

## 14 Management entities

### 14.1 Introduction

### 14.2 Branch 0xDA “identification”

### 14.3 Branch 0x07 “basic attributes”

### 14.4 Branch 0xDB “extended attributes”

Table 14-55—Extended attributes defined in branch 0xDB

Leaf	Attribute	Defined in
Object group: Bridging		
...	...	...
0x01-20	aLlidType	14.4.2.16
0x01-21	aServicePortType	14.4.2.17
0x01-22	aQueueInfo	14.4.2.18
<u>0x01-23</u>	<u>aGlidType</u>	<u>14.4.2.19</u>
<u>0x01-24</u>	<u>aGlidMembership</u>	<u>14.4.2.20</u>
...	...	...

#### 14.4.1 ONU management

##### 14.4.1.1 Sequence TLV (0xDB/0x00-01)

##### 14.4.1.2 Attribute *aOnuld* (0xDB/0x00-02)

##### 14.4.1.3 Attribute *aOnuFwVersion* (0xDB/0x00-03)

##### 14.4.1.4 Attribute *aOnulInfoChipset* (0xDB/0x00-04)

##### 14.4.1.5 Attribute *aOnulInfoDateManufacture* (0xDB/0x00-05)

##### 14.4.1.6 Attribute *aOnulInfoManufacturer* (0xDB/0x00-06)

##### 14.4.1.7 Attribute *aOnuLlidCapability* (0xDB/0x00-07)

This attribute represents the number of LLIDs supported by the given ONU, including both the bidirectional and unidirectional LLIDs. This attribute consists of the following sub-attributes: *sBidirectional*, ~~*and*~~, *sUnidirectional*, *sGroups*, and *sGroupMaxSize*.

Sub-attribute *aOnuLlidCapability.sBidirectional*:

**Syntax:** Unsigned integer

**Remote access:** Read-Only

**Description:** This sub-attribute represents the number of bidirectional LLIDs (PLIDs, MLIDs, and ULIDs) supported by the given ONU. The value of this sub-attribute includes the primary PLID and primary MLID assigned during ONU registration.

Sub-attribute *aOnuLlidCapability.sUnidirectional*:

**Syntax:** Unsigned integer

**Remote access:** Read-Only

**Description:** This sub-attribute represents the number of unidirectional (multicast) LLIDs (PLIDs, MLIDs, and ULIDs) supported by the given ONU. The value of this sub-attribute includes the broadcast PLID (BCAST\_PLID) and broadcast MLID (BCAST\_MLID) that are pre-configured in each ONU (see IEEE Std 802.3ca, 144.3.5).

Sub-attribute *aOnuLlidCapability.sGroups*:

**Syntax:** Unsigned integer  
**Remote access:** Read-Only  
**Description:** This sub-attribute represents the number of group logical links (GLIDs) supported by the given ONU. If the ONU does not support GLIDs, this sub-attribute has the value of zero.

Sub-attribute *aOnuLlidCapability.sGroupMaxSize*:

**Syntax:** Unsigned integer  
**Remote access:** Read-Only  
**Description:** This sub-attribute represents the maximum number of LLIDs that can be members of any GLID. If the ONU does not support GLIDs, this sub-attribute has the value of zero.

The *aOnuLlidCapability* attribute is associated with the ONU object (see 14.2.1). The Variable Container TLV for the *aOnuLlidCapability* attribute shall be as specified in Table 14-2~~Table 14-62~~.

