Adjacent SIGNAL_OK
(follow up on comment #356 against D1.3)

Adee Ran, Cisco

Comment and the existing definitions

Cl **178B** *SC* **178B.14.2.1** *P* **783** *L* **10** # 356

Ran, Adee Cisco

Comment Type **TR** *Comment Status* **R** *State diagram*

The NOTE about SIGNAL_OK seems to apply not just the adjacent_isl_ready but also to adjacent_remote_rts.
Also, "the other interface of the device" is not defined for an endpoint (when client_is_pcs is true).

Also, I am not sure the concept of "other interface" is fully defined for the case of an optical module, where one interface is the PMD and the other interface is a PMA. Neither the NOTE nor the text in 178B.5 address this case.

SuggestedRemedy

Define an additional variable adjacent_signal_ok whose value is taken from the parameter of the appropriate primitive (as the current note explains) and is undefined when client_is_pcs is true.
Redefine adjacent_remote_rts and adjacent_isl_ready based on the new variable.

Add whatever is needed to cover the optical module case.

Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

What is “the other interface of the device”?

178B.14.2.1 Variables

adjacent_remote_rts

Boolean variable that indicates the value of remote_rts on the other interface of the device. It is set to true if the parameter SIGNAL_OK is OK and to false otherwise.

adjacent_isl_ready

Boolean variable that indicates the value of isl_ready on the other interface of the device. It is set to true if the parameter SIGNAL_OK is OK or READY and to false otherwise.

NOTE – SIGNAL_OK is received via the IS_SIGNAL.request primitive for an AUI component above an AUI channel or a PMD, or via the IS_SIGNAL.indication primitive for an AUI component below an AUI channel.

