30. Management

30.2.3 Containment

A containment relationship is a structuring relationship for managed objects in which the existence of a managed object is dependent on the existence of a containing managed object. The contained managed object is said to be the subordinate managed object, and the containing managed object the superior managed object. The containment relationship is used for naming managed objects. The local containment relationships among object classes are depicted in the entity relationship diagrams, Figure 30–3 through Figure 30–5. These figures show the names of the object classes and whether a particular containment relationship is one-to-one, one-to-many or many-to-one. For further requirements on this topic, see IEEE Std 802.1F-1993. PSE management is only valid in a system that provides management at the next higher containment level, that is, either a DTE, repeater or Midspan with management.

MAU management is only valid in a system that provides management at the next higher containment level, that is, either a DTE or repeater with management

Replace Figure 30-3 with the following:

Replace Figure 30-4 with the following

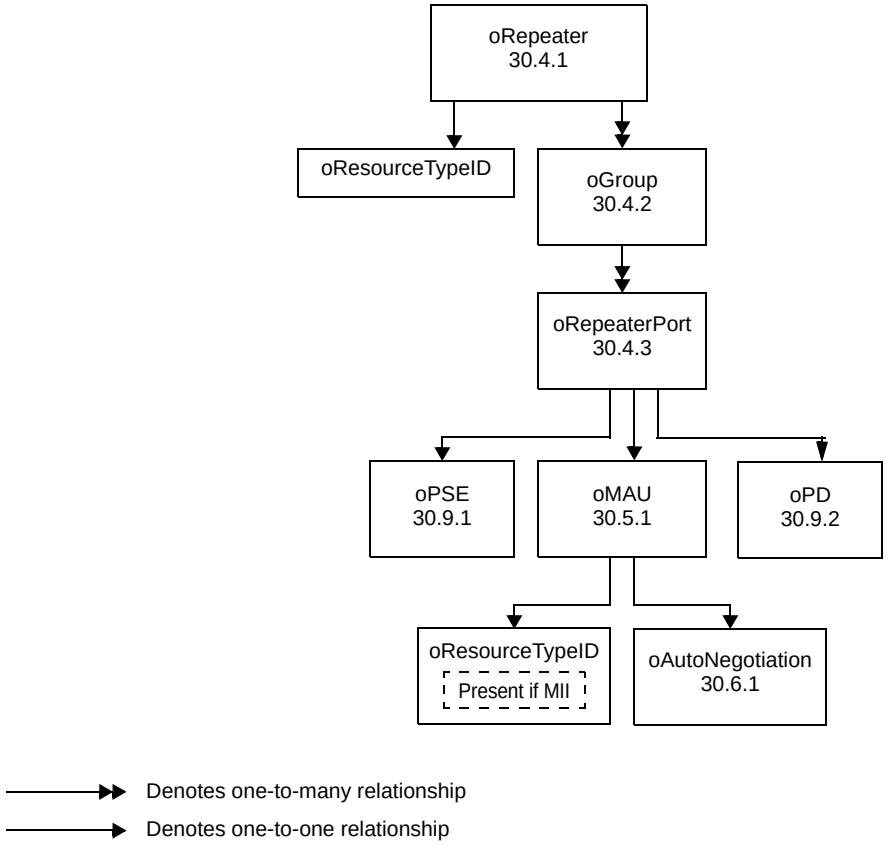
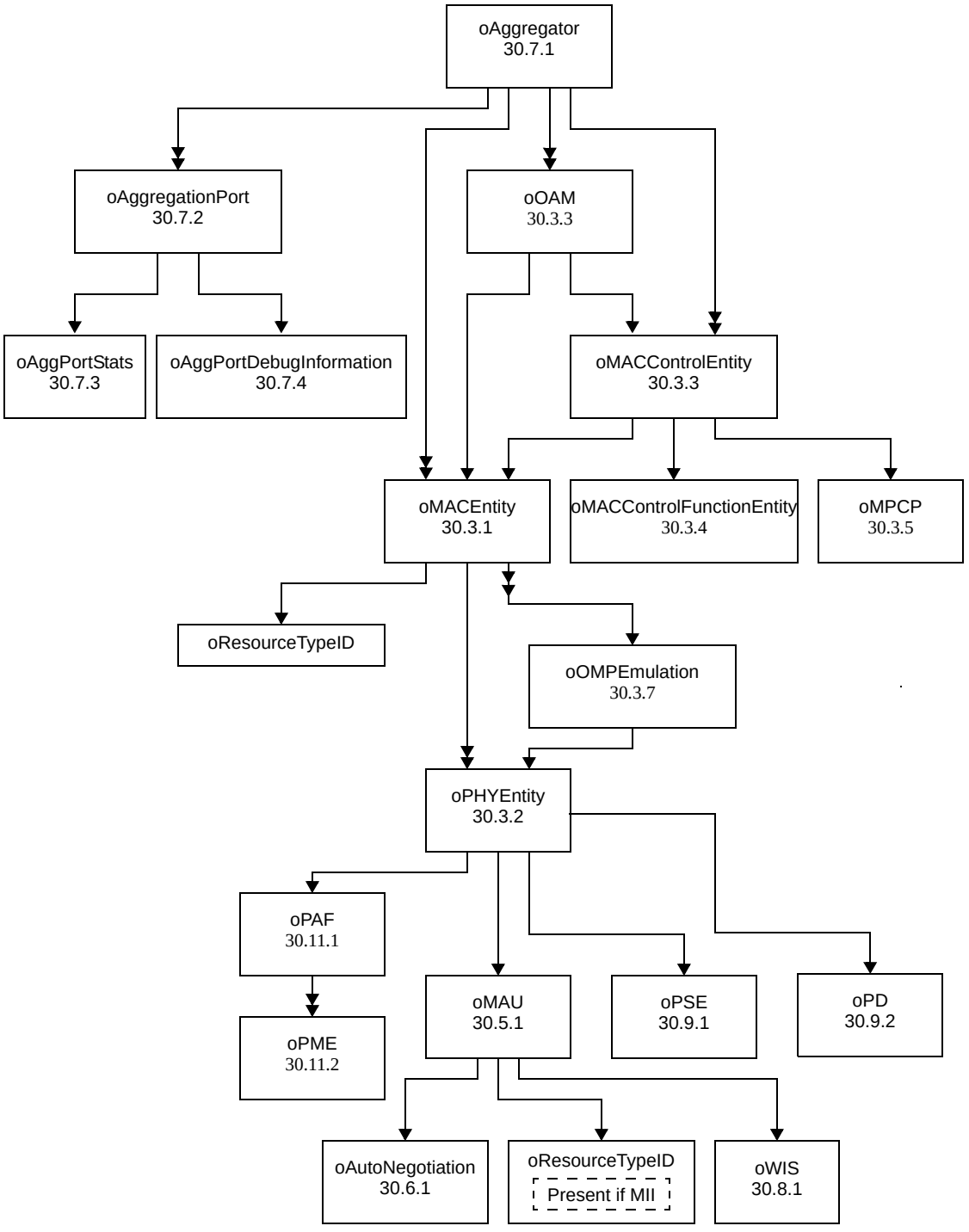