**Table 14-~~62~~—ONU LLID Capability TLV (0xDB/0x00-07)**

Size (octets)	Field (name)	Value	Notes
1	<i>Branch</i>	0xDB	Branch identifier
2	<i>Leaf</i>	0x00-07	Leaf identifier
1	<i>Length</i>	<del>0x04</del> 0x08	The size of TLV fields following the Length field
2	<i>Bidirectional</i>	Varies	Value of <i>sBidirectional</i> sub-attribute
2	<i>Unidirectional</i>	Varies	Value of <i>sUnidirectional</i> sub-attribute
<u>2</u>	<u><i>Groups</i></u>	<u>Varies</u>	<u>Value of <i>sGroup</i> sub-attribute</u>
<u>2</u>	<u><i>GroupMaxSize</i></u>	<u>Varies</u>	<u>Value of <i>sGroupMaxSize</i> sub-attribute</u>

## 14.4.2 Bridging

- 14.4.2.1 Attribute *aOnuDynMacTableSize* (0xDB/0x01-01)
- 14.4.2.2 Attribute *aOnuDynMacAgeLimit* (0xDB/0x01-02)
- 14.4.2.3 Attribute *aUniDynMacTable* (0xDB/0x01-03)
- 14.4.2.4 Attribute *aUniStatMacTable* (0xDB/0x01-04)
- 14.4.2.5 Attribute *aUniPortAutoNeg* (0xDB/0x01-05)
- 14.4.2.6 Attribute *aUniAdmissionControl* (0xDB/0x01-06)
- 14.4.2.7 Attribute *aUniMinLearnMacCount* (0xDB/0x01-07)
- 14.4.2.8 Attribute *aUniMaxLearnMacCount* (0xDB/0x01-08)
- 14.4.2.9 Attribute *aOnuMaxLearnMacCount* (0xDB/0x01-09)
- 14.4.2.10 Attribute *aUniLengthDiscard* (0xDB/0x01-0A)
- 14.4.2.11 Attribute *aUniFloodUnknown* (0xDB/0x01-0B)
- 14.4.2.12 Attribute *aUniLocalSwitching* (0xDB/0x01-0C)
- 14.4.2.13 Attribute *aUniMacTableFull* (0xDB/0x01-0F)
- 14.4.2.14 Attribute *aOnuMaxFrameSizeCapability* (0xDB/0x01-12)
- 14.4.2.15 Attribute *aUniMaxFrameSizeLimit* (0xDB/0x01-13)
- 14.4.2.16 Attribute *aLlidType* (0xDB/0x01-20)
- 14.4.2.17 Attribute *aServicePortType* (0xDB/0x01-21)
- 14.4.2.18 Attribute *aQueueInfo* (0xDB/0x01-22)

### **14.4.2.19 Attribute *aGlidType* (0xDB/0x01-23)**

This attribute represents the set of GLIDs provisioned in the given ONU using the *acConfigGlid* action (4.6.2.10). This attribute consists of the following sub-attributes: *sGlidCount*, *sGlidValue[sGlidCount]*, and *sGlidPolicy[sGlidCount]*.

Sub-attribute *aGlidType.sGlidCount*:

**Syntax:** Unsigned integer

**Remote access:** Read-Only

**Description:** This sub-attribute represents the number of GLIDs provisioned in the given ONU.

Sub-attribute *aGlidType.sGlidValue[sGlidCount]*:

**Syntax:** LLID value

**Range:** 0x00-00 to 0xFF-FF

**Remote access:** Read-Only

**Description:** This sub-attribute represents the values of the GLIDs that exist (were provisioned) in the given ONU. Valid LLID (GLID) values are defined in IEEE Std 802.3ca, 144.3.5.

Sub-attribute *aGlidType.sGlidPolicy[sGlidCount]*:

**Syntax:** Enumeration

**Remote access:** Read-Only

**Description:** This sub-attribute indicates the scheduling policy provisioned for each GLID in the given ONU. The following policies are valid:

*sch\_strict\_pri*: the scheduling policy is strict priority.

*sch\_weighted\_rr*: the scheduling policy is weighted round robin.

The Variable Container TLV for the *aGlidType* attribute shall be as specified in Table 14-3. The *aGlidType* attribute is associated with either the ONU object or the GLID object (see 14.2.1).

When the object is ONU, the Variable Container TLV for the *aGlidType* attribute contains information about all GLIDs provisioned in the given ONU. The order of GLIDs in the TLV is implementation-dependent.

