IEEE Registration Authority

OUI Registry Tiers proposal

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Current OUI based identifiers

- Company_id is a 24-bit OUI value assigned by the IEEE-RA
- CDI-32™ is a concatenation of a 24-bit OUI value assigned by the IEEE-RA and an 8-bit extension identifier assigned by the organization with that OUI assignment.
- TCDI-40™ is a concatenation of a 24-bit OUI value assigned by the IEEE-RA and a16-bit extension identifier assigned by the organization with that OUI assignment.
- MAC-48 (obsolete label) / EUI-48™ 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.
- EUI-60 (deprecated) is a concatenation of a 24-bit OUI assigned by the IEEE-RA and a 36-bit extension identifier assigned by the organization with that OUI assignment.
- EUI-64™ is a concatenation of the 24-bit or 36-bit OUI value assigned by the IEEE-RA and a 40-bit or 28-bit extension identifier assigned by the organization with that OUI assignment.
- IPv6 is a concatenation of a 64-bit EUI-64™ (derived from a MAC-48/EUI-48™) and a 64-bit extension identifier assigned by the device with the MAC-48/EUI-48 ™ assignment.

Current creation

Identifier	registry	*OUI:ID*
• Company_id	OUI	*1:1*
• CDI-32	OUI	
• TCDI-40	OUI, OUI36	
• MAC48/EUI48	OUI	*1:16M*
	IAB, OUI36	*1:4K*
• EUI60	OUI	
• EUI64	OUI, OUI36	*1:1T*
• IPv6	OUI, IAB, OUI36	

Some identifiers (e.g., Company_id) can only be created from one registry

Rationale for change

- RAC “Prime directive”
  - Do not run out of global MAC48 addresses for 100 years
    - ~250 billion EUI48 (of ~70 trillion possible) addresses have been assigned
- Volume
  - A few vendors are volume users
    - >32M MAC (EUI-48) addresses assigned per month
  - Most other vendors would prefer a more options as they use less
    - This would reduce “lost” or “unused” addresses
- Virtualization
  - Usage of global MAC (EUI-48) addresses by software
    - Traditionally RAC limited vendors to only a few per hardware device
  - Reuse of global MAC (EUI-48) addresses per rack / cluster / data center
    - Guidance needed, even though this is not permitted
  - Assignment of address blocks to data centers (instead of vendors)
- Future
  - Explore feasibility of “EUI-128” identifier for VMs

Proposal

- Maintain existing OUI & OUI-36 registries
- Create new registries for EUI-48 sizes
  - 16M, 1M, 4K, 1
- Disconnect addresses from Company identifier
  - Assign 24 & 36 bit Company identifiers without addresses
  - Assign these within the “local space”
- Suggest VMs create addresses based on new Company identifiers in the “local space”
  - Resulting in reusable local addresses, with some organization
- Rework pricing structure accordingly…

New Proposed OUI-based Registries

- OUI *existing*
- OUI-36 *existing*
- CompanyID-24
- CompanyID-36
- Addresses-A (48 bit)
- Addresses-B (36 bit)
- Addresses-C (28 bit)
- Addresses-D (24 bit)

Registry	EUI48	EUI64
Addresses-A	1	65536
Addresses-B OUI36	4096	268435456 ~270 million
Addresses-C	1048576 ~1 million	68719476736 ~69 billion
Addresses-D OUI	16777216 ~16 million	1099511627776 ~1 trillion

RAC Proposal – October 2012

- Key Identifiers
  1. 24 bit Company ID
  2. 36 bit Company ID
  3. 48 bit EUI-48 address
  4. 64 bit EUI-64 address
- Existing Registries
  - OUI : 1, 3, 4
  - OUI-36: 2, 3, 4
- New Registries:
  - Addresses Size A: 3, 4
  - Addresses Size B: 3, 4
  - Addresses Size C: 3, 4
  - Addresses Size D: 3, 4
  - Company ID 24 bit: 1
  - Company ID 36 bit: 2

- Alternative A
  - Addresses registries
    - Do not include company ID assignment, they are reserved for other use
  - Company ID registries
    - Do not include address assignments
    - Values taken from address registries

- Alternative B
  - Addresses registries
    - Do not include company ID assignment, they are reserved for IEEE RA (and left unassigned for now)
  - Company ID registries
    - Do not include address assignments
    - Values taken from local space
  - Virtualization
    - Data centers are sold “CompanyIDs” and may use these to create addresses in the local space

Process

- RAC & RAP (sub-groups of the IEEE-SA BOG) working together to develop reorganization of the OUI set of registries
  - Awaiting recommendation from consultant
  - Registry structure proposal will be socialized with customers and WGs seeking feedback on impact
- Evaluate feedback and finalize proposal
  - Discussion during Nov 8th RAC meeting
- BOG would like to approve reorganization and pricing in Dec 2012, or Mar 2013 at the latest

Backup

Current OUI-based Registries

Manufacuter ID	Registry	EUI48 (MAC address)
1 24-bit identifier	OUI	16777216
1 36-bit identifier	OUI36	4096
-	IAB	4096

New Proposed OUI-based Registries

Manufacturer ID	Registry	EUI48 (MAC address)
1 24-bit identifier	OUI	16777216
1 36-bit identifier	OUI36	4096
1 24-bit identifier	CompanyID-24	-
1 36-bit identifier	CompanyID-36	-
-	Addresses-A	1
-	Addresses-B	4096
-	Addresses-C	1048576
-	Addresses-D	16777216