

IEEE P802.3dg2.1

Miscellaneous changes

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2 Clause 30 Overview, Capabilities and Containment

2.1 Text description of managed objects

Replace the oAutoNegotiation entry text in 30.2.2.1 with the following:

If implemented, oAutoNegotiation is contained within oMAU. The oAutoNegotiation managed object class provides the controls necessary to manage the instance of Auto-Negotiation.

Add the following to the list in 30.2.2.1 following oAutoNegotiation

oAutoNegDownshift

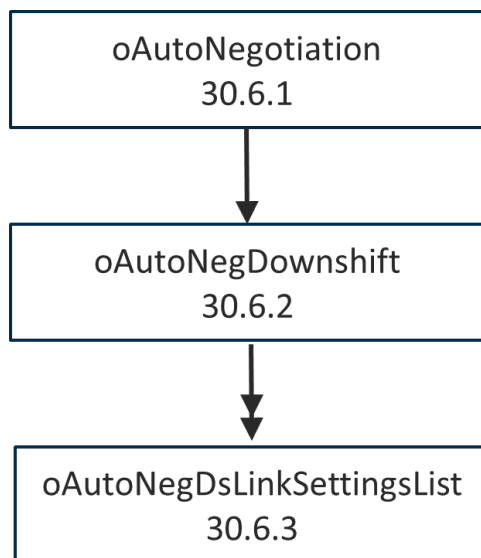
If implemented, oAutoNegDownshift is contained within oAutoNegotiation. The oAutoNegDownshift managed object class provides the controls necessary to manage the Downshift/Upshift functions of Auto-Negotiation.

oAutoNegDsLinkSettingsList

If implemented, oAutoNegDsLinkSettingsList is contained within oAutoNegDownshift. The oAutoNegDsLinkSettingsList managed object class provides additional controls necessary to manage the Downshift/Upshift functions of Auto-Negotiation.

2.2 Downshift/Upshift Containment

Change Figure 30–3 by adding oAutoNegDownshift and oAutoNegDsLinkSettingsList within oAutoNegotiation as follows:.



2.3 Downshift Capabilities

Insert a new column to the right of “Auto-Negotiation Package (mandatory)” labelled “Auto-Negotiation Downshift package (optional) ”,

Insert the following rows to ‘Table 30–1e—Capabilities’ after the row for acAutoNegAdminControl while adjusting for other amendments as needed.

Name			Other packages	Auto-Negotiation Downshift package (optional)
oAutoNegDownshift managed object class (30.6.2)				
aAutoNegDownshiftUpshiftSupported	ATTRIBUTE	GET		X
aAutoNegDownshiftControl	ATTRIBUTE	GET-SET		X
aAutoNegUpshiftControl	ATTRIBUTE	GET-SET		X
aAutoNegDownshiftThreshold	ATTRIBUTE	GET		X
aAutoNegDownshiftPeriod	ATTRIBUTE	GET-SET		X
aAutoNegDownshiftRestartPeriod	ATTRIBUTE	GET-SET		X
aAutoNegUpshiftPeriod	ATTRIBUTE	GET-SET		X
aAutoNegDownshiftAttempts	ATTRIBUTE	GET		X
aAutoNegDownshiftRestarts	ATTRIBUTE	GET		X
aAutoNegUpshiftAttempts	ATTRIBUTE	GET		X
oAutoNegDsLinkSettingsList managed object class (30.6.3)				
aAutoNegLinkSettingsListEntry	ATTRIBUTE	GET-SET		X

3 Downshift/Upshift Admin/State

Addresses(at least) comments: 163, 119,125

Change the Downshift/Upshift “Control” attributes to use the common pattern of AdminControl/AdminState.