Figure 30–4—Repeater entity relationship diagram



Note—The objects oAggregator, oAggregationPort, oAggPortStats and oAggPortDebugInformation are deprecated by IEEE Std 802.1AX-200X.

Figure 30–3— DTE System entity relationship diagram

30.2.4 Naming

The name of an individual managed object is hierarchically defined within a managed system. For example, in the context of repeater management, a repeater port might be identified as “repeater 3, group 01, port 13,” that is, port 13 of group 01 of a repeater with repeaterID 3 within the managed system.

In the case of MAU management, this will present itself in one of the two forms that are appropriate for a MAU’s use, that is, as associated with a CSMA/CD interface of a DTE or with a particular port of a managed repeater. For example, a MAU could be identified as “repeater 3, group 01, port 13, MAU 1” or, that is, the MAU associated with port 13 of group 01 of a repeater with repeaterID 3 within the managed system. Examples of this are represented in the relationship of the naming attributes in the entity relationship diagram, Figure 30–3.

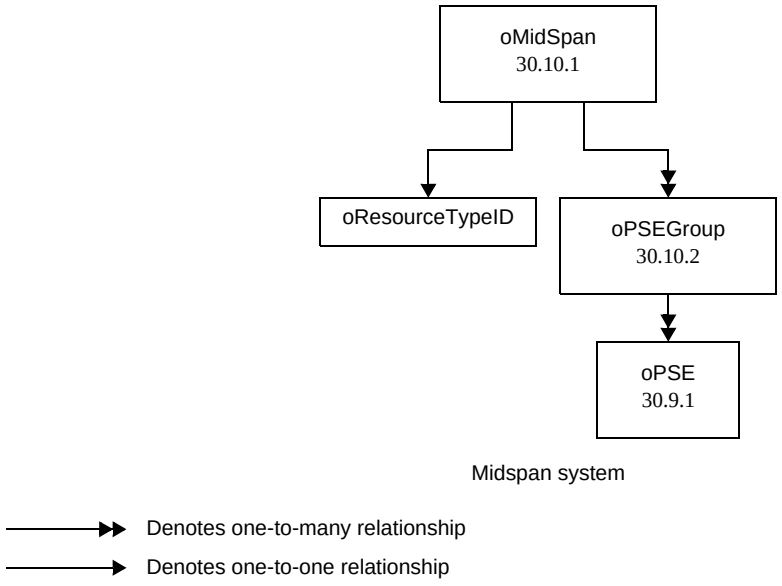


Figure 30–5—Midspan entity relationship diagram

30.2.5 Capabilities

This standard makes use of the concept of *packages* as defined in ISO/IEC 10165-4:1992 as a means of grouping behaviour, attributes, actions, and notifications within a managed object class definition. Packages may either be mandatory, or be conditional, that is to say, present if a given condition is true. Within this standard *capabilities* are defined, each of which corresponds to a set of packages, which are components of a number of managed object class definitions and which share the same condition for presence. Implementation of the appropriate Basic and Mandatory packages is the minimum requirement for claiming conformance to IEEE 802.3 Management. Implementation of an entire optional capability is required in order to claim conformance to that capability. The capabilities and packages for IEEE 802.3 Management are specified in Table 30–1 through Table 30–5.

DTE Management has two packages that are required for management at the minimum conformance configuration—the Basic Package and the Mandatory Package. Systems that implement the optional MAC Control sublayer shall also implement the Basic and Mandatory Packages for the MAC Control Entity managed object class to claim DTE minimum conformance. For systems that include multiple PHY entities per MAC entity and implement the Multiple PHY Package to manage the selection of the active PHY, the optional Recommended Package shall be implemented. Systems that implement the optional Link Aggregation sub-

layer shall also implement the Basic and Mandatory Packages for the Aggregator and Aggregation Port managed object class to claim minimum DTE conformance.

For managed MAUs, the Basic Package is mandatory; all other packages are optional. For a managed MAU to be conformant to this standard, it shall fully implement the Basic Package. For a MAU to be conformant to an optional package it shall implement that entire package. While nonconformant (reference aMAUType = "other") MAUs may utilize some or all of this clause to specify their management, conformance to this clause requires both a conformant MAU and conformant management. MAU Management is optional with respect to all other CSMA/CD Management. If an MII is present then the conditional MII Capability must be implemented. This provides the means to identify the vendor and type of the externally connected device.

There are two distinct aspects of Repeater Management.

The first aspect provides the means to monitor and control the functions of a repeater. These functions include, but are not limited to: identifying a repeater, testing and initializing a repeater, and enabling/disabling a port. This is encompassed by the mandatory Basic Control Capability.

The second aspect provides the means to monitor traffic from attached segments, and to measure traffic sourced by DTEs connected to these segments. This is done by gathering statistics on packets that enter a repeater and maintaining those statistics on a per port basis. This is encompassed by the optional Performance Monitor Capability. The optional Address Tracking Capability provides the means to identify existence and movement of attached DTEs by their MAC addresses. While nonconformant (reference aRepeaterType = "other") repeaters may utilize some or all of this clause to specify their management, conformance to this clause requires both a conformant repeater and conformant management.

If link Auto-Negotiation is present and managed, the Auto-Negotiation managed object class shall be implemented in its entirety. All attributes and actions are mandatory.

