

# **Modification Comment for GATE Message**

**LEE Ho-Sook ETRI  
Yoo Tae-Whan ETRI  
Son Kyu-Ho KAIST  
Jeong Song KAIST**

# Motivation

- ❑ Yes, current GATE & REPORT message supports well DBA .
  - ✓ It supports 8 classes of priority queue of an ONU.
  - ✓ It can inform multiple grants for an ONU with one GATE transmission.
  - ✓ It can support unsolicited-grant (SBA) or request-grant (DBA) type bandwidth allocation scheme.
  
- ❑ But, It's not sufficient. We need additional field to support the more complicated and flexible DBA algorithm!!
  - ✓ DBA algorithm is not a scope of standard.
  - ✓ DBA algorithm can be developed and optimized to get the better performance in various way.
  - ✓ Vendor may want to operate other algorithms independently to improve DBA performance.

## Reason of the additional vendor specific field

- ❑ Current GATE & REPORT message is so simple and inflexible to support various DBA algorithms.
  - ✓ If OLT, not an ONU, wants to control bandwidth allocation for 8 classes of priority queue?
  - ✓ If OLT or ONU request an additional information for performance improvement of DBA? (such as Yoshihara's Sep. presentation and Miyoshi's Nov. presentation)
  - ✓ If OLT has its own bandwidth allocation policy and applies different service priority to support priority queue in ONU?

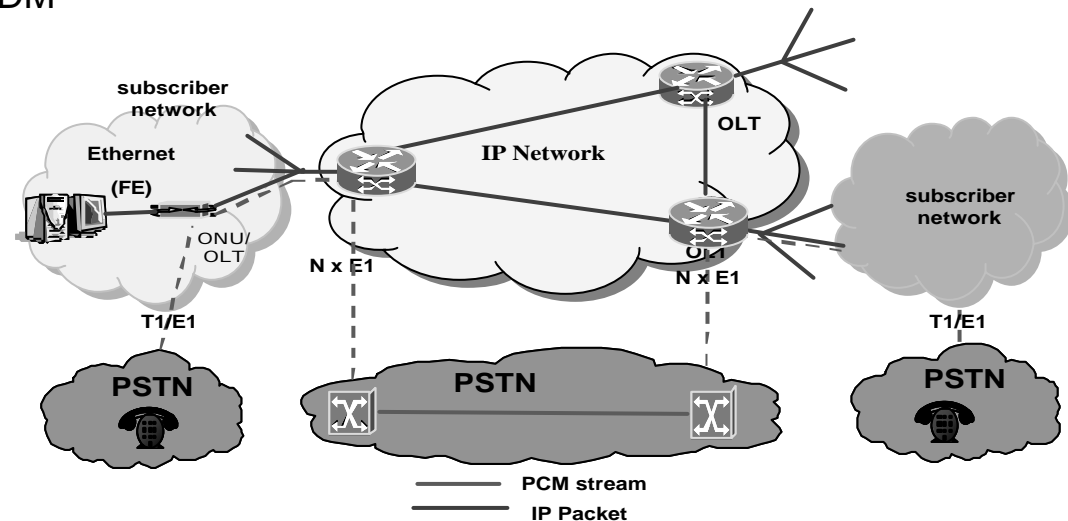
# Another reason (Special request of the network provider)

## ❑ Leased line service

- ✓ Network provider requests the leased line service in EPON scope.
- ✓ Provide the guaranteed fixed amount of bandwidth line to some subscriber.
  - target : SOHO located in relatively small building
  - 10-15 Mbps leased line service

## ❑ TDM over IP service

- ✓ Network provider request the circuit extension service in EPON scope.
- ✓ To maintain installed PBXs.
- ✓ Data & voice circuit extension
- ✓ IETF draft-vainshtein-cesopsn-02, Feb. 2002
  - CESoPSN (TDM Circuit Emulation Service over Packet Switched Network) for edge-to-edge emulation of TDM



