# Information Elements for Data Link Layer Traffic Measurement
**(draft-kashima-ipfix-data-link-layer-monitoring-02.txt)**

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# Motivation

- **In a Wide-Area Ethernet network and a Data Center Bridged network, a variety of traffic monitoring is required.**
  - ❑ Traffic volume for each VLAN and QoS class (for traffic report to customer)
  - ❑ Multicast traffic volume (for capacity planning and loop detection)
- **IPFIX/PSAMP needs to meet this requirement.
  But IEs related to Ethernet header is not enough.**
  - ❑ IEs related to basic Ethernet
    - ● destinationMacAddress, sourceMacAddress, vlanId,
    - ● dot1qVlanId, dot1qCustomerVlanId,
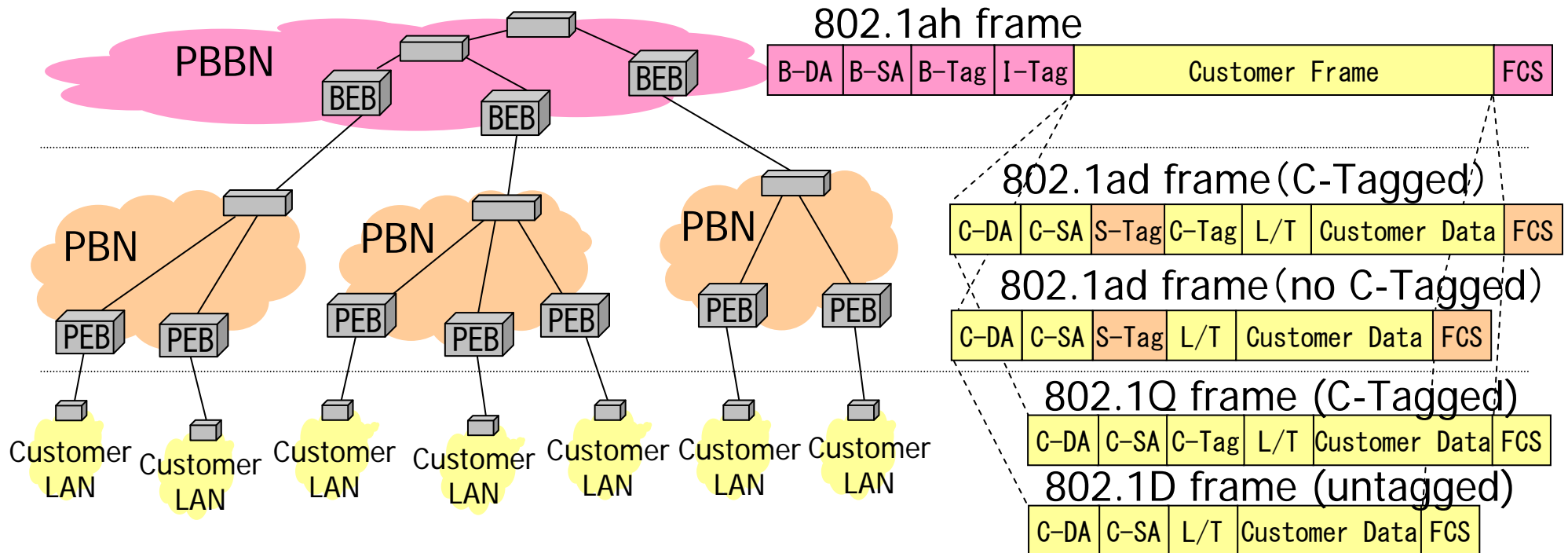    - ● dot1qPriority, dot1qCustomerPriority,
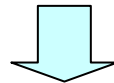
- **We require the relevant IEs for IPFIX/PSAMP to meet this requirement.**

# Wide-Area Ethernet

I talked about in Hiroshima.