When the object is GLID, the Variable Container TLV contains information about the single GLID represented by the supplied object context.

**Table 14-3—GLID Type TLV (0xDB/0x01-23)**

<b>Size (octets)</b>	<b>Field (name)</b>	<b>Value</b>	<b>Notes</b>
<u>1</u>	<i>Branch</i>	0xDB	Branch identifier
<u>2</u>	<i>Leaf</i>	0x01-23	Leaf identifier
<u>1</u>	<i>Length</i>	$2 + 3 \times N$	The size of TLV fields following the <i>Length</i> field. <i>N</i> represents the value of the <i>sGlidCount</i> sub-attribute.
<u>2</u>	<i>GlidCount</i>	Varies	Value of the <i>sGlidCount</i> sub-attribute. If the context object for this TLV is GLID, then the <i>GlidCount</i> is equal to 1.
<u>2</u>	<i>GlidValue[0]</i>	Varies	Value of <i>sGlidValue[0]</i> sub-attribute.
<u>1</u>	<i>GlidPolicy[0]</i>	Varies	Value of <i>sGlidPolicy[0]</i> sub-attribute, encoded as follows: <i>sch_strict_pri</i> : 0x01 <i>sch_weighted_rr</i> : 0x02
...	...	...	...
<u>2</u>	<i>GlidValue[N-1]</i>	Varies	Value of <i>sGlidValue[N-1]</i> sub-attribute. This field is only present if the supplied context object is the ONU.
<u>1</u>	<i>GlidPolicy[N-1]</i>	Varies	Value of <i>sGlidPolicy[N-1]</i> sub-attribute. (See <i>sGlidPolicy[0]</i> for encoding.) This field is only present if the supplied context object is the ONU.

#### 14.4.2.1914.4.2.20 Attribute *aGlidMembership* (0xDB/0x01-24)

This attribute represents the set of LLIDs provisioned to be members of the given GLID. The LLID's membership in various GLIDs is provisioned using the *acConfigGlidMember* action (14.6.2.11). This attribute consists of the following sub-attributes: *sMemberCount*, *sLlidValue[sMemberCount]*, and *sLlidParameter[sMemberCount]*.

Sub-attribute *aGlidMembership.sMemberCount*:

**Syntax:** Unsigned integer

**Remote access:** Read-Only

**Description:** This sub-attribute represents the number of LLIDs provisioned to be members of the given GLID.

Sub-attribute *aGlidMembership.sLlidValue[sMemberCount]*:

**Syntax:** LLID value

**Range:** 0x00-00 to 0xFF-FF

**Remote access:** Read-Only

**Description:** This sub-attribute represents the values of the LLIDs that were provisioned to be members of the given GLID. Valid LLID values are defined in IEEE Std 802.3ca, 144.3.5.

Sub-attribute *aGlidMembership.sLlidParameter[sMemberCount]*:

**Syntax:** Unsigned integer

**Range:** 0x00-00 to 0xFF-FF

**Remote access:** Read-Only

**Description:** This sub-attribute represents the value of the parameter assigned to each member LLID. The interpretation of the parameter value depends on the provisioned GLID policy, as specified in 14.6.2.1.

The Variable Container TLV for the *aGlidMembership* attribute shall be as specified in Table 14-3. The *aGlidMembership* attribute is associated with the GLID object (see 14.2.1).