# SBA & DBA hybrid

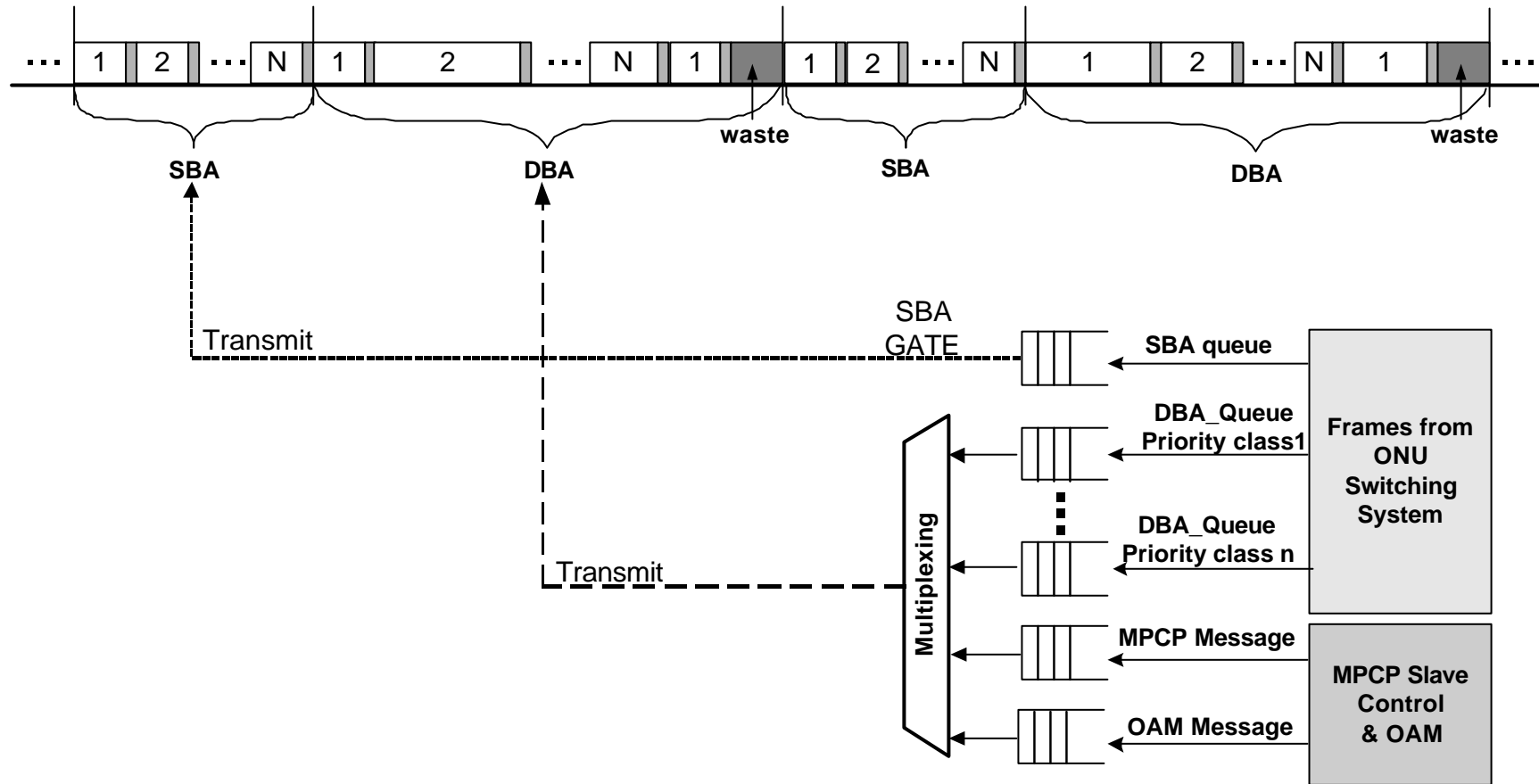
## ❑ SBA + DBA scheme

- ✓ DBA do not guarantee fixed amount of bandwidth.
- ✓ So, DBA only policy cannot satisfy special service such as leased line or TDMoIP.
- ✓ Solution
  - multiple bandwidth allocation policy in OLT
  - SBA for leased line or TDM service
  - DBA for Ethernet natural data service

## ❑ Operation principle

- ✓ Separate queuing system for each policy in ONU.
- ✓ One SBA queue + 8 classes of DBA queue
- ✓ Length of SBA region and grant length for an slot is provisioned.
- ✓ MPCP messages and OAM messages are converged with DBA data stream and transmitted in DBA period.