- **Planning a network renovation from flat to hierarchical structure.**
  - Co-existing 802.1ad (Q-in-Q) and 802.1ah (MAC-in-MAC)
  - A lot of Ethernet components
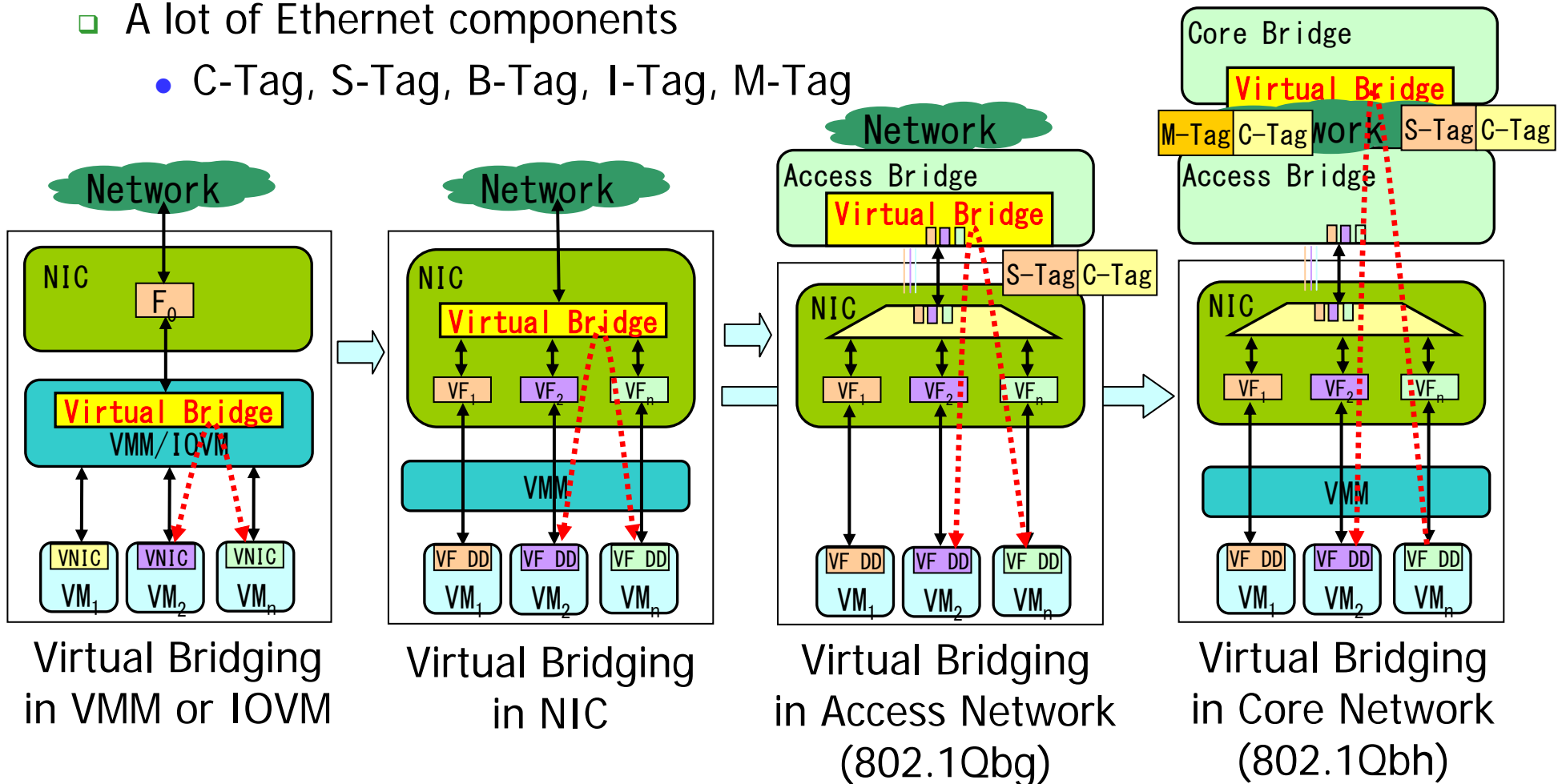    - MAC Address, VLAN-Tag (VLAN ID and QoS parameter bit), etc.

PBBN

BEB BEB BEB BEB

PBN PBN PBN

PEB PEB PEB PEB PEB PEB PEB

Customer LAN Customer LAN Customer LAN Customer LAN Customer LAN Customer LAN Customer LAN

**802.1ah frame**

| B-DA | B-SA | B-Tag | I-Tag | Customer Frame | FCS |

**802.1ad frame（C-Tagged）**

| C-DA | C-SA | S-Tag | C-Tag | L/T | Customer Data | FCS |

**802.1ad frame（no C-Tagged）**

| C-DA | C-SA | S-Tag | L/T | Customer Data | FCS |

**802.1Q frame (C-Tagged)**

| C-DA | C-SA | C-Tag | L/T | Customer Data | FCS |

**802.1D frame (untagged)**

| C-DA | C-SA | L/T | Customer Data | FCS |

# Data Center Bridging

New Application

- **Planning a virtual bridge renovation from server internal bridge to server external bridge.**
  - A lot of Ethernet components
    - C-Tag, S-Tag, B-Tag, I-Tag, M-Tag



Virtual Bridging
in VMM or IOVM

Virtual Bridging
in NIC

Virtual Bridging
in Access Network
(802.1Qbg)

Virtual Bridging
in Core Network
(802.1Qbh)

# Proposed IEs

- **A flexible traffic measurement is required in link layer.**
  - Just like ip*PacketSection for network layer.
- **Then we need three IEs.**

Red indicates difference from previous ver.

| Name | Description | Data Type | Id |
|---|---|---|---|
| dataLinkFrameType | The type of the selected link frame. **Reuse the value of managed object 'IANAifType' as defined in RFC2863** | **signed32** | TBD1 |
| dataLinkFrameSize | The size of the selected link frame. | unsigned**16** | TBD2 |
| dataLinkFrameSection | The first N octets of the selected link frame. A variable length. | octetArray | TBD3 |

# Discussion

- **Open issue:**
  - ❑ Several definitions for "dataLinkFrameType" are considered.
    - IANAifType: good enumeration, but indicates if type, not frame type.
    - Sub-type: needs IANA registration, and needs to discuss about complete list.
    - Reuse pcap frame type: good enumeration, but is not under the management of IANA.

- **Next step:**
  - ❑ Merge relevant IEs which Dharani/Laxmi/Yaonan and Paul propose.
  - ❑ And then, submit next version until IETF78.

- **Is this valuable as WG item?**