The 1000 Mb/s Burst Monitor Capability provides additional attributes that relate only to 1000 Mb/s operation, while the 100 Mb/s Monitor Capability has attributes that apply to a mixed 100 and 1000 Mb/s operation. These attributes are provided to complement the counter attributes of the optional packages and capabilities that apply to 10 Mb/s and mixed 10, 100, and 1000 Mb/s implementations. It is recommended that when the 100/1000 Mb/s Monitor Capability or 1000 Mb/s Burst Monitor Capability is implemented, the appropriate complementary counter packages and capabilities are also implemented.

For managed PSEs and PDs, the PSE Basic Package is mandatory, ~~and~~ the PSE Recommended Package is optional and the PD Basic Package is mandatory. For a managed PSE to be conformant to this standard, it shall fully implement the PSE Basic Package. For a managed PD to be conformant to this standard, it shall fully implement the PD Basic Package. For a managed PSE to be conformant to the optional Recommended Package it shall implement that entire package. PSE and PD management is optional with respect to all other CSMA/CD management.

The DLL Power Clasification Packages for PSEs and PDs are conditional. For Type 1 or Type 2 PSE that implements DLL to be conformant to this standard, it shall fully implement the DLL PSE Power Classification Basic Package. For Type 1 or Type 2 PD that implements DLL to be conformant to this standard, it shall fully implement the DLL PD Power Classification Basic Package.

For managed Midspans, the Midspan managed object class shall be implemented in its entirety. All attributes and notifications are mandatory. Midspan management is optional with respect to all other CSMA/CD management

Replace Table 30-4 with the following (MATT: PLS. CHECK I PRESERVESOLD PACKAGES CORRECTLY) :

Table 30–4—POE Capabilities

			PSE Basic Package (mandatory)	PSE Recommended Package (optional)	Midspan Basic Capability (mandatory)	PD Basic Package (mandatory)	DLL PSE Power Classification Basic Package (conditional)	DLL PD Power Classification Basic Package (conditional)
oResourceTypeID managed object								
aResourceTypeIDName	ATTRIBUTE	GET			X			
aResourceInfo	ATTRIBUTE	GET			X			
oMidSpan managed object class (30.10.1)								
aMidSpanID	ATTRIBUTE	GET			X			
aMidSpanPSEGroupCapacity	ATTRIBUTE	GET			X			
aMidSpanPSEGroupMap	ATTRIBUTE	GET			X			
nMidSpanPSEGroupMapChange	NOTIFICATION				X			
oPSEGroup managed object class (30.10.2)								
aPSEGroupID	ATTRIBUTE	GET			X			
aPSECapacity	ATTRIBUTE	GET			X			
aPSEMap	ATTRIBUTE	GET			X			
nPSEMapChange	NOTIFICATION				X			
oPSE managed object class (30.9.1)								
aPSEID	ATTRIBUTE	GET	X					
aPSEAdminState	ATTRIBUTE	GET	X					
aPSEPowerPairsControlAbility	ATTRIBUTE	GET	X					
aPSEPowerPairs	ATTRIBUTE	GET-SET	X					
aPSEPowerDetectionStatus	ATTRIBUTE	GET	X					
aPSEPowerClassification	ATTRIBUTE	GET		X				
aPSEInvalidSignatureCounter	ATTRIBUTE	GET		X				
aPSEPowerDeniedCounter	ATTRIBUTE	GET		X				
aPSEOverLoadCounter	ATTRIBUTE	GET		X				
aPSEShortCounter	ATTRIBUTE	GET		X				
aPSEMPSAbsentCounter	ATTRIBUTE	GET		X				
acPSEAdminControl	ACTION		X					
aDLLPowerType	ATTRIBUTE	GET					X	
aMirroredDLLPowerType	ATTRIBUTE	GET					X	
aDLLPowerSource	ATTRIBUTE	GET					X	
aMirroredDLLPowerSource	ATTRIBUTE	GET					X	
aMirroredDLLPDPowerPriority	ATTRIBUTE	GET-SET					X	

