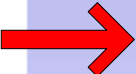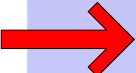# MPCP Message Format
(revisited)

Glen Kramer

Vendor fields are in our adopted baseline

MPCP General Description
(http://grouper.ieee.org/groups/802/3/efm/baseline/maislos_1_0312.pdf)

Scalability & Extensibility

- Fast granting cycles possible

- Dynamic granting capability allows fast bandwidth assignment

→ - Protocol has ability to add future fields

→ - Vendor-specific enhancements possible without compromising interoperability

- Split ratio and reach not limited by MPCP

6
802.3ah P2MP Track

Inconsistency in the Draft 1.2

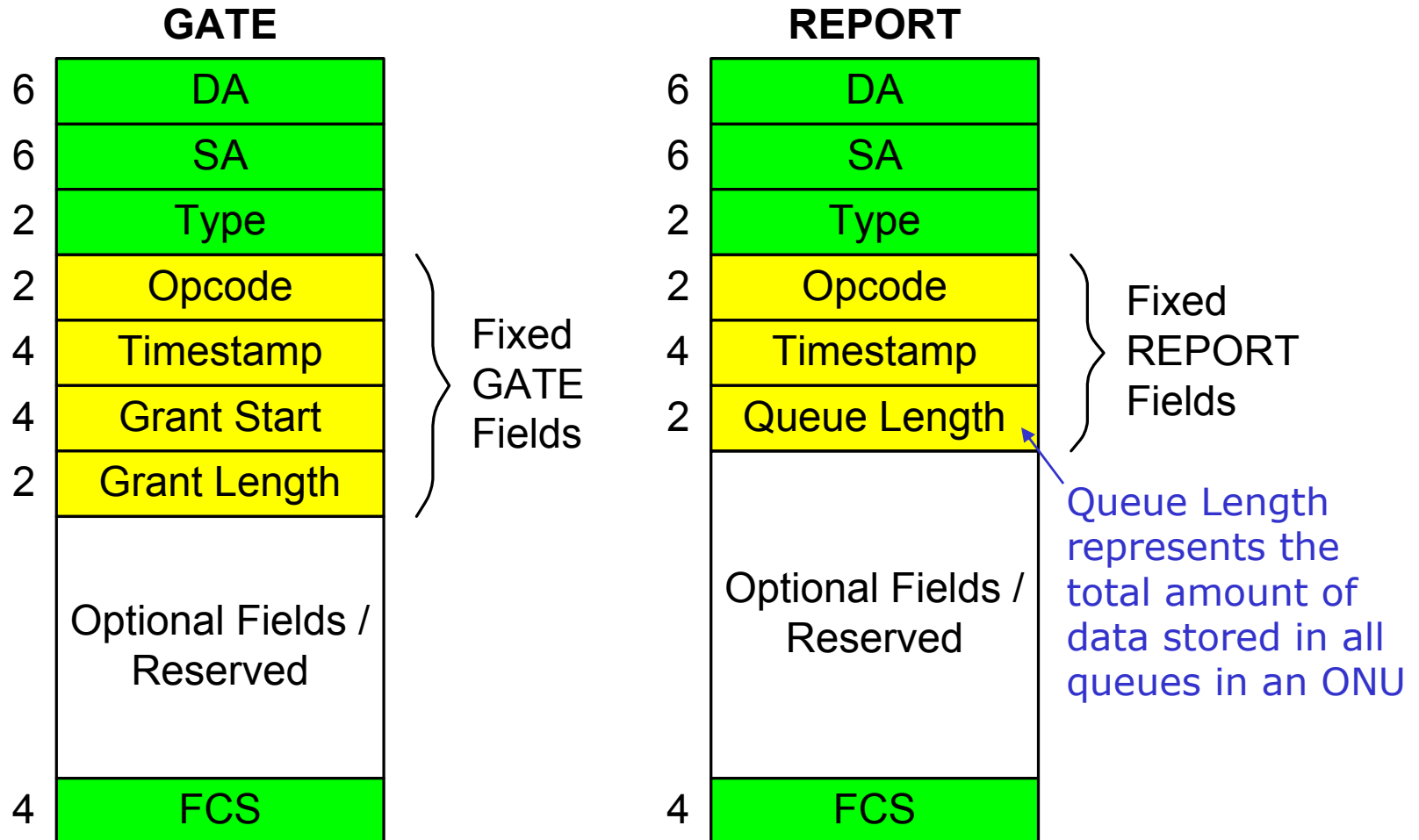- Bandwidth Allocation (ONU Scheduling) protocol is implementation-dependant

  - D1.2 page 122, line 53: [Clause 56] does not deal with topics including bandwidth allocation strategies…

  - Different Bandwidth Allocation strategies require different types of information to be passed between the OLT and ONUs

- MPCP Message format is fixed

  - That hinders the possibility of implementing different Bandwidth Allocation schemes

Solution

- Allow MPCP message to have fixed fields and optional fields

- Optional fields may be of two types: well-known fields and vendor-specific fields

  - Optional well-known fields will be described in a table in the standard

  - Optional vendor-specific fields are up to a vendor

Fixed Fields

- Fixed fields are very few and universal

GATE

6	DA
6	SA
2	Type
2	Opcode
4	Timestamp
4	Grant Start
2	Grant Length
	Optional Fields / Reserved
4	FCS

Fixed GATE Fields

REPORT

6	DA
6	SA
2	Type
2	Opcode
4	Timestamp
2	Queue Length
	Optional Fields / Reserved
4	FCS

Fixed REPORT Fields

Queue Length represents the total amount of data stored in all queues in an ONU

Optional Fields

- Field-codes are 1 octet long
  - **[0…127]** – Well-known field
  - **[128…255]** – Vendor-specific field
- Length and interpretation of well-known fields are known
- Interpretation of vendor-specific fields depends on vendor ID obtained through the OAM channel (Clause 55.6.3)

