identifier hierarchy is defined, for use within IEEE 802 to ensure uniform allocation of Object Identifiers within IEEE 802 standards.

2. References

Add the following reference to Clause 2, References:

ISO/IEC 8824:1990, Information technology—Open systems interconnection—Specification of Abstract Syntax Notation One (ASN.1)

Insert the following clause as a new Clause 13:

13. Allocation of Object Identifier values in IEEE 802 standards

From time to time, various IEEE 802 standards have a requirement to allocate Object Identifier values—the most common example being for the purpose of defining SNMP MIBs, but other examples exist. This clause defines a simple and consistent Object Identifier hierarchy, based on the use of the Object Identifier value that has been assigned by ISO to identify the ISO/IEC 8802 series of standards. This hierarchy can be used by all current and future IEEE 802 Working Groups, and can be used flexibly to meet the needs of the standards defined by those working groups. This will establish a consistent practice within IEEE 802 for the development and allocation of object identifiers. Consistency of Object Identifier allocation will facilitate implementation and operation of IEEE 802 compliant equipment.

13.1 Object Identifiers and ISO standards

An Object Identifier is an ASN.1 data type that is used as a means of defining unique identifiers for objects. Values of the Object Identifier data type can then be used to name the objects to which they relate.

The Object Identifier data type consists of a sequence of one or more non-negative integers, often referred to as arcs, that define a hierarchy, or tree, of object identifier values. The first arc in the sequence identifies the registration authority responsible for allocating the values of the second and subsequent arcs. For example:

iso(1)

indicates that an initial arc value of 1 identifies ISO as the registration authority. Subsequent arcs in the sequence will have been determined by ISO, or will have been allocated by registration authorities subordinate to ISO.

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Under the iso arc, a second arc of zero has been allocated to identify standards; hence, the two-integer sequence

iso(1) std(0)

indicates that the third integer is used to identify a particular ISO standard. The actual standard number is used in the third arc; hence:

iso(1) std(0) iso8802(8802)

identifies ISO/IEC 8802.

The responsibility for allocating the fourth and subsequent arcs under iso(1) std(0) iso8802(8802) lies with the standard concerned.

As ISO/IEC 8802 is the ISO/IEC standard number used to identify the ISO/IEC versions of the family of IEEE 802 LAN/MAN standards, this particular sequence of integer values can form the basis of an Object Identifier hierarchy for use by the individual standards in the 8802 family. The act of assigning an ISO standard number to a standard has the effect of automatically assigning an OID arc to that standard, and therefore no further administrative effort is needed before that standard can allocate OID values under that point in the tree, using the fourth and subsequent arcs.

The iso(1) std(0) iso8802(8802) arc assignment can be used by all members of the family of IEEE 802 standards, without regard to whether or not IEEE 802.n standards are forwarded to ISO/IEC for international standardization in the 8802 series.

13.2 The Object Identifier hierarchy under iso(1) std(0) iso8802(8802)

The Object Identifier value assigned to the 8802 series of standards is:

iso(1) std(0) iso8802(8802)

The next arc in the sequence shall be used to differentiate between members of the IEEE 802 family of standards, by using it as a working group designator, as follows:

iso(1) std(0) iso8802(8802) ieee802dotXX(XX)

where XX is the working group number of the IEEE 802 Working Group responsible for that standard. These arcs are assigned for use in all current and future IEEE 802.XX standards, without regard to whether or not those standards are forwarded to ISO/IEC for international standardization in the 8802 series.

For example, under this hierarchy, the value used within the standards defined by the IEEE 802.1™ Working Group is:

iso(1) std(0) iso8802(8802) ieee802dot1(1)

and the value used within the IEEE 802.3™ standards is:

iso(1) std(0) iso8802(8802) ieee802dot3(3)

The working group concerned is free to decide how further arcs will be allocated within their standards, in a manner that makes sense for their particular needs. For example, in the IEEE 802.1 Working Group, the fifth

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arc is used to define the type of allocations that are being made. The only type defined so far is for MIBs, but others can be added in the future:

iso(1) std(0) iso8802(8802) ieee802dot1(1) ieee802dot1mibs(1)

Below this arc, each individual IEEE 802.1 MIB can get its own identifier. Again, only IEEE 802.1X's MIB (ieee8021paeMIB) appears in this scheme so far, but clearly others can easily be added:

iso(1) std(0) iso8802(8802) ieee802dot1(1) ieee802dot1mibs(1) ieee8021paeMIB(1)

It is the responsibility of each working group to ensure that any values that are allocated to the fifth and subsequent arcs are documented, in a manner that ensures that the same OID value cannot be assigned to two different objects. In the IEEE 802.1 Working Group, this has been achieved in the past by placing tables of OID allocations in an annex within the standard concerned; in the IEEE 802.3 Working Group, a master spreadsheet of allocated OID values is maintained by the Chair and posted on their website. For future allocations, adopting a master spreadsheet approach is appropriate.

It is important that the allocation scheme for the fifth and subsequent arcs is constructed in a manner that leaves appropriate "escapes" for uses that cannot be foreseen. The simple expedient of allocating a "type of allocation" value as the fifth arc (as in the IEEE 802.1 Working Group usage described above) is sufficient to ensure that such an escape is always available.

13.3 Migration from previous Object Identifier allocations

The Object Identifier hierarchy described in this clause need not have any effect upon existing IEEE 802 standards that have already solved this problem by using a specific allocation obtained elsewhere (for example, from ANSI). The primary aims of documenting this procedure are:

a) To ensure that Object Identifiers can be allocated under iso(1) std(0) iso8802(8802) in a manner that ensures that they are unique, and

b) To avoid the need for any further administrative overhead (such as applying for the use of an Object Identifier arc) for any future uses of Object Identifiers in IEEE 802 standards.

With the hierarchy as defined in this clause, as new working groups are created in IEEE 802, their base Object Identifier arc is also created automatically, so no administrative effort is required on the part of the working group, other than to determine how the fifth and subsequent arcs will be used in their standards.

For those working groups that have already made use of other allocation schemes (IEEE 802.3 and IEEE 802.1 are both examples), it may be considered appropriate to migrate existing allocations to the hierarchy defined in this clause. In considering this, the following should be borne in mind:

c) While it might be perceived as "tidy" to have all IEEE 802 Object Identifiers allocated under a single arc of the Object Identifier tree, this is not a requirement for any other reason; one Object Identifier value is no better or no worse than any other from a technical point of view, as long as any given Object Identifier identifies a single object.

d) If migration is desired, there is no requirement to remove the old Object Identifier values; indeed, this is not permitted for objects defined in SNMP MIB modules, nor is it permitted to associate such objects with more than one Object Identifier value. Instead, new definitions shall be created and registered under the desired Object Identifier tree.

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