MAC Address Format Issue

Scott Mansfield
Ericsson
MAC Address Format

• IETF and IEEE have different patterns for mac-address
  – IETF Format: pattern '[0-9a-fA-F]{2}(:[0-9a-fA-F]{2}){5}';
    • uses ‘:’ as separator
  – IEEE Format: pattern "[0-9a-fA-F]{2}([-0-9a-fA-F]{2}){5}";
    • uses ‘-’ as separator
    • Also ‘:’ has a defined meaning in IEEE specs (bit-reversal of each hex digit)
    • However the bit-reversal issue is historic (but there really should be an amendment to official recognize that fact)
Not just a ‘-’ or ‘:’ problem

• IEEE definition

• Pattern allows upper and lower case characters but description says uppercase is used.

• IETF definition

• Pattern allows upper and lower case but makes no indication on which is used.
Issue with strings

• mac-address typedef is a string in YANG
• That means when mac-address is used as a key, the format used must match not only the separator (‘:’ or ‘-’) but the case of the character representing the hexadecimal number
Why SNMP is different

• In SNMP a MacAddress was an OCTET STRING of size 6 with a display hint.
• On the wire the MacAddress is treated as a string of octets that are not affected by the display hint or the separator used.
• So AE-12-FF would be the same as ae:12:ff
Co-existence of IETF and IEEE Definitions

• Greping the YANG repository there are places in IEEE where ietf-yang-types is imported.
  – However there are no places where yang:mac-address is used in IEEE

• So there doesn’t seem to be pressing issue --- YET
What to do

• Common wisdom says it is too late to change either the IEEE or IETF definition to use a 6 byte binary array
  – This would fix the “on-the-wire” and key comparison issue
• Identify potential conflicts
  – Modules that use both yang:mac-address and ieee:mac-address and try to compare them
  – Even if only one definition is used, some hints or guidelines should be created because the format of the string (upper/lower case) matters for comparison
• IEEE should start a project to fix the definition of mac-address in ieee802-types.yang
  – Make align the format with the description
  – or as Don suggests
    • “The EtherType value represented in the canonical order defined by IEEE 802. This value can contain uppercase or lowercase alpha hex characters .”
  – Coordinate with IETF and OpenConfig to understand options when comparing IEEE formatted strings and IETF formatted strings