The note applies to both variables

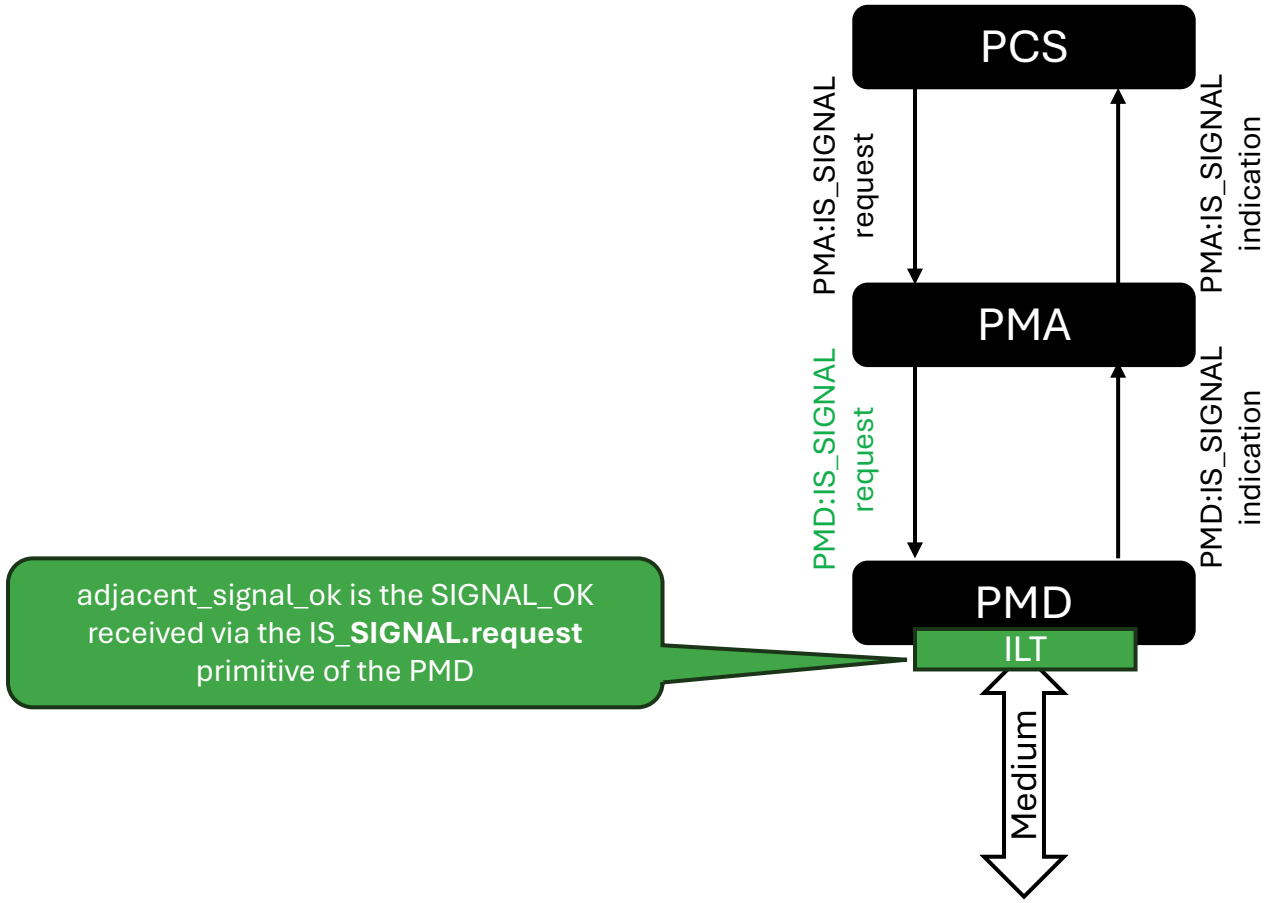
What are these variables for

- adjacent_isl_ready and adjacent_remote_rts are used by ILT to propagate the RTS information between ISLs.
- These variables were originally defined when ILT was supposed to be a function of the PMA…
  - Thus the definition includes “the other interface”.
- In the current architecture, ILT is a function of PMDs and AUIs.
  - Between a PMD and an AUI there are sublayers with additional functionality – a PMA and possibly an inner FEC.
  - This functionality is part of the “ready” indication (see backup slide).
  - Taking a signal from “The other interface” does not make sense anymore.
- The variables should be defined by reference to **service interface primitives**.