Table 30–4—POE Capabilities

				PSE Basic Package (mandatory)	PSE Recommended Package (optional)	Midspan Basic Capability (mandatory)	PD Basic Package (mandatory)	DLL PSE Power Classification Basic Package (conditional)	DLL PD Power Classification Basic Package (conditional)
	aMirroredDLLPDRequestedPowerValue	ATTRIBUTE	GET					X	
	aDLLPSEAllocatedPowerValue	ATTRIBUTE	GET					X	
	aLostCommunication	ATTRIBUTE	GET					X	
	aMirroredLostCommunication	ATTRIBUTE	GET					X	
oPD managed object class (30.9.2)									
	aPDID	ATTRIBUTE	GET				X		X
	aDLLPowerType	ATTRIBUTE	GET				X		X
	aMirroredDLLPowerType	ATTRIBUTE	GET						X
	aDLLPowerSource	ATTRIBUTE	GET						X
	aMirroredDLLPowerSource	ATTRIBUTE	GET						X
	aDLLPDPowerPriority	ATTRIBUTE	GET-SET				X		X
	aDLLPDRequestedPowerValue	ATTRIBUTE	GET						X
	aMirroredDLLPSEAllocatedPowerValue	ATTRIBUTE	GET						X
	aLostCommunication	ATTRIBUTE	GET						X
	aMirroredLostCommunication	ATTRIBUTE	GET						X
Common Attributes Template									
	aCMCounter	ATTRIBUTE	GET		X				

Rename title of section 30.9 as follows:

30.9 Management for Power over Ethernet (PoE)

30.9.1 PSE managed object class

This subclause formally defines the behaviours for the oPSE managed object class attributes and actions.

Insert new subclauses after subclause 30.9.1.1.11:

30.9.1.1 DTE Power via MDI PSE classification extention attributes

30.9.1.1.12 aDLLPowerType

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PD	Powered Device (see 33.3).
PSE	Power Sourcing Equipment (see 33.2).

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested DTE Power via MDI type of the local system.;

30.9.1.1.13 aMirroredDLLPowerType

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PD	Powered Device (see 33.3).
PSE	Power Sourcing Equipment (see 33.2).

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested DTE Power via MDI type of the remote system.;

30.9.1.1.14 aDLLPowerSource

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PSE and local	A PD being powered both locally and by a PSE
Local	A PD being powered locally only
PSE	A PD being powered by a PSE
Backup source	A PSE being powered by a backup source
Primary power source	A PSE being powered by its primary power source
Unknown	A PD or PSE where the power source is unknown

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested power source of the local system.;

30.9.1.1.15 aMirroredDLLPowerSource

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PSE and local	A PD being powered both locally and by a PSE
Local	A PD being powered locally only
PSE	A PD being powered by a PSE
Backup source	A PSE being powered by a backup source
Primary power source	A PSE being powered by its primary power source
Unknown	A PD or PSE where the power source is unknown

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested power source of the remote system.;

30.9.1.1.16 aMirroredDLLPDPowerPriority

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

low	low priority PD
high	high priority PD
critical	critical priority PD
unknown	priority unknown

BEHAVIOUR DEFINED AS:

A GET operation returns the priority of the PD system.

A SET operation changes the priority of the PD system to the indicated value.;

30.9.1.1.17 aMirroredDLLPDRequestedPowerValue

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested PD power value. The requested PD power value for a PD is the new maximum input average power (see 33.3.7.2) the PD will ever draw under this power allocation if it is accepted. The PD requested power value for a PSE is the new maximum input average power it wants the PD to ever draw under this power allocation if it is accepted. The requested PD power value is encoded according to Equation (33–16), where *X* is the decimal value of aMirroredDLLPDRequestedPowerValue.;

30.9.1.1.18 aDLLPSEAllocatedPowerValue

ATTRIBUTE

APPROPRIATE SYNTAX:

Same as aDLLPDRequestedPowerValue.

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PSE allocated power value for the PD. The power value is the maximum input average power (see 33.3.7.2) the PD will ever draw under the current power allocation. The power value is encoded according to equation Equation (33–16), where *X* is the decimal value of aDLLPSEAllocatedPowerValue.;

30.9.1.1.19 aLostCommunication

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresetable counter. This counter has a maximum increment rate of 1 count per second.

