802.1ah Provider Backbone Bridges support for DSLAM

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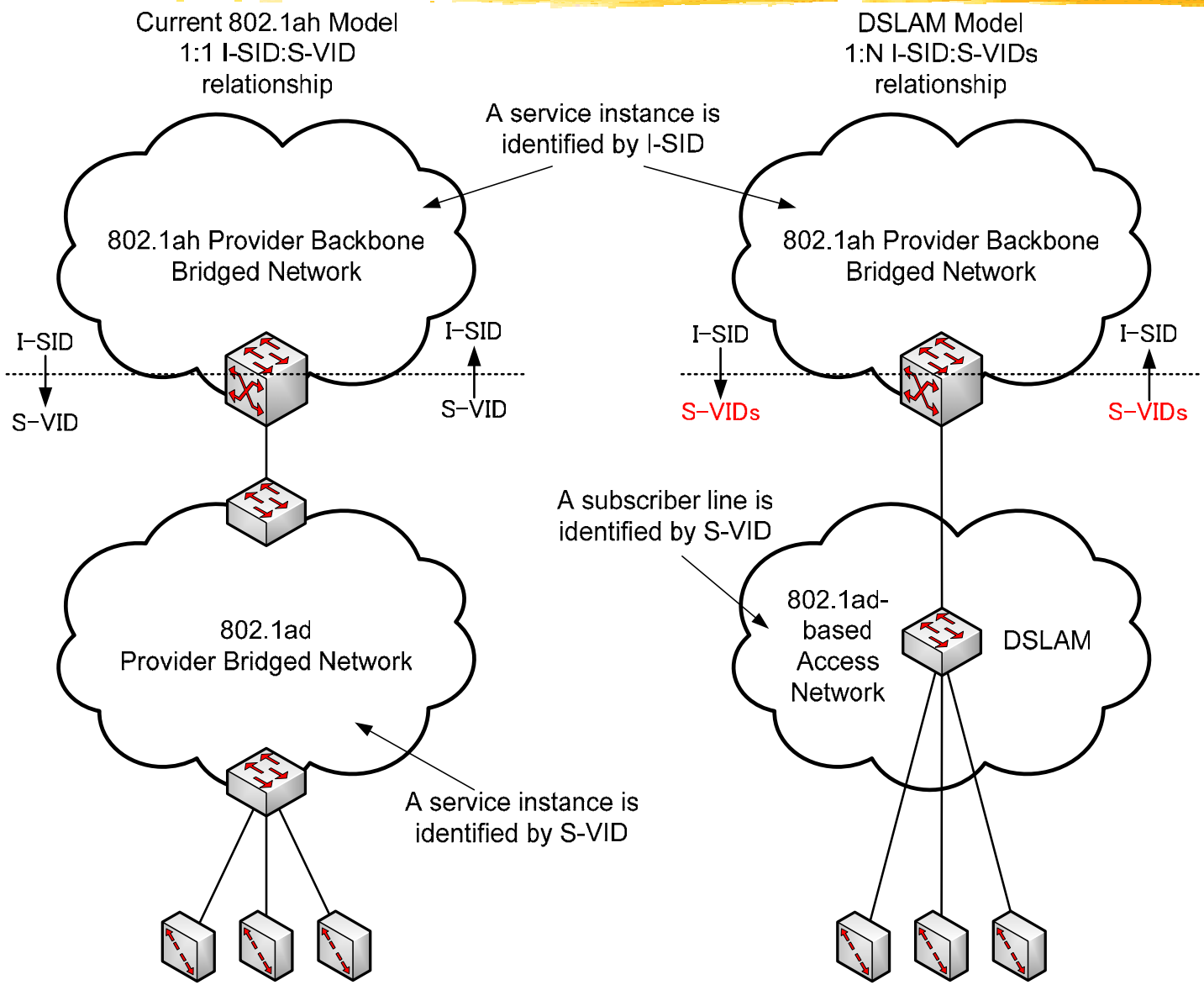
Muneyoshi Suzuki

