DLMS Event Notification

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00000-A

Revision History

Rev.	Date	Description	
		Slide No.	Summary
1.00	Mar 20, 2014	All	Initialized revision

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Outline

- Overview
- Implementation
- Appendix

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Overview

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