**Table 14-4—GLID Membership TLV (0xDB/0x01-24)**

<u>Size (octets)</u>	<u>Field (name)</u>	<u>Value</u>	<u>Notes</u>
<u>1</u>	<i>Branch</i>	0xDB	<u>Branch identifier</u>
<u>2</u>	<i>Leaf</i>	0x01-24	<u>Leaf identifier</u>
<u>1</u>	<i>Length</i>	$2 + 3 \times N$	<u>The size of TLV fields following the <i>Length</i> field. <i>N</i> represents the value of the <i>sMemberCount</i> sub-attribute.</u>
<u>2</u>	<i>MemberCount</i>	Varies	<u>Value of the <i>sMemberCount</i> sub-attribute.</u>
<u>2</u>	<i>LlidValue[0]</i>	Varies	<u>Value of <i>sLlidValue[0]</i> sub-attribute.</u>
<u>1</u>	<i>LlidParameter[0]</i>	Varies	<u>Value of <i>sLlidParameter[0]</i> sub-attribute</u>
...	...	...	...
<u>2</u>	<i>LlidValue[N-1]</i>	Varies	<u>Value of <i>sLlidValue[N-1]</i> sub-attribute.</u>
<u>1</u>	<i>LlidParameter[N-1]</i>	Varies	<u>Value of <i>sLlidParameter[N-1]</i> sub-attribute.</u>

## 14.5 Branch 0x09 “basic actions”

## 14.6 Branch 0xDD “extended actions”

This subclause specifies a set of extended management actions used by the OLT to enforce a specific behavior in the ONU. The extended management actions shown in Table 14-200 shall be supported by this profile.

**Table 14-200—Extended actions defined in branch 0xDD**

<b>Leaf</b>	<b>Attribute</b>	<b>Defined in</b>
Object group: ONU management		
0x00-01	acOnuReboot	14.4.5.1.1
Object group: Bridging		
0x01-01	acMacClearDynamicTable	14.4.5.2.1
0x01-02	acMacAddDynamicAddress	14.4.5.2.2

Leaf	Attribute	Defined in
0x01-03	acMacDeleteDynamicAddress	14.4.5.2.3
0x01-04	acMacClearStaticTable	14.4.5.2.4
0x01-05	acMacAddStaticAddress	14.4.5.2.5
0x01-06	acMacDeleteStaticAddress	14.4.5.2.6
0x01-08	acGetUniMacLearned	14.4.5.2.7
0x01-20	acConfigLlid	14.4.5.2.8
0x01-21	acConfigServicePort	14.4.5.2.9
<u>0x01-23</u>	<u>acConfigGlid</u>	<u>14.4.5.2.10</u>
<u>0x01-24</u>	<u>acConfigGlidMember</u>	<u>14.4.5.2.11</u>
...	...	...

All other Leaf values are reserved and ignored on reception.

### 14.6.1 ONU management

#### 14.6.2 Bridging

##### 14.6.2.1 Action *acMacClearDynamicTable* (0xDD/0x01-01)

##### 14.6.2.2 Action *acMacAddDynamicAddress* (0xDD/0x01-02)

##### 14.6.2.3 Action *acMacDeleteDynamicAddress* (0xDD/0x01-03)

##### 14.6.2.4 Action *acMacClearStaticTable* (0xDD/0x01-04)

##### 14.6.2.5 Action *acMacAddStaticAddress* (0xDD/0x01-05)

##### 14.6.2.6 Action *acMacDeleteStaticAddress* (0xDD/0x01-06)

##### 14.6.2.7 Attribute *acGetUniMacLearned* (0xDD/0x01-08)

##### 14.6.2.8 Action *acConfigLlid* (0xDD/0x01-20)

##### 14.6.2.9 Action *acConfigServicePort* (0xDD/0x01-21)

##### 14.6.2.10 Action *acConfigGlid* (0xDD/0x01-23)

This action is used by the NMS to either (a) add a new GLID entity to the given ONU or (b) delete one GLID entity, or (c) delete all GLID entities that were previously added to the given ONU. Multiple GLIDs may be provisioned in the ONU. This action consists of the following sub-attributes: *sGlidAction*, *sGlidValue*, and *sGlidPolicy*.

Sub-attribute *acConfigGlid.sGlidAction*:

**Syntax:** Enumeration

**Remote access:** Write-Only

**Description:** This sub-attribute specifies the action, as follows:

add\_glid: a single GLID entity identified by the *sGlidValue* sub-attribute is added.

del\_glid: a single GLID entity identified by the *sGlidValue* sub-attribute is deleted.

del\_all: all previously-added GLID entities are deleted.