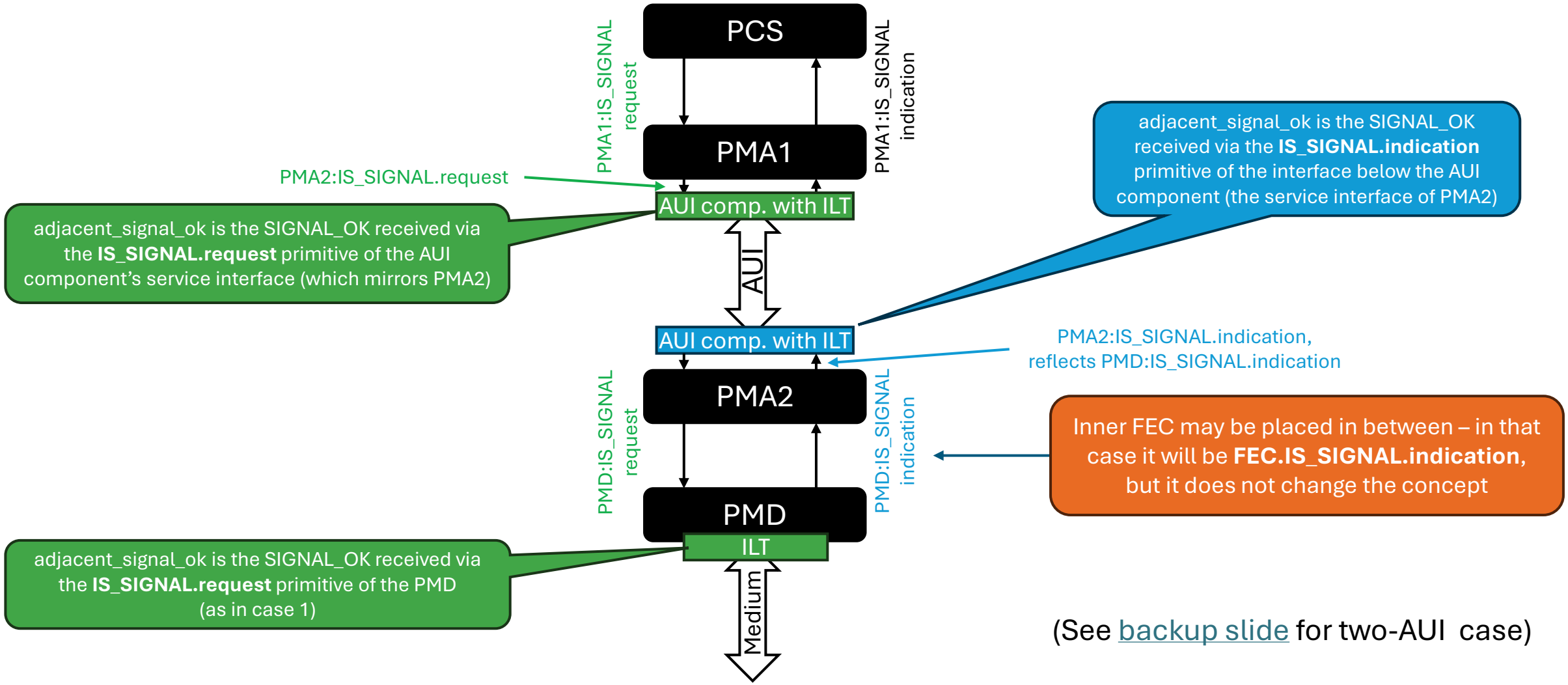
How this can be clarified

- Define a new variable, **adjacent_signal_ok**, which will be used to derive both **adjacent_remote_rts** and **adjacent_isl_ready**.
- The new variable is taken from SIGNAL_OK of either IS_SIGNAL.request or IS_SIGNAL.indication, depending on the position of the ILT function:
  - For “downward” ILT (in a PMD or AUI component), it is IS_SIGNAL.request of the service interface of the PMD or AUI component.
  - For “upward” ILT (only in an AUI component), it is IS_SIGNAL.indication of the interface below the AUI component (the service interface of the PMA below, which eventually reflects the service interface of the PMD).
- This is illustrated in the next slides.

Case 1: No AUI


PCS
PMA:IS_SIGNAL request
PMA:IS_SIGNAL indication
PMA
PMD:IS_SIGNAL request
PMD:IS_SIGNAL indication
PMD
ILT
Medium
adjacent_signal_ok is the SIGNAL_OK received via the IS_**SIGNAL.request** primitive of the PMD

Case 2: one AUI (2 PMAs)



(See backup slide for two-AUI case)

IS_SIGNAL.request

- The figures above show **PMA:IS_SIGNAL.request** primitives beneath the PCS.
- IS_SIGNAL.request is a service interface primitive of the PMD, PMA, and inner FEC sublayers
  - The primitive is described in 116.3.3.4 (added by P802.3dj) – see backup slide
- The logic for generating IS_SIGNAL.request by the client sublayer is described in detail when the client sublayer is SM-PMA (in 176.3), Inner FEC (177.3), or AUI component (176C.3 or 176D.3), and it appears under these sublayers in functional and service interface diagrams.
- The logic for generating it when the client is the PCS (PMA:IS_SIGNAL.request) is not described…
  - But it is simple: the PCS generates FAIL when it does not transmit data (e.g., PCS_reset is true), and OK otherwise.
  - This can be understood from the description in 116.3.3.4, without further addition in the PCS clauses.
- However, this primitive is not shown in many service interface diagrams (unlike PMA:IS_SIGNAL.indication).
  - It is proposed to add it where it is missing.

Proposed definition changes in 178B.14.2.1

adjacent_signal_ok

Enumerated variable derived from the value of the SIGNAL_OK parameter on the adjacent service interface. It takes one of the following values: IN_PROGRESS, READY, OK, FAIL.

NOTE—For ILT in a PMD or an AUI component below a PMA, the adjacent service interface is the service interface of the PMD or AUI component, and SIGNAL_OK is received via the IS_SIGNAL.request primitive. For ILT in an AUI component above a PMA, the adjacent service interface is the interface below the AUI component, and SIGNAL_OK is received via the IS_SIGNAL.indication primitive.

adjacent_remote_rts

Boolean variable that indicates the value of remote_rts on the ~~other~~ adjacent service interface ~~of the device~~. It is ~~set to~~ true if ~~the parameter SIGNAL_OK~~ adjacent_signal_ok is OK and ~~to~~ false otherwise

adjacent_isl_ready

Boolean variable that indicates the value of isl_ready on the ~~other~~ adjacent service interface ~~of the device~~. It is ~~set to~~ true if ~~the parameter SIGNAL_OK~~ adjacent_signal_ok is OK or READY and ~~to~~ false otherwise.