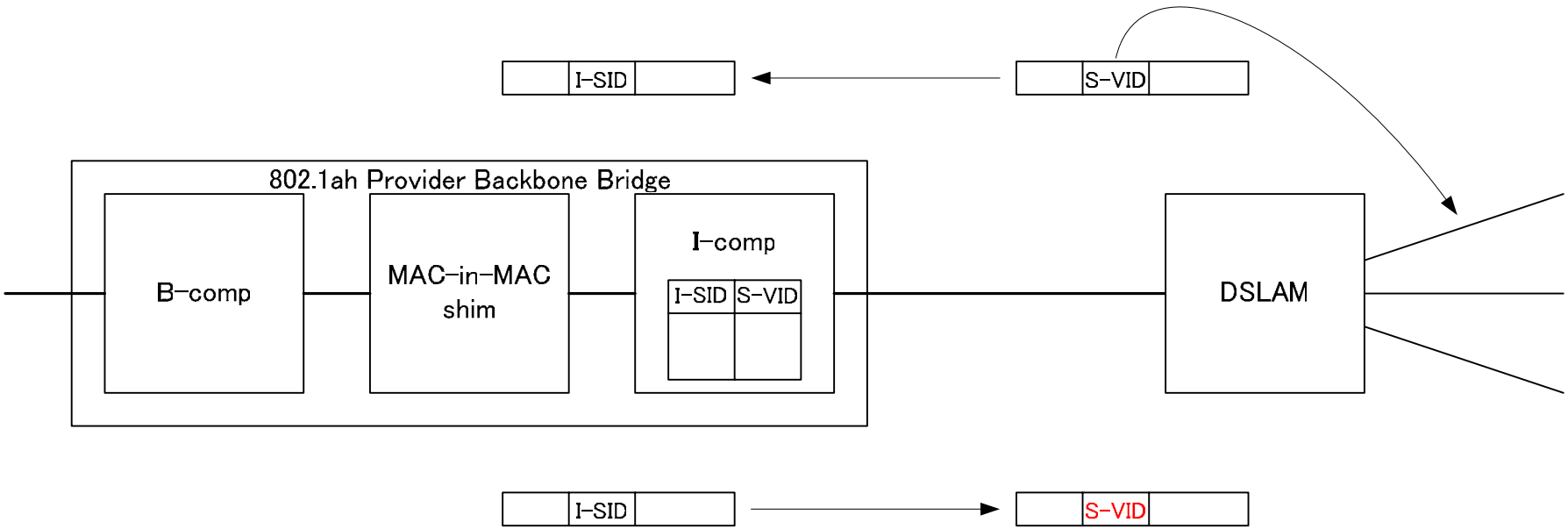
Background

- Customers of metro Ethernet services are mostly business users
- Broadband access is not necessarily for business applications
  - E.g., POS system of chain store
  - xDSL-based access is widely used
- xDSLs are multiplexed by DSLAM then connected to backbone
  - Ethernet frame is used for DSLAM-backbone connection now
- DSLAM-based access network could be modeled as 802.1ad network which supports point-to-point connectivity
  - However, S-VID identify a subscriber line, not a customer
  - Therefore, relationship between I-SID in the backbone and S-VID in a DSLAM-based access network is 1:N
  - So, 802.1ah Provider Backbone Bridges support for DSLAM needs some considerations