BEHAVIOUR DEFINED AS:

Increment counter by one each time a loss of management frame communication occurs as defined in subclause 33.8 on the local system.;

30.9.1.1.20 aMirroredLostCommunication

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresetable counter. This counter has a maximum increment rate of 1 count per second.

BEHAVIOUR DEFINED AS:

A GET operation that returns the value of the counter on the remote system. Counter increments by one each time a loss of management frame communication occurs as defined in subclause 33.8.;

Insert new subclauses after subclause 30.9.1.2.1:

30.9.2 PDmanaged object class

30.9.2.1 PD attributes

30.9.2.1.1 aPDID

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

The value of PDID is assigned so as to uniquely identify a PD Power via MDI classification local system among the subordinate managed objects of the containing object.;

30.9.2.1.2 aDLLPowerType

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PD Powered Device (see 33.3).
PSE Power Sourcing Equipment (see 33.2).

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested DTE Power via MDI type of the local system.;

30.9.2.1.3 aMirroredDLLPowerType

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PD Powered Device (see 33.3).
PSE Power Sourcing Equipment (see 33.2).

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested DTE Power via MDI type of the remote system.;

30.9.2.1.4 aDLLPowerSource

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PSE and local A PD being powered both locally and by a PSE
Local A PD being powered locally only
PSE A PD being powered by a PSE

Backup source	A PSE being powered by a backup source
Primary power source	A PSE being powered by its primary power source
Unknown	A PD or PSE where the power source is unknown

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested power source of the local system.;

30.9.2.1.5 aMirroredDLLPowerSource

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

PSE and local	A PD being powered both locally and by a PSE
Local	A PD being powered locally only
PSE	A PD being powered by a PSE
Backup source	A PSE being powered by a backup source
Primary power source	A PSE being powered by its primary power source
Unknown	A PD or PSE where the power source is unknown

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested power source of the remote system.;

30.9.2.1.6 aDLLPDPowerPriority

ATTRIBUTE

APPROPRIATE SYNTAX:

An ENUMERATED value list that has the following entries:

low	low priority PD
high	high priority PD
critical	critical priority PD
unknown	priority unknown

BEHAVIOUR DEFINED AS:

A GET operation returns the current priority of the PD system.

A SET operation changes the priority of the PD system to the indicated value.;

30.9.2.1.7 aDLLPDRequestedPowerValue

ATTRIBUTE

APPROPRIATE SYNTAX:

INTEGER

BEHAVIOUR DEFINED AS:

A GET attribute that returns the requested PD power value. The requested PD power value for a PD is the new maximum input average power (see 33.3.7.2) the PD will ever draw under this power allocation if it is accepted. The PD requested power value for a PSE is the new maximum input average power it wants the PD to ever draw under this power allocation if it is accepted. The requested PD power value is encoded according to Equation (33–16), where *X* is the decimal value of aDLLPDRequestedPowerValue.;

30.9.2.1.8 aMirroredDLLPSEAllocatedPowerValue

ATTRIBUTE

APPROPRIATE SYNTAX:

Same as aDLLPDRequestedPowerValue.

BEHAVIOUR DEFINED AS:

A GET attribute that returns the PSE allocated power value for the PD. The power value is the maximum input average power (see 33.3.7.2) the PD will ever draw under the current power allocation. The power value is encoded according to equation Equation (33–16), where *X* is the decimal value of aMirroredDLLPSEAllocatedPowerValue.;

30.9.2.1.9 aLostCommunication

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresetable counter. This counter has a maximum increment rate of 1 count per second.

BEHAVIOUR DEFINED AS:

Increment counter by one each time a loss of management frame communication occurs as defined in subclause 33.8 on the local system.;

30.9.2.1.10 aMirroredLostCommunication

ATTRIBUTE

APPROPRIATE SYNTAX:

Generalized nonresetable counter. This counter has a maximum increment rate of 1 count per second.

BEHAVIOUR DEFINED AS:

A GET operation that returns the value of the counter on the remote system. Counter increments by one each time a loss of management frame communication occurs as defined in subclause 33.8.;