3.1 Attributes and Actions

Delete 30.6.2.1.2 and 30.6.2.1.3 and replace them with

30.6.2.1.2 aAutoNegDownshiftAdminState

ATTRIBUTE

APPROPRIATE SYNTAX:

enabled
disabled

BEHAVIOUR DEFINED AS:

This read-only attribute reports if downshift is enabled (see 45.2.7.29.2).;

30.6.2.1.3 aAutoNegUpshiftAdminState

ATTRIBUTE

APPROPRIATE SYNTAX:

enabled
disabled

BEHAVIOUR DEFINED AS:

This read-only attribute reports if upshift is enabled(see 45.2.7.29.3).;

Add new subclause 30.6.2.2 for downshift/upshift actions.

30.6.2.2 Auto-Negotiation downshift/upshift actions

30.6.2.2.2 aAutoNegDownshiftAdminControl

ATTRIBUTE

APPROPRIATE SYNTAX:

Same as aAutoNegDownshiftAdminState

BEHAVIOUR DEFINED AS:

This action is used to enable or disable downshift(see 45.2.7.28.1). This is reflected in aAutoNegDownshiftAdminState.;

30.6.2.2.3 aAutoNegUpshiftAdminControl

ATTRIBUTE

APPROPRIATE SYNTAX:

Same as aAutoNegUpshiftAdminState.

BEHAVIOUR DEFINED AS:

This action is used to enable or disable upshift (see 45.2.7.28.2). This is

reflected in `aAutoNegUpshiftAdminState`.;

3.2 Capabilities

Modify ‘Table 30–1e—Capabilities’ (unchanged rows not shown).

Name			Other packages	Auto-Negotiation Downshift package (optional)
aAutoNegDownshiftControl	ATTRIBUTE	GET-SET		✗
aAutoNegUpshiftControl	ATTRIBUTE	GET-SET		✗
<u>aAutoNegDownshiftAdminState</u>	ATTRIBUTE	GET		<u>X</u>
<u>aAutoNegUpshiftAdminState</u>	ATTRIBUTE	GET		<u>X</u>
<u>aAutoNegDownshiftAdminControl</u>	ACTION	GET-SET		<u>X</u>
<u>aAutoNegUpshiftAdminControl</u>	ACTION	GET-SET		<u>X</u>

NOTE: this change builds on the change in 2.3. These changes are applied after those changes.

3.3 Registers

Change Table 45–402b as shown (unchanged rows not shown):

Table 45–402b—BASE-T1 downshift status register bit definitions

Bit(s)	Name	Description	R/W
7.529.14	Downshift status	1 = enabled 0 = disabled	RO
7.529.13	Upshift status	1 = enabled 0 = disabled	RO
7.529.12:0	Reserved	Value always 0	RO

Add the following subclauses after 45.2.7.29.1.

45.2.7.29.2 Downshift status (7.529.14)

Bit 7.529.14 reports whether downshift is enabled, see 98D.2.6.

45.2.7.29.3 Upshift status (7.529.13)

Bit 7.529.13 reports whether upshift is enabled, see 98D.2.6.

3.4 MDIO mapping

Change Table 98D–1 as shown (unchanged rows not shown):

Variable	Description
mr_ds_downshift_enabled	7.528.15 downshift enabled 7.529.14 downshift status
mr_ds_upshift_enabled	7.528.14 upshift enabled 7.529.13 upshift status

4 Other Changes

4.1 PoDL system types

Addresses comment: 132

Replace the second paragraph of 104.1.3

A Type A or Type C PSE and Type A or Type C PD are compatible with 10BASE-T1S and 100BASE-T1 PHYs.
A Type B or Type C PSE and Type B or Type C PD are compatible with 1000BASE-T1 PHYs.
A Type C PSE and Type C PD are compatible with 10BASE-T1S, 100BASE-T1, and 1000BASE-T1 PHYs.
Type D PSEs and Type D PDs may be incompatible with IEEE 802.3 PHYs and may lack a data entity.
A Type E PSE and Type E PD are compatible with 10BASE-T1L PHYs.
A Type F PSE and Type F PD are compatible with 2.5GBASE-T1, 5GBASE-T1, 10GBASE-T1, and 25GBASE-T1 PHYs.
A Type G PSE and Type G PD are compatible with 100BASE-T1L PHYs.
A Type H PSE and Type H PD are compatible with 10BASE-T1L and 100BASE-T1L PHYs.