Sub-attribute *acConfigGlid.sGlidValue*:

<b>Syntax:</b>	LLID value
<b>Range:</b>	0x10-00 to 0xFF-FF
<b>Remote access:</b>	Write-Only
<b>Description:</b>	This sub-attribute indicates the value of the GLID that is to be added or deleted by this action. Valid LLID (GLID) values are defined in IEEE Std 802.3ca, 144.3.5.

Sub-attribute *acConfigGlid.sGlidPolicy*:

<b>Syntax:</b>	Enumeration
<b>Remote access:</b>	Write-Only
<b>Description:</b>	This sub-attribute specifies the GLID scheduling policy. The following policies are valid: <u>sch_strict_pri</u> : the scheduling policy is strict priority. <u>sch_weighted_rr</u> : the scheduling policy is weighted round robin.

The action of deleting a GLID entity neither deletes the LLIDs that are members of this GLID, nor it affects any data stored in the LLID's queues.

The ONU shall respond with the "Insufficient Resources" code 0x87 (see 13.4.7) to a request to add a new GLID entity (*sGlidAction* = add\_glid) if the maximum supported number of GLID entities has already been created.

The ONU shall respond with the "Bad Parameters" code 0x86 (see 13.4.7) to a request to add or delete a GLID entity if any of the following conditions are present:

- add\_glid request containing an GLID value that already exists in this ONU;
- del\_glid request containing an GLID value that does not exist in this ONU.

The *acConfigGlid* action is associated with the ONU object (see 14.4.1.1). The Variable Container TLV for the *acConfigGlid* action shall be as specified in Table 14-212.

**Table 14-212—Config Group Link TLV (0xDD/0x01-23)**

<u>Size (octets)</u>	<u>Field name</u>	<u>Value</u>	<u>Notes</u>
<u>1</u>	<u>Branch</u>	<u>0xDD</u>	<u>Branch identifier</u>
<u>2</u>	<u>Leaf</u>	<u>0x01-23</u>	<u>Leaf identifier</u>
<u>1</u>	<u>Length</u>	<u>4</u>	<u>The size of TLV fields following the Length field.</u>
<u>1</u>	<u>GlidAction</u>	<u>Varies</u>	<u>Value of sGlidAction sub-attribute, encoded as follows:</u> <u>add_glid: 0xA1</u> <u>del_glid: 0xD1</u> <u>del_all: 0xDA</u>
<u>2</u>	<u>GlidValue</u>	<u>Varies</u>	<u>Value of sGlidValue sub-attribute. This field is only present when the GlidAction field is equal to add_glid or del_glid.</u>
<u>1</u>	<u>GlidPolicy</u>	<u>Varies</u>	<u>Value of sGlidPolicy sub-attribute, encoded as follows:</u> <u>sch_strict_pri: 0xB0</u> <u>sch_weighted_rr: 0xD0</u> <u>This field is only present when the GlidAction field is equal to add_glid.</u>

#### 14.6.2.1014.6.2.11 Action *acConfigGlidMember* (0xDD/0x01-24)

This action is used by the NMS to either (a) add a new member LLID entity to the given GLID or (b) delete one member LLID entity, or (c) delete all member LLID entities that were previously added to the given GLID. This action consists of the following sub-attributes: *sMemberAction*, *sLlidValue*, and *sLlidParameter*.

Sub-attribute *acConfigGlidMember.sMemberAction*:

<b>Syntax:</b>	Enumeration
<b>Remote access:</b>	Write-Only
<b>Description:</b>	This sub-attribute determines the action, as follows: <i>add_member</i> : a single member LLID entity identified by the <i>sMemberLlidValue</i> sub-attribute is added. <i>del_member</i> : a single member LLID entity identified by the <i>sMemberLlidValue</i> sub-attribute is deleted. <i>del_all</i> : all previously-added member LLID entities are deleted.