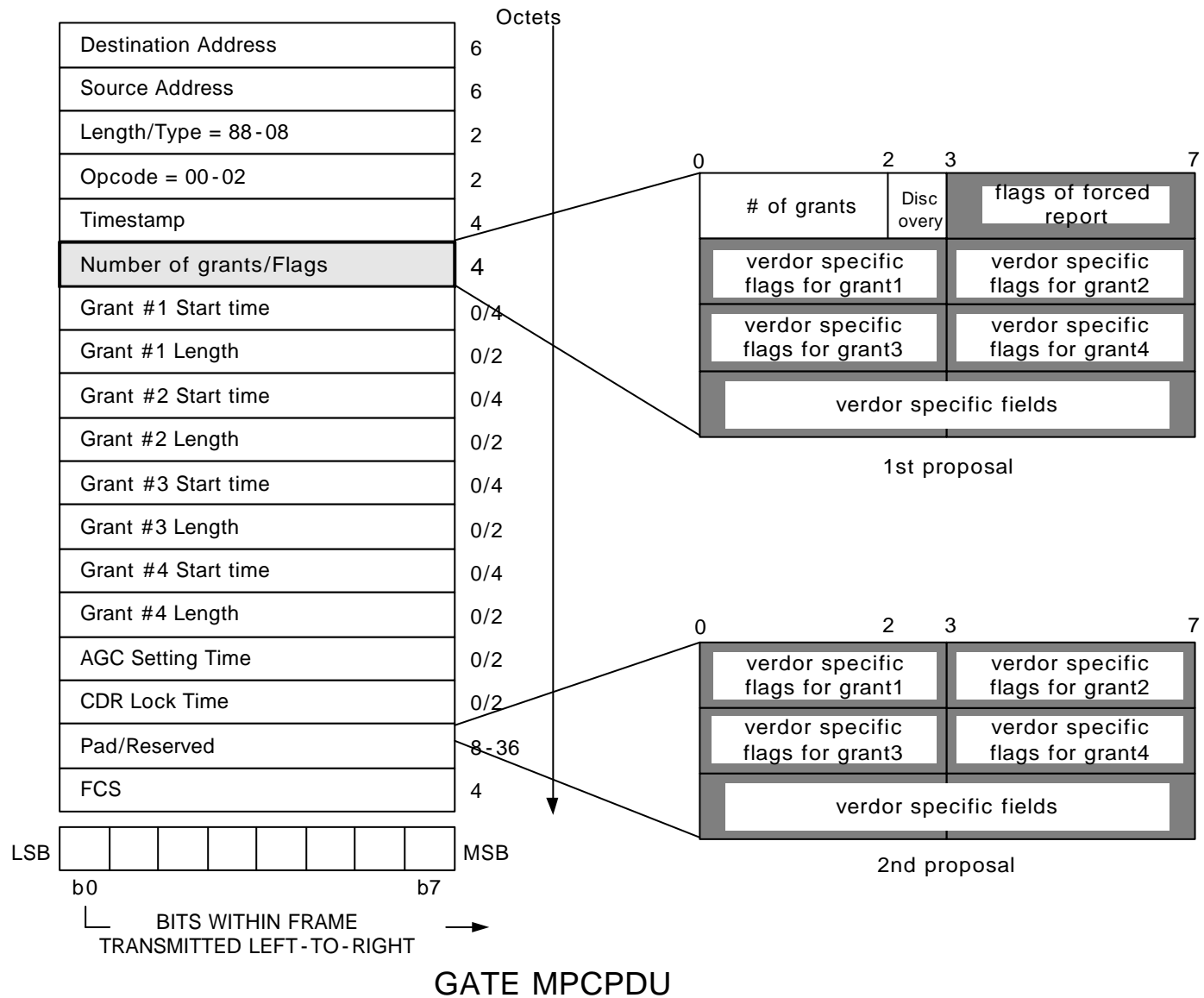
# Operation principle



## Current limitation

- ❑ How can we distinguish SBA GATE and DBA GATE?
  - ✓ We need the additional flags to represent bandwidth allocation policy for a grant.
  
- ❑ Is it enough?
  - ✓ More than 1 bit flags give us more flexibility for multiple policy.
  - ✓ For example, SBA1 + DBA1 + DBA2... policy
  - ✓ Additionally, inserting some bytes of vendor specific fields into “Pad/Reserved” field in GATE/REPORT message allows many other complicated DBA algorithm.
  
- ❑ Not touch the conventional field, but allow extension.
  - ✓ Preserve the conventional field → used for basic compliant
  - ✓ Extension of flag field & vendor specific field → used for advanced application

# Modification of GATE message





# Proposed modification of draft ver 1.2

## □ Clause 56 sub-clause 56.4.2 page 168 - 169

### ✓ Fig. 56-31

- 1<sup>st</sup> proposal : Change 1 byte “number of grants/flags” field to 4 bytes
  - 0-2 bit : # of grants
  - 3 bit : discovery gate / normal gate
  - 4-7 bit : flags for forced report
  - 2 bytes : 4bit flags for vendor specific extension (4bit flags \*4 grants info.)
  - 1 byte : vendor specific information
- 2<sup>nd</sup> proposal : Insert 3 bytes of “vendor specific fields” into “Pad/Reserved” field
  - 2 bytes : 4bit flags for vendor specific extension (4bit flags \*4 grants info.)
  - 1 byte : vendor specific information