With the following text and table.

Individual PoDL system types are compatible with 0, 1 or more 802.3 PHYs(see Table 104-0a).

Table 104-0a–System type compatible PHYs

System Type	Compatible PHYs
Type A PSE/PD	10BASE-T1S 100BASE-T1
Type B PSE/PD	1000BASE-T1
Type C PSE/PD	10BASE-T1S 100BASE-T1 1000BASE-T1
Type D PSE/PD	These system types may be incompatible with IEEE 802.3 PHYs and may lack a data entity
Type E PSE/PD	10BASE-T1L
Type F PSE/PD	2.5GBASE-T1 5GBASE-T1 10GBASE-T1 25GBASE-T1
Type G PSE/PD	100BASE-T1L
Type H PSE/PD	10BASE-T1L 100BASE-T1L

4.2 Single Pair AN Transmit function requirements

Addresses comment: 131

Replace the paragraph beginning “Two different Auto-Negotiation ...” with

Two different Auto-Negotiation speeds are defined in this subclause. A PHY shall support at least one of these Auto-Negotiation speeds. The two speeds are referred to as high-speed mode, or HSM, and low-speed mode, or LSM. For link segments with high insertion loss and those requiring 10BASE-T1L or 100BASE-T1L, LSM is provided to enable the full reach capability

If Auto-Negotiation is implemented, 1000BASE-T1, 100BASE-T1, and 10BASE-T1S PHYs shall support HSM and may optionally support LSM. If Auto-Negotiation is implemented, 10BASE-T1L PHYs and 100BASE-T1L PHYs shall support LSM and may optionally support HSM.

When performing Auto-Negotiation in high-speed mode, DME pages are transmitted at a nominal rate of 16.667 Mb/s. In low-speed mode, DME pages are transmitted at a nominal rate of 625 kb/s. Subclause 98.5.6 describes the behavior to automatically choose between the different Auto-Negotiation speeds when a PHY supports both.

5 Downshift/Upshift vs Downshift or Upshift

The text in Clauses 30, 45 and Annex 94D is inconsistent when it uses “downshift”. Sometimes it means just downshift, and sometimes it means downshift and upshift. The following text provides a set of changes to clean this up. Anywhere that downshift is used to mean both downshift and upshift has been updated.

These changes build on top of the changes shown in sections 2,3 and 4.

Addresses(at least) comments: 65, 74, 144, 151, 153

5.1 Intro material

Replace the paragraph on page 152 line 11 that starts “This annex specifies ..” with the paragraphs below. The current text assumes people know what downshift/upshift are.

This annex specifies optional downshift/upshift functionality for BASE-T1L PHYs.

Downshift/upshift enables a system to select a set of link parameters that are optimized for the link segment characteristics at a point in time, even if that’s not what Auto-Negotiation would have selected. As an example, if both link partners support 10BASE-T1L and 100BASE-T1L, Auto-Negotiation will select 100BASE-T1L. If the current link segment performance does not support 100BASE-T1L, downshift/upshift enables the link partners to “downshift” to run 10BASE-T1L allowing for continued data exchange across the link at a lower speed. Later in time when the link segment characteristics may have improved such that 100BASE-T1L could be supported, the link partners can “upshift” to 100BASE-T1L.

A PHY either supports both downshift and upshift, or neither downshift nor upshift. When the text refers to both functions, it uses “downshift/upshift”, “downshift_upshift” or similar.