Optional Well-Known Fields

| 1 | Field-code |
| Known length | Value(s) |

Optional Vendor-Specific Fields

1	Field-code
1	Length
Length	Value(s)
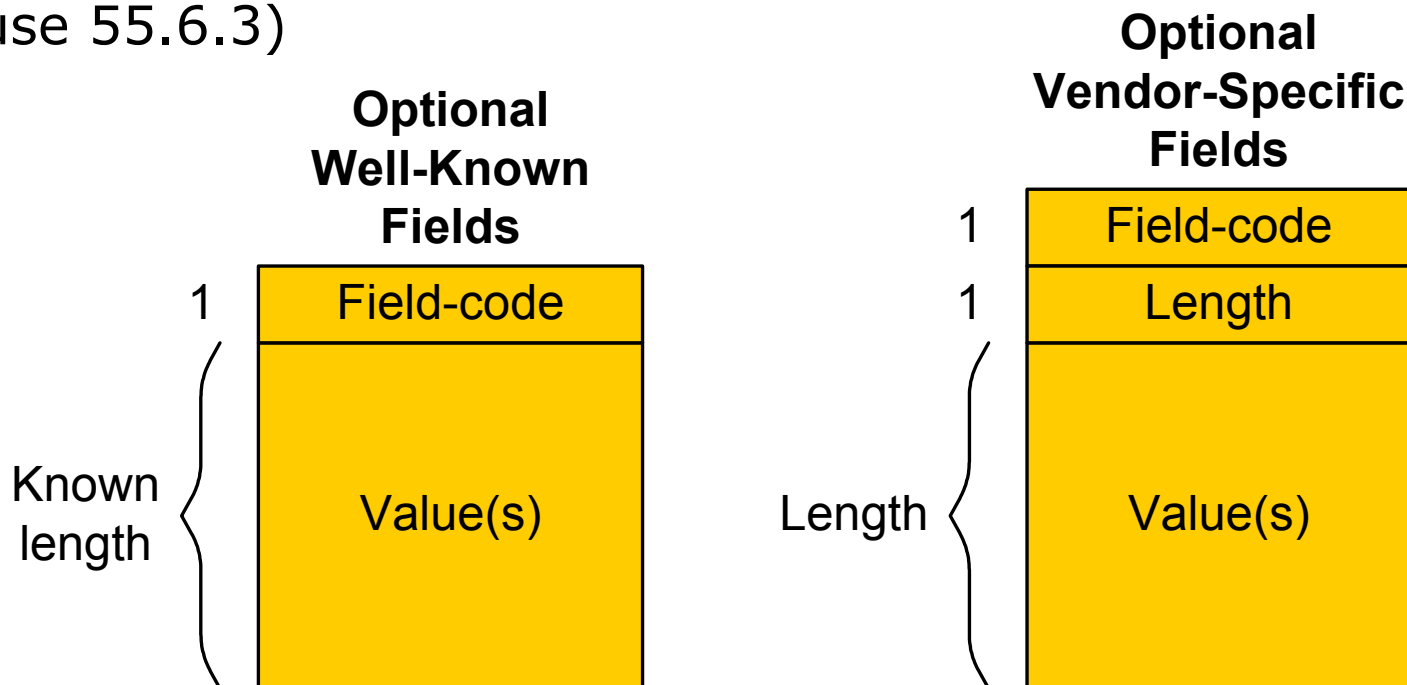
Examples of Well-Known fields (GATE)

1	Field Code = **01**
4	Grant Start Time
2	Grant Length

Additional Grant
Allows to pack multiple Grants in one GATE message

1	Field Code = **03**
1	Bitmap
2	Threshold Value

Set Threshold per Queue
Applies threshold values to the queues specified in the bitmap

1	Field Code = **02**
1	Bitmap
4	Grant Start Time
0/2	Length #0
0/2	Length #1
0/2	...
0/2	Length #7

Grant per Queue
Assigns grant length per queue specified in the bitmap

1	Field Code = **04**
1	Bitmap
2	Threshold Value

Reset Threshold per Queue
Revokes threshold values from the queues specified in the bitmap

Examples of Well-Known fields (REPORT)

1	Field Code = **10**
1	Bitmap
0/2	Length #0
0/2	Length #1
0/2	...
0/2	Length #7

Total Queue Length
Reports total queue lengths for the queues specified in the bitmap

1	Field Code = **11**
1	Bitmap
2	Threshold
0/2	Length #0
0/2	Length #1
0/2	...
0/2	Length #7

Queue Length under Threshold
Reports queue length under the threshold for the queues specified in the bitmap

1	Field Code = **12**
2	Busy Queues

Number of Busy Queues
Number of non-empty queues when REPORT was generated

Field Selection

- OLT and ONUs may support different optional fields
- Field selection is done via Capability Vector

OLT   ONU

DISCOVERY GATE

ONU reports all supported field-codes

OLT selects a subset of field-codes that it needs for its DBA algorithm

REGISTER_REQ (**list of supported Field-codes**)

REGISTER(**list of OLT's selected Field-codes**)

ONU acknowledges OLT's selection. All future REPORTs will contain only the selected fields

REGISTER_ACK (**confirm selected Field-codes**)