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 either a 24-bit Organizationally Unique Identifier (OUI) value administered by the IEEE Registration Authority (IEEE-RA) and a 24-bit extension identifier assigned by the organization with that OUI assignment, or the concatenation of a 36-bit Individual Address Block (IAB) identifier /or 36-bit Organizationally Unique Identifier (OUI-36)/ and a 12-bit extension identifier assigned by the organization with that IAB assignment.

IEEE administers the assignment of 24-bit OUI values and 36-bit OUI-36/IAB identifiers. 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 or 12-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 Use Of EUI tutorial, MAC-48 identifier restrictions, for details.

Manufacturer-Assigned Identifiers

The manufacturer identifier assignment allows the assignee of an OUI to generate approximately 16 million unique EUI-48 values, by varying the last 24 bits, and allows the assignee of an OUI-36/IAB to generate 4096 unique EUI-48 values, by varying the last 12 bits. IEEE intends not to assign another OUI or OUI-36/IAB value to a manufacturer of EUI-48 values until the manufacturer has consumed, in product, the preponderance (more than 90%) of the previously assigned 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 or OUI-36/IAB value by the IEEE-RA. The 48-bit identifier is a concatenation of a 24-bit OUI value assigned by the IEEE-RA and a 24 bit extension identifier assigned by the organization with that OUI assignment, or a concatenation of a 36-bit OUI-36/IAB identifier assigned by the IEEE-RA and a 12 bit extension identifier assigned by the organization with that OUI-36/IAB assignment.

IEEE administers the assignments of 24-bit OUI values and 36-bit OUI-36/IAB identifiers. The assignments of these values are public, so that a user of a EUI-48 value can identify the manufacturer that provided the value. 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

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
eui[0]	eui[1]	eui[2]	eui[3]	eui[4]	eui[5]	order
AC	DE	48	23	45	67	byte

IAB Based Identifiers

An oui-36/individual address block (OUI-36/IAB) 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/IAB base value assigned to the manufacturer by the IEEE-RA; the 12-bit second portion of this identifier is assigned by the manufacturer.

For example, assume that a manufacturer's IEEE-assigned OUI-36/IAB base value is AC-DE-48-23-40-00 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.

OUI-36/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

IAB				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 the 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: $ACDE48234567_{16}$

OUI			extension identifier			field
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.*