Sub-attribute *acConfigGlidMember.sLlidValue*:

<b>Syntax:</b>	LLID value
<b>Range:</b>	0x10-00 to 0xFF-FF
<b>Remote access:</b>	Write-Only
<b>Description:</b>	This sub-attribute indicates the value of the LLID that is to be added or deleted by this action. Valid LLID values are defined in IEEE Std 802.3ca, 144.3.5.

Sub-attribute *acConfigGlidMember.sLlidParameter*:

<b>Syntax:</b>	Unsigned integer
<b>Range:</b>	0x00-00 to 0xFF-FF
<b>Remote access:</b>	Write-Only
<b>Description:</b>	This sub-attribute represents the value of the parameter associated with the member LLID. The interpretation of the parameter value depends on the provisioned scheduling policy of the GLID entity specified as the context of this attribute: <i>if acConfigGlid.sGlidPolicy = sch_strict_pri</i> then the <i>sLlidParameter</i> sub-attribute represents the priority of the given LLID member. The value of 0x00-00 represents the highest priority and 0xFF-FF represents the lowest priority; <i>if acConfigGlid.sGlidPolicy = sch_weighted_rr</i> then the <i>sLlidParameter</i> sub-attribute represents the non-normalized weight of the given LLID member. The normalized weight is obtained by dividing the value of <i>sLlidParameter</i> sub-attribute by the sum of weights of all members of this GLID.

The ONU shall respond with the “Insufficient Resources” code 0x87 (see 13.4.7) to a request to add a new member LLID entity (*sMemberAction* = *add\_member*) if the maximum supported number of member LLID entities has already been added to this GLID.

The ONU shall respond with the “Bad Parameters” code 0x86 (see 13.4.7) to a request to add or delete a member LLID entity if any of the following conditions are present:

- *add\_member* request containing an LLID value that has not been provisioned in the ONU;
- *add\_member* request containing an LLID value that is not of type bidirectional PLID, bidirectional MLID, or bidirectional ULID (see 13.4.2.16);
- *add\_member* request containing an LLID value that already is the member of this GLID;
- *del\_member* request containing an LLID value that is not a member of this GLID.



The *acConfigGlidMember* action is associated with the GLID object (see 14.4.1.1). The Variable Container TLV for the *acConfigGlidMember* action shall be as specified in [Table 14-213](#).

**Table 14-213—Config GLID Member TLV (0xDD/0x01-24)**

<u>Size (octets)</u>	<u>Field name</u>	<u>Value</u>	<u>Notes</u>
<u>1</u>	<u>Branch</u>	<u>0xDD</u>	<u>Branch identifier</u>
<u>2</u>	<u>Leaf</u>	<u>0x01-24</u>	<u>Leaf identifier</u>
<u>1</u>	<u>Length</u>	<u>Varies</u>	<u>The size of TLV fields following the <i>Length</i> field. This field takes the following values:</u> <u>1 if <i>MemberAction</i> = del_all;</u> <u>3 if <i>MemberAction</i> = del_member;</u> <u>5 if <i>MemberAction</i> = add_member.</u>
<u>1</u>	<u>MemberAction</u>	<u>Varies</u>	<u>Value of <i>sMemberAction</i> sub-attribute, encoded as follows:</u> <u>add_member: 0xA1</u> <u>del_member: 0xD1</u> <u>del_all: 0xDA</u>
<u>2</u>	<u>LlidValue</u>	<u>Varies</u>	<u>Value of <i>sLlidValue</i> sub-attribute. This field is only present when the <i>LlidAction</i> field is equal to <u>add_llid</u> or <u>del_llid</u>.</u>
<u>2</u>	<u>LlidParameter</u>	<u>Varies</u>	<u>Value of <i>sLlidParameter</i> sub-attribute. This field is only present when the <i>LlidAction</i> field is equal to <u>add_llid</u>.</u>