~~NOTE—SIGNAL_OK is received via the IS_SIGNAL.request primitive for an AUI component above an AUI channel or a PMD, or via the IS_SIGNAL.indication primitive for an AUI component below an AUI channel.~~

Proposed figure changes

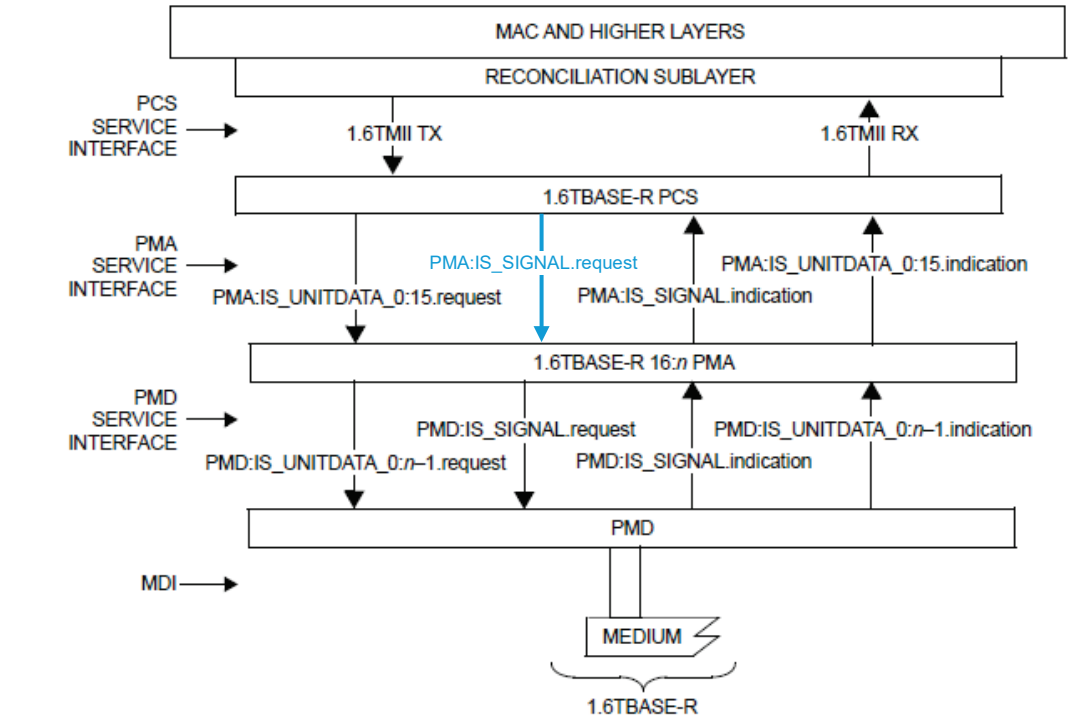
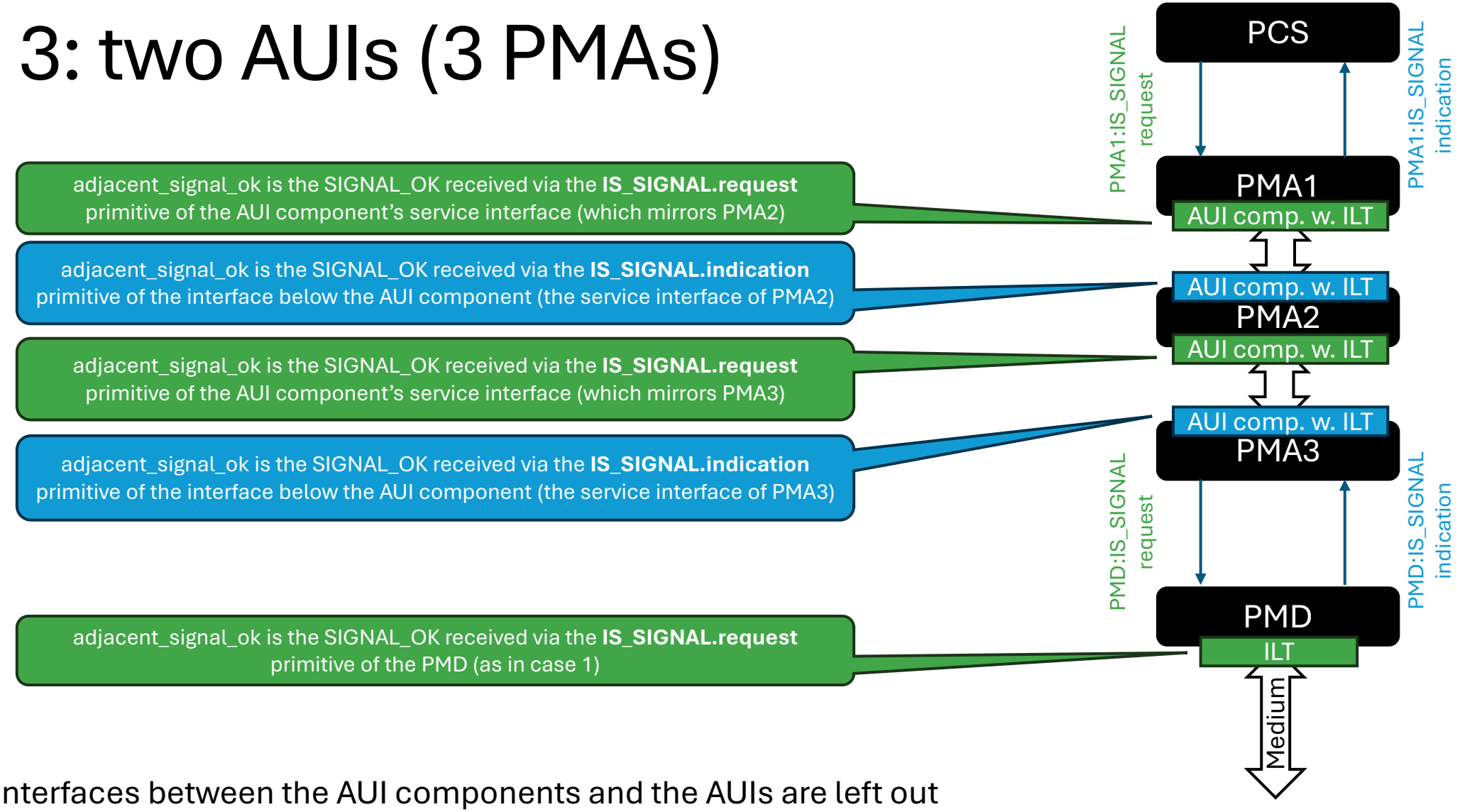


