

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*, *sGroupMaxSize*, and *sGroupPolicy*.

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.sGlidMaxSize*:

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.

Sub-attribute *aOnuLlidCapability.sGlidPolicy*:

Syntax: Bitmap
Remote access: Read-Only
Description: This sub-attribute indicates which scheduling policies are supported by the ONU. The bit value of 1 indicates that the corresponding policy is supported and the value of 0 indicates that the policy is not supported. The bits are assigned as follows:
 Bit 0: non-strict priority scheduling policy as described in 8.5.4.1.
 Bit 1: strict priority scheduling policy as described in 8.5.4.2.
 Bit 2: EQ-based proportional (weighted) sharing policy as described in 8.5.4.3.
 Bit 3: frame-based proportional (weighted) sharing policy as described in 8.5.4.4.
 Bit 7: any scheduling policy, other than the policies specified in 8.5.4.1 through 8.5.4.4.

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-~~262~~—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>	0x04 <u>Varies</u>	The size of TLV fields following the <i>Length</i> field: <u>0x09 if <i>Groups</i> field has value greater than 0</u> <u>0x06 if <i>Groups</i> field has value of 0</u>
2	<i>Bidirectional</i>	<u>Varies</u>	Value of <i>sBidirectional</i> sub-attribute
2	<i>Unidirectional</i>	<u>Varies</u>	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>GlidMaxSize</i></u>	<u>Varies</u>	<u>Value of <i>sGlidMaxSize</i> sub-attribute. This field is not present if the <i>Groups</i> field has value of zero.</u>
<u>1</u>	<u><i>GlidPolicy</i></u>	<u>Varies</u>	<u>Value of <i>sGlidPolicy</i> sub-attribute. This field is not present if the <i>Groups</i> field has value of zero.</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 allowed values are the same as defined for the *sGlidPolicy* sub-attribute of the *acConfigGlid* action (see 14.6.2.10).

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)

Size (octets)	Field (name)	Value	Notes
<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 shown for the <i>GlidPolicy</i> field in Table 14-212.
...
<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, encoded as shown for the <i>GlidPolicy</i> field in Table 14-212. 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	Branch identifier
<u>2</u>	<i>Leaf</i>	0x01-24	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>sMemberCount</i> sub-attribute.
<u>2</u>	<i>MemberCount</i>	Varies	Value of the <i>sMemberCount</i> sub-attribute.
<u>2</u>	<i>LlidValue[0]</i>	Varies	Value of <i>sLlidValue[0]</i> sub-attribute.
<u>1</u>	<i>LlidParameter[0]</i>	Varies	Value of <i>sLlidParameter[0]</i> sub-attribute
...
<u>2</u>	<i>LlidValue[N-1]</i>	Varies	Value of <i>sLlidValue[N-1]</i> sub-attribute.
<u>1</u>	<i>LlidParameter[N-1]</i>	Varies	Value of <i>sLlidParameter[N-1]</i> sub-attribute.

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

Leaf	Attribute	Defined in
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
0x01-03	acMacDeleteDynamicAddress	14.4.5.2.3

Leaf	Attribute	Defined in
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*:

Syntax: LLID value

Range:	0x10-00 to 0xFF-FF
Remote access:	Write-Only
Description:	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*:

Syntax:	Enumeration
Remote access:	Write-Only
Description:	This sub-attribute specifies the GLID scheduling policy. The following values are valid:

- sch_priority*: the GLID scheduling policy is the non-strict priority, as described in 8.5.4.1
- sch_strict*: the GLID scheduling policy is the strict priority, as described in 8.5.4.2
- sch_eq_weighted*: the GLID scheduling policy is the EQ-based proportional (weighted) sharing, as described in 8.5.4.3
- sch_frm_weighted*: the GLID scheduling policy is the frame-based proportional (weighted) sharing, as described in 8.5.4.4
- sch_unspecified*: a vendor-specific GLID scheduling policy that is different from any of the policies specified in 8.5.4.1 through 8.5.4.4

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>Size (octets)</u>	<u>Field name</u>	<u>Value</u>	<u>Notes</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_priority: 0x01</u> <u>sch_strict: 0x02</u> <u>sch_eq_weighted: 0x04</u> <u>sch_frm_weighted: 0x08</u> <u>sch_unspecified: 0x80</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:

Syntax: Enumeration

Remote access: Write-Only

Description: This sub-attribute determines the action, as follows:

add_member: a single member LLID entity identified by the sMemberLlidValue sub-attribute is added.

del_member: a single member LLID entity identified by the sMemberLlidValue sub-attribute is deleted.

del_all: all previously-added member LLID entities are deleted.

Sub-attribute acConfigGlidMember.sLlidValue:

Syntax: LLID value

Range: 0x10-00 to 0xFF-FF

Remote access: Write-Only

Description: 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:

Syntax: Unsigned integer

Range: 0x00-00 to 0xFF-FF

Remote access: Write-Only

Description: 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:

if acConfigGlid.sGlidPolicy = sch_strict_pri then the sLlidParameter 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;

if *acConfigGlid.sGlidPolicy = sch_weighted_rr* then the *sLlidParameter* sub-attribute represents the non-normalized weight of the given LLID member. The normalized weight is obtained by dividing the value of *sLlidParameter* 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 14.4.2.16);
- *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 = del_all</i>;</u> <u>3 if <i>MemberAction = del_member</i>;</u> <u>5 if <i>MemberAction = add_member</i>.</u>
<u>1</u>	<u>MemberAction</u>	<u>Varies</u>	<u>Value of <i>sMemberAction</i> sub-attribute, encoded as follows:</u> <u><i>add_member</i>: 0xA1</u> <u><i>del_member</i>: 0xD1</u> <u><i>del_all</i>: 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 <i>add_llid</i> or <i>del_llid</i>.</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 <i>add_llid</i>.</u>