5.2 Annex 98D State Diagram

5.2.1 Downshift & Upshift Specific Variable Names

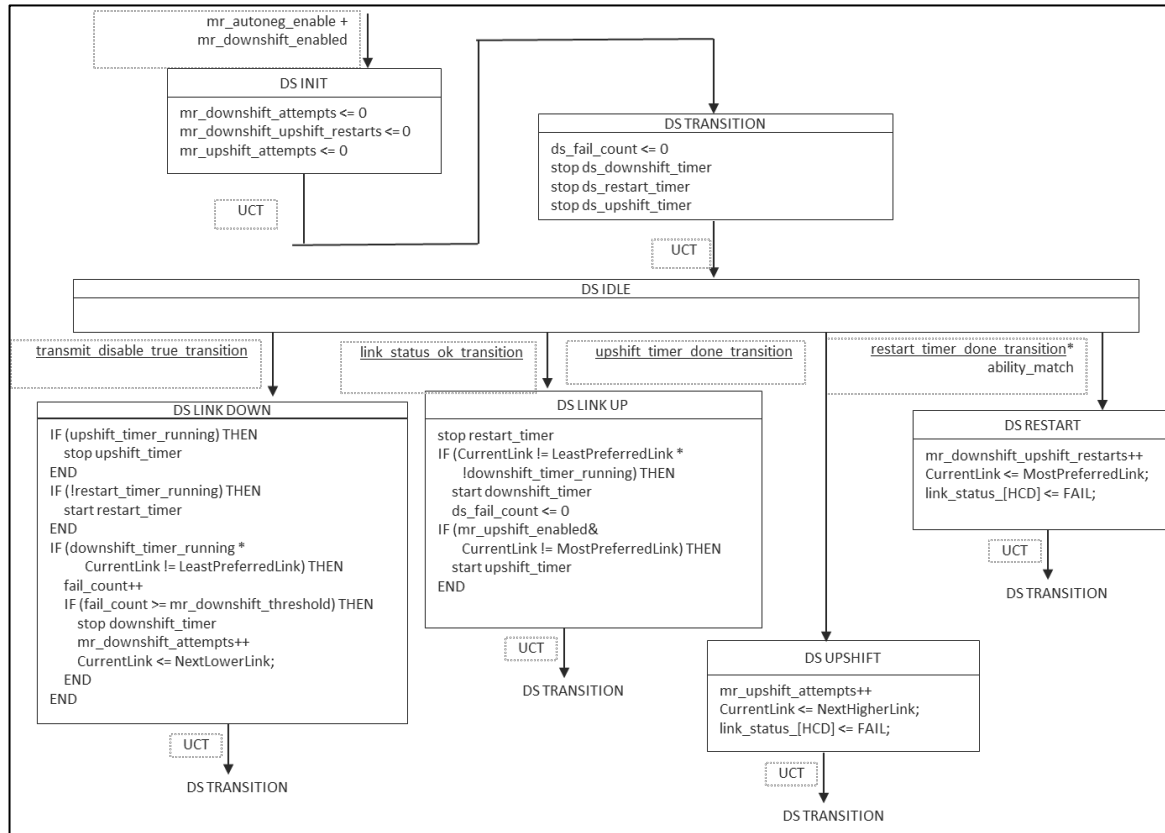
Change the variable names in Annex 98D from “mr_ds_” to “mr_”.The “ds_” is a leftover from when I was adding these functions into the main clause 98 state diagrams. In addition to removing “ds_”, change downshift/upshift variable names to include both functions

In 98D.2 and 98D.3, change the following names:

mr_ds_downshift_enabled	-> mr_downshift_enabled
mr_ds_upshift_enabled	-> mr_upshift_enabled
mr_ds_period_downshift	-> mr_period_downshift
mr_ds_fail_threshold	-> mr_downshift_threshold
mr_ds_period_restart	-> mr_period_restart
mr_ds_period_upshift	-> mr_period_upshift
mr_ds_downshift_attempts	-> mr_downshift_attempts
mr_ds_upshift_attempts	-> mr_upshift_attempts
mr_ds_downshift_supported	-> mr_downshift_upshift_supported
mr_ds_restarts	-> mr_downshift_upshift_restarts

5.2.2 State diagram

Replace Figure 98D-1—Downshift state diagram with the following(updated from jones_3dg_d2p1_downshift_0.pdf with name changes):



5.2.3 Other changes

In 98D.2.6, change the first sentence to be:

Table 98D-1 specifies the mapping between state diagram variables and MDIO registers.