Figure 174–2—Inter-sublayer service interfaces for a 1.6TBASE-R PHY

- Similar arrows should be added in all inter-sublayer service interface diagrams:
  - Figure 116–2, Figure 116–2a, Figure 116–3, Figure 116–3a
  - Figure 169–2, Figure 169–2a, Figure 169–3 (twice)
  - Figure 174–2 (shown), Figure 174–3 (twice), Figure 174–4
  - Figure 185–2 (FEC service interface), Figure 185–3 (both PMA and FEC)
- And in functional block diagrams:
  - Figure 119–2 (not in the draft)
  - Figure 172–2
  - Figure 175–2

Backup

Case 3: two AUIs (3 PMAs)



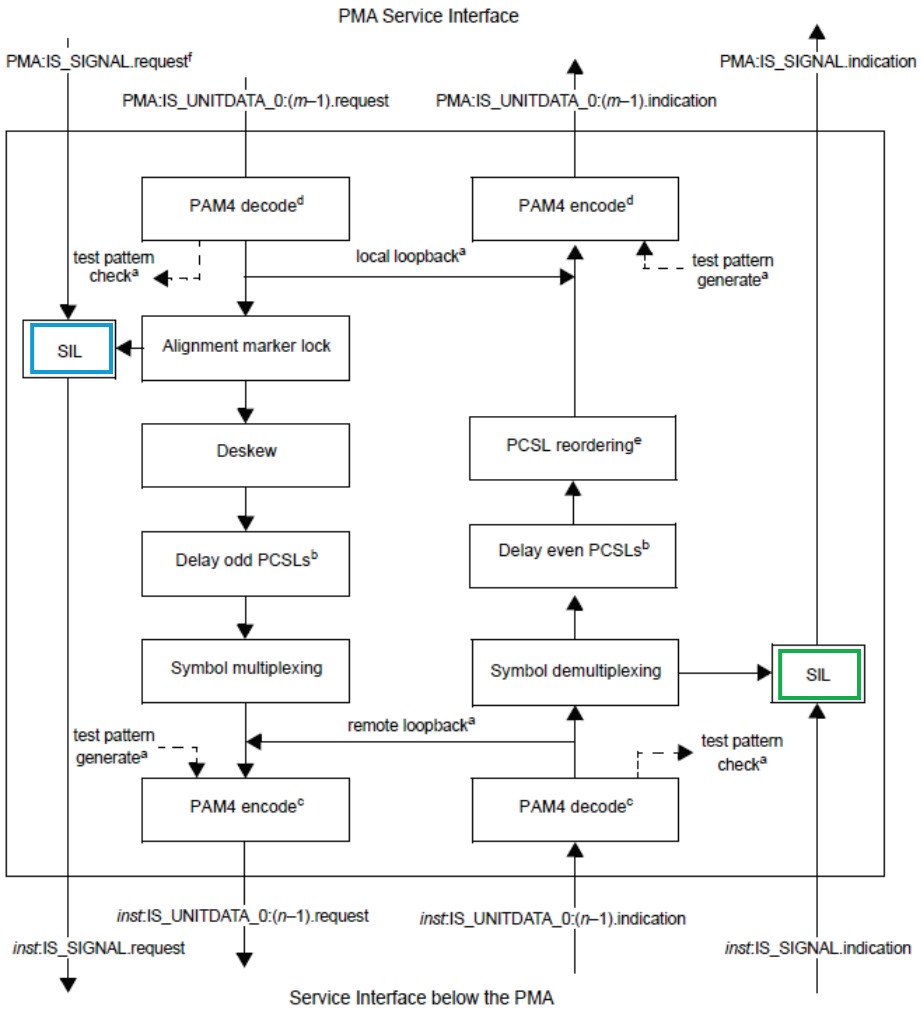
For brevity, interfaces between the AUI components and the AUIs are left out