DSLAM support model

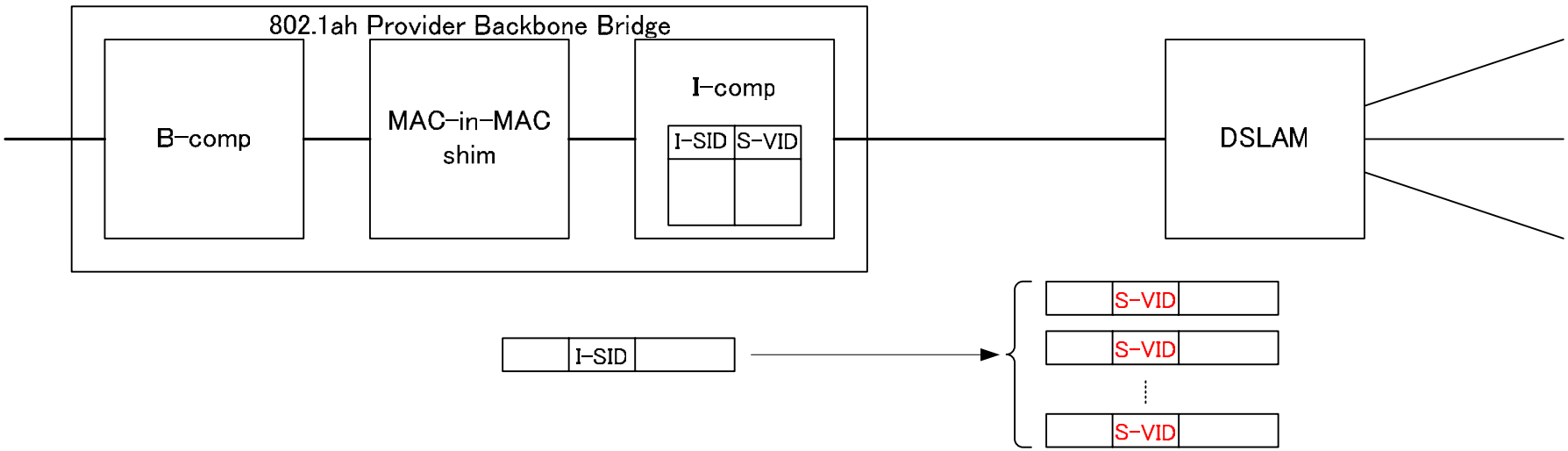


I-SID -> S-VID translation issue



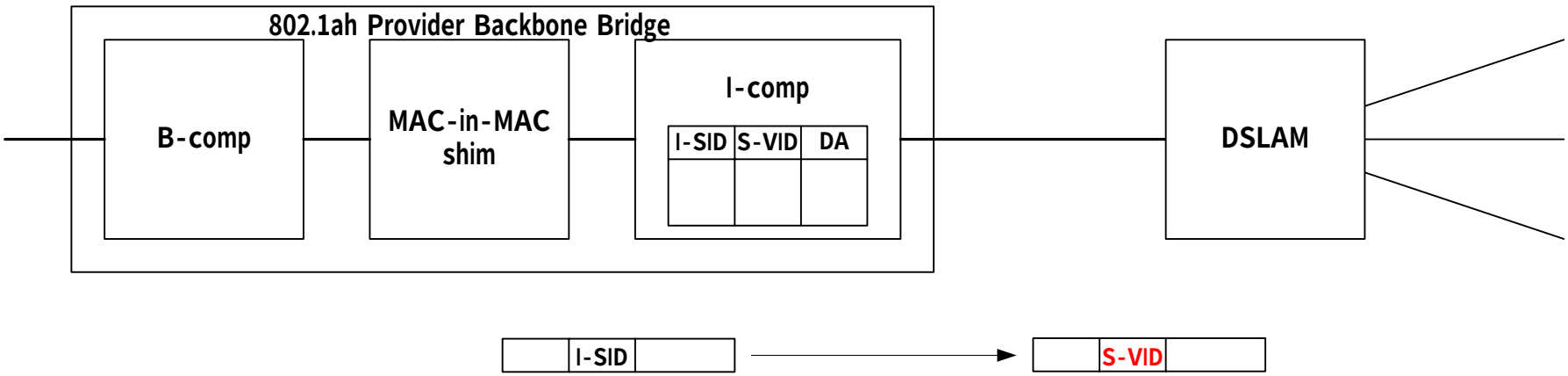
- Relationship between I-SID and S-VID is 1:N
  - S-VID identify a subscriber line for a customer
  - A customer may use multiple subscriber lines
  - Therefore, an I-SID may relate to multiple S-VIDs
- How to translate from I-SID to S-VID for egress frames?

Option 1: flooding



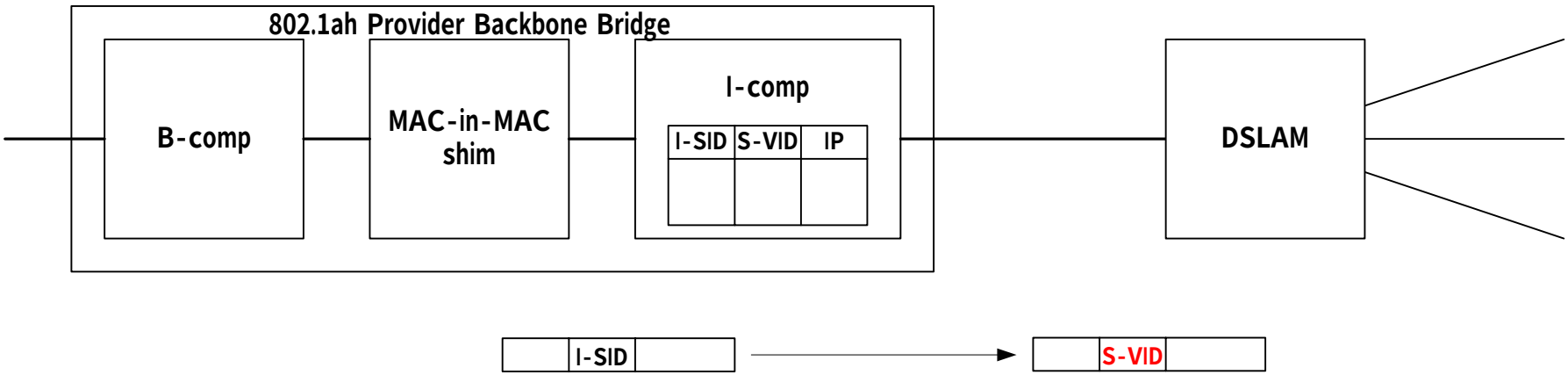
- I-comp translates from I-SID in I-tagged frame to all related S-VIDs, then generates S-tagged frames for all related S-VIDs
- It works, but inefficient……

