IEC / IEEE 60802 - IA profile

Stream DA-MAC constraints to simplify the support of the required number of streams

-To be discussed-

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Basic scope

IEC / IEEE 60802 use case discussion identified the need for up to 16384 streams or even more inside one TSN domain

Ways to simplify the implementation of this number of streams seem to be useful

Principle

Without any rule all devices need to cope with any valid multicast MAC address as stream identifier

Standard FDB implementations use hash tables which need to be overprovisioned to allow, together with a feasible neighborhood of e.g. eight, the guaranteed storage of the required number of DA-MAC addresses

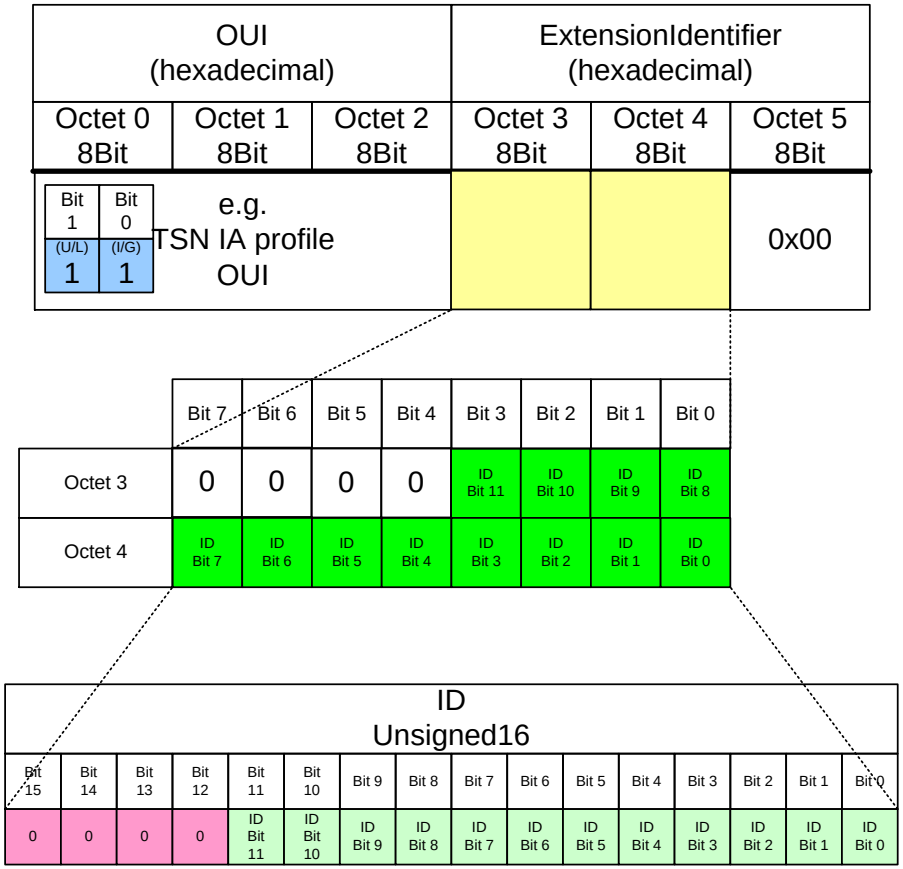
-> Very inefficient for DA-MAC addresses used for streams

Optimization

Using VLANs and TSN domains allows the separation of centralized or distributed controlled Stream-DA-MAC assignment. Thus, rules for the usage of Stream-DA-MAC addresses, e.g. the same range in each TSN domain, may be defined and implemented.

Both, index and hash based solutions should be taken into account.

Example for a solution



where
(U/L) means „Universally or Locally administered address“
(I/G) means „Individual/Group address“
ID means Identificator

Define one OUI together with “L” and “G” flag:=true and chose a range for Extension Identifier e.g. Start and End within the 2^24 possible numbers.

Thus, constraint devices may implement a simple index based search for a stream entry.

Hash based solution may optimize their algorithm to make sure that every value will find an entry to store the forwarding rule.

This example shows a range of 4096 Stream-DA-MACs which could be used together with four VLANs and thus allow 16384 different streams.

Conclusion

The author of this contribution suggests to include such a rule into the TSN IA profile.

Thank you

Questions?