Definition of IS_SIGNAL.request (added by P802.3dj)

116.3.3.4 IS_SIGNAL.request

The IS_SIGNAL.request primitive is generated by the transmit process to propagate the detection of severe error conditions (e.g., no valid signal being received by the sublayer) to the next lower sublayer and to indicate the ILT status for Physical Layer implementations that use the ILT function defined in Annex 178B.

- "received by the sublayer" is a mistake – it is in the transmit direction so it should be "transmitted".
- a comment will be submitted



inst: PMA or PMD or FEC or AUI
SIL: Signal indication logic

[a] Optional
[b] If 200GBASE-R, 400GBASE-R or 800GBASE-R
[c] If the sublayer below the PMA is an AUI or PMD
[d] If the sublayer above the PMA is a 1.6TAUI-16
[e] If the sublayer above the PMA is an 800GBASE-R BM-PMA
[f] PMA:IS_SIGNAL.request is not present when the sublayer above the PMA is a PCS or DTE XS

m = 8 (200GBASE-R), 16 (400GBASE-R), 32 (800GBASE-R), or 16 (1.6TBASE-R)
n = 1 (200GBASE-R), 2 (400GBASE-R), 4 (800GBASE-R), or 8 (1.6TBASE-R)

Figure 176–2—200GBASE-R 8:1, 400GBASE-R 16:2, 800GBASE-R 32:4, 1.6TBASE-R 16:8 PMAs functional block diagram

The “signal on the other interface” cannot be used by itself

Table 176–5—PMA:IS_SIGNAL.indication(SIGNAL_OK) generation

inst:IS_SIGNAL.indication[a] SIGNAL_OK	align_status_mux[b] or all_locked_demux[c]	PMA:IS_SIGNAL.indication SIGNAL_OK
OK	true	OK
OK	false	READY
READY	don't care	READY
IN_PROGRESS	don't care	IN_PROGRESS
FAIL	don't care	FAIL

[a] From the sublayer below the PMA.
[b] For n:m PMAs (see 176.4.4.2.1).
[c] For m:n PMAs (see 176.4.4.2.1).

Table 176–6—inst:IS_SIGNAL.request(SIGNAL_OK) generation

PMA:IS_SIGNAL.request[a] SIGNAL_OK	align_status_mux[b] or all_locked_demux[c]	*inst*:IS_SIGNAL.request[d] SIGNAL_OK
OK	true	OK
OK	false	READY
READY	don't care	READY
IN_PROGRESS	don't care	IN_PROGRESS
FAIL	don't care	FAIL
no primitive[e]	true	OK
no primitive[e]	false	READY

[a] From the sublayer above the PMA.
[b] For m:n PMAs (see 176.4.4.2.1).
[c] For n:m PMAs (see 176.4.4.2.1).
[d] To the service interface below the PMA.
[e] When PMA:IS_SIGNAL.request input is not present. For example, when the sublayer above the PMA is a PCS or DTE XS.