Option 2: MAC address based translation



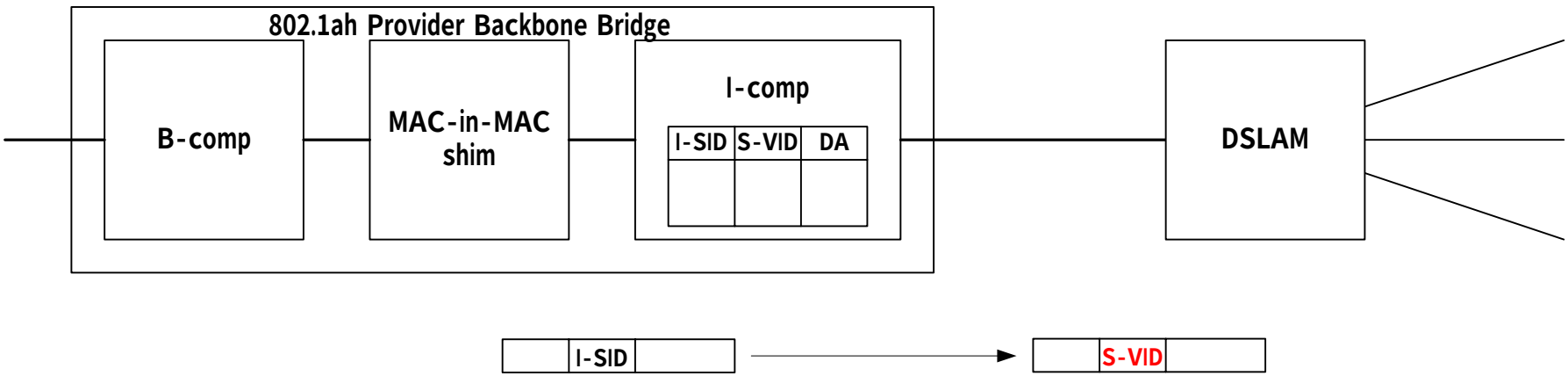
- I-comp has a {I-SID, MAC DA} <-> S-VID translation table
  - Entries are manually configured
- For egress frames, I-comp translates from {I-SID, MAC DA} in I-tagged frame to S-VID for S-tagged frame
- Manual configuration is much burden for customers and providers

Option 3: upper layer protocol based translation



- Upper layer protocol information could be used for S-VID translation
- Most of applications use IP, thus an end station has an IP address
- I-comp has a {I-SID, IP DA} <-> S-VID translation table
  - Entries are manually configured
- For egress frames, I-comp translates from {I-SID, IP DA} in I-tagged frame to S-VID for S-tagged frame
- Not much different from option 2

Option 4: learning



- I-comp has a {I-SID, MAC DA} <-> S-VID translation table
  - Relationship between I-SID and S-VID is manually configured
  - Relationship between S-VID and MAC DA is learned from ingress frames
- For egress frames, I-comp translates from {I-SID, MAC DA} in I-tagged frame to S-VID for S-tagged frame
- If MAC DA is not learned, egress frame is flooded as option 1
- May be good scheme, but learning may be expensive

Questions

- 802.1ah Provider Backbone Bridges should support 1:N I-SID/S-VID translation capability for DSLAM support
  - DSLAM is a real application for PBB
  - It may be optional functionality
- 4 options are proposed to enable DSLAM support
  - Flooding
  - MAC address based translation
  - Upper layer protocol based translation
  - Learning
- One option should be standardized or it is implementation choice?
- 802.1ag CFM correctly works in these environments?