

IEEE Navigational Bar

IEEE Standards Navigation Bar

Guidelines for use of a 48-bit Extended Unique Identifier (EUI-48™)

General

The IEEE defined 48-bit extended unique identifier (EUI-48™) is a concatenation of a 24-bit Organizationally Unique Identifier (OUI) value administered by the IEEE Registration Authority and a 24-bit extension identifier assigned by the organization with that OUI assignment.

The IEEE administers the assignment of 24-bit OUI values. The assignments of these values are public, so that a user of an EUI-48 value can identify the manufacturer that provided the value h[1]. The IEEE/RAC has no control over the assignments of 24-bit extension identifiers and assumes no liability for assignments of duplicate EUI-48 identifiers assigned by manufacturers.

Application restrictions

Given the possibility of consuming all the EUI-48 identifiers, the IEEE/RAC places restrictions on their use. For new applications, EUI-48 identifiers are restricted to use in low volume applications, such as the identification of software interface standards or hardware model numbers.

While the number of EUI-48 identifiers is large, it is not inexhaustible, and an extended EUI-64 is available. Applications that use the EUI-48 identifier may require special review by the IEEE/RAC. See the *UseOfEUI* tutorial, *MAC-48 identifier restrictions*, for details.

The term EUI-48 is trademarked by the IEEE. Companies are allowed to use this term for commercial purposes, but only if their use of this term has been reviewed by the IEEE/RAC and the proposed products using the EUI-48 conform to these restrictions.

Manufacturer-assigned identifiers

The manufacturer identifier assignment allows the assignee to generate approximately 16 million unique EUI-48 values, by varying the last 24 bits. The IEEE intends not to assign another OUI value to a manufacturer of EUI-48 values until the manufacturer has consumed, in product, the preponderance (more than 90%) of this block. It is incumbent upon the manufacturer to ensure that large portions of the block are not left unused in manufacturing.

48-BIT EXTENDED UNIQUE IDENTIFIER FORMAT TUTORIAL

General

The IEEE defined 48-bit global identifier (EUI-48) is assigned by a manufacturer who has been assigned an OUI value by the IEEE Registration Authority. The 48-bit identifier is a concatenation of a 24-bit OUI value assigned by the IEEE Registration Authority and a 24 bit extension identifier assigned by the organization with that OUI assignment.

The IEEE administers the assignments of 24-bit OUI values. The assignments of these values are public, so that a user of a EUI-48 value can identify the manufacturer that provided the value. The IEEE has no control over the assignments of 24-bit extension identifiers and assumes no liability for assignments of duplicate EUI-48 identifiers.

Distribution restrictions

The IEEE has no established policies on the redistribution of EUI-48 values or range of values through third parties.

OUI based identifier sequence

An OUI based 48-bit global identifier (EUI-48) consists of two portions. The 24-bit first portion of this value is the OUI value assigned to the manufacturer by the IEEE Registration Authority. The 24-bit second portion of this identifier is assigned by the manufacturer.

For example, assume that a manufacturer's IEEE-assigned OUI value is AC-DE-48 and the manufacturer-selected extension identifier for a given component is 23-45-67. The EUI-48 value generated from these two numbers is AC-DE-48-23-45-67.

Some standards specify an EUI-48 by a string of six bytes, labeled here as *eui*[0] through *eui*[5]. For those standards, the format of the EUI-48 is illustrated below. Although different standards may specify different bit-transmission orders, bytes are normally transmitted in an ascending index-value order.

Value: AC-DE-48-23-45-67

OUI			extension identifier			field
<i>eui</i> [0]	<i>eui</i> [1]	<i>eui</i> [2]	<i>eui</i> [3]	<i>eui</i> [4]	<i>eui</i> [5]	order
AC	DE	48	23	45	67	byte

OUI-36 based based EUI-48 identifiers

A 36-bit Organizationally Unique Identifier (OUI-36) based 48-bit global identifier (EUI-48) consists of two portions. The 36-bit first portion of this value is specified by the OUI-36 value assigned to the manufacturer by the IEEE Registration Authority; the 12-bit second portion of this identifier is assigned by the manufacturer.

For example, assume that a manufacturer's IEEE-assigned OUI-36 value is AC-DE-48-23-4 and the manufacturer-selected extension identifier for a given component is 5-67. The EUI-48 value generated from these two numbers is AC-DE-48-23-45-67.

Some standards specify an EUI-48 by a string of six bytes, labeled here as *eui*[0] through *eui*[5]. For those standards, the format of the EUI-48 is illustrated below. Although different standards may specify different bit-transmission orders, bytes are normally transmitted in an ascending index-value order.

```
IAB:          AC-DE-48-23-40-00(smallest) through
              AC-DE-48-23-4F-FF(largest)
extension:    5-67
EUI-48:      AC-DE-48-23-45-67
```

Value: AC-DE-48-23-45-67

OUI-36				extension		field
eui[0]	eui[1]	eui[2]	eui[3]	eui[4]	eui[5]	order
AC	DE	48	23	45	67	byte

Numerical formats

Other standards specify an EUI-48 to be a numerical value, upon which computations (such as base/bounds or bit selections) can be performed. For those standards, the format of the EUI-48 is illustrated below:

Value: ACDE48234567₁₆

OUI			extension identifier			field
AC	DE	48	23	45	67	hex
AC	DE	48	23	45	67	hex

[1]Except for private OUI values, where the owner of the OUI value is confidential. These remain private.

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URL: <http://standards.ieee.org/regauth/oui/tutorials/EUI48.html>

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