Change the title of Table 98D-1 to:

State diagram variable to MDIO register mapping

In 98D.2.7, change the following:

Downshift -> Downshift/upshift

In 98D.3, change the following:

DNSFT -> DNUPSFT

In 98D.3.3, change the Value/Comment text to be

PHY supports downshift/upshift

mr_downshift_upshift_supported

In 98D.3.4.2, remove UPSFT1 and renumber.

5.3 Clause 45

In 45.2.7.31 change the following:

downshift restart

-> downshift/upshift restart

Restart period

-> Downshift/upshift restart period

In 45.2.7.34 change the following:

downshift restarts

-> downshift/upshift restarts

Downshift restarts

-> Downshift/upshift restarts

In 45.2.7.36 and 45.2.7.37 change the following:

downshift preference

-> downshift/upshift preference

6 Clause 30 links to Clause 98D

Addresses (at least) comments:162, 164-170, 120, 121

Change the “BEHAVIOUR DEFINED AS” text for the following attributes in 30.6.2 and 30.6.3 as follows. These changes build on the changes in the previous sections.

`aAutoNegDownshiftUpshiftSupported`
Reports if an interface supports downshift/upshift (see 98D.2.6 `mr_downshift_upshift_supported`).;

`aAutoNegDownshiftAdminState`
This read-only attribute reports if downshift is enabled (see 98D.2.6 `mr_downshift_enabled`).;

`aAutoNegUpshiftAdminState`
This read-only attribute reports if upshift is enabled(see 98D.2.6 `mr_upshift_enabled`).;

`aAutoNegDownshiftThreshold`
The number of link failures within the trigger period that will trigger downshift(see 98D.2.6 `mr_downshift_threshold`). The default value is 8. Value range is 1 to 255, inclusive.;

`aAutoNegDownshiftPeriod`
The period in seconds used to evaluate the number of link failures to trigger downshift(see 98D.2.6 `mr_period_downshift`). The default value is 8. Value range is 1 to 255, inclusive.;

`aAutoNegDownshiftUpshiftRestartPeriod`
The period in seconds used to evaluate restarting the downshift/upshift process (see 98D.2.6 `mr_period_restart`). The default value is 256. Value range is 1 to 4095, inclusive.;

`aAutoNegUpshiftPeriod`
The period in seconds used to evaluate the number of link failures to trigger upshift(see 98D.2.6 `mr_period_upshift`). The default value is 8. Value range is 1 to 255, inclusive.;

`aAutoNegDownshiftAttempts`
The number of downshift attempts on the interface(see 98D.2.6 `mr_downshift_attempts`).;

`aAutoNegDownshiftUpshiftRestarts`
The number of downshift/upshift restarts on the interface(see 98D.2.6 `mr_downshift_upshift_restarts`).;

`aAutoNegUpshiftAttempts`
The number of upshift attempts on the interface(see 98D.2.6 `mr_downshift_upshift_restarts`).;

`aAutoNegDownshiftAdminControl`
This action is used to enable or disable downshift (see 98D.2.6 `mr_downshift_enabled`). This is reflected in `aAutoNegDownshiftAdminState`.;

`aAutoNegUpshiftAdminControl`

This action is used to enable or disable upshift (see 98D.2.6
mr_upshift_enabled). This is reflected in aAutoNegUpshiftAdminState.;

aAutoNegLinkSettingsListEntry

The link settings of this entry in the downshift/upshift preference list (see
98D.2.7).;

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