SNAP SAP EtherType

A receive-only protocol

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Receive-only protocol

- Data communication protocols generally use both transmission and reception

- Many real-world protocols are transmit only

- Design of receive-only protocols has been neglected

- This proposal is a first step in remedying that deficiency

SNAP SAP EtherType

- Request for AA-AA EtherType assignment
  - Specific value requests not normally allowed
  - No other value will do

- Purpose/reason for allocation

- The technical issue

- Assign or reserve?

- Protocol definition

- Non-use Example

- Closing thoughts

Purpose/Reason for allocation

Unambiguous protocol identification when EtherType/LLC choice unclear
- e.g. frame length not in frame data
  - » length known as part of storage mechanism
  - » frame decapsulated/detagged from longer frame, possibly originating from different media type

Enhance interoperability by giving EtherType users (the option of) frame enlargement capabilities that LLC users currently enjoy

Technical issue

If a frame
- Starts with AA-AA-03-00-00-00-WX-YZ
- and is an LLC frame

then WX-YZ is an EtherType value

But what if a frame
- Starts with AA-AA-03-00-00-00-WX-YZ
- and started with an EtherType (AA-AA)

EtherType AA-AA is not yet assigned
- Can we, in good conscience, allow assignment?

Assign or reserve

Ensure AA-AA is not accidentally assigned
- Reservation is not a well-used process
- Assignment has to be to something

Assign to 802.1H state
- May need to define associated protocol
- Easiest match to established procedure

Protocol definition for AA-AA EtherType

Reception
- If received in a context requiring EtherType on transmit, discard frame, else
- If octet after AA-AA is not 03 or less than 6 octets follow, discard frame, else
- If AA-AA-03 followed by 00-00-00 following two octets are an EtherType (for remainder), else
- Six octets after AA-AA-03 are SNAP SAP PID

Transmit
- No frames are transmitted for this protocol

Example – correct non-use

FDDI Bridge C-TAGs Ethernet frame
- DA SA AA-AA-03-00-00-00 81-00 C-TCI EtherType ..

FDDI PEB S-TAGs frame correctly
- DA SA AA-AA-03-00-00-00 88-A8 S-TCI 81-00 C-

FDDI-Ethernet PCB forwards frame
- DA SA 88-A8 S-TCI 81-00 C-TCI EtherType Data

Ethernet PEB removes S-TAG
- DA SA 81-00 C-TCI EtherType Data

Ethernet Bridge removes C-TAG to deliver frame
- DA SA EtherType Data

NOTE: C-TCI includes C-VID, Priority, DEI S-TCI includes S-VID, Priority, DEI

Example – incorrect use

FDDI PEB S-TAGs frame incorrectly
– DA SA AA-AA-03-00-00-00 88-A8 S-TCI
AA-AA-03-00-00-00 81-00 C-TCI EtherType ..

FDDI-Ethernet PCB forwards incorrectly tagged frame
– DA SA 88-A8 S-TCI AA-AA-03-00-00-00 81-00 C-TCI
EtherType Data

Ethernet PEB removes S-TAG
– DA SA AA-AA-03-00-00-00 81-00 C-TCI EtherType ..

Ethernet Bridge removes C-TAG, delivers incorrect frame
– DA SA AA-AA-03 EtherType Data

Attempt to handle incorrect use

FDDI-Ethernet PCB forwards incorrectly tagged frame
- DA SA 88-A8 S-TCI AA-AA-03-00-00-00 81-00 C-TCI EtherType Data

Ethernet PEB removes S-TAG
- DA SA AA-AA-03-00-00-00 81-00 C-TCI EtherType ..

Helpful Ethernet Bridge removes SNAP SAP encoded C-TAG, delivers correct frame
- DA SA AA-AA-03 EtherType Data

AA-AA accidentally assigned

FDDI End Station transmits LLC SNAP encoded EtherTyped frame
- – DA SA AA-AA-03-00-00-00 EtherType (AA) Data

FDDI PEB S-TAGs frame correctly, FDDI-Ethernet PCB forwards frame, Ethernet PEB removes S-TAG
- – DA SA EtherType(AA) Data(AA030000008100xxyy...)

- 'Helpful' Ethernet Bridge removes AA AA 03 00 00 00 81 00, incorrectly delivers frame fragment
  - – DA SA EtherType(xx) Data(yy..)

Closing thoughts

Objective is partly to discourage AA EtherType use, part to avoid consequences of proprietary helpful attempts, part to protect an unwitting future assignee of the AA EtherType

Discouraging future use of AA to shift the problem around requires defining 'the protocol'

Discouraging use is at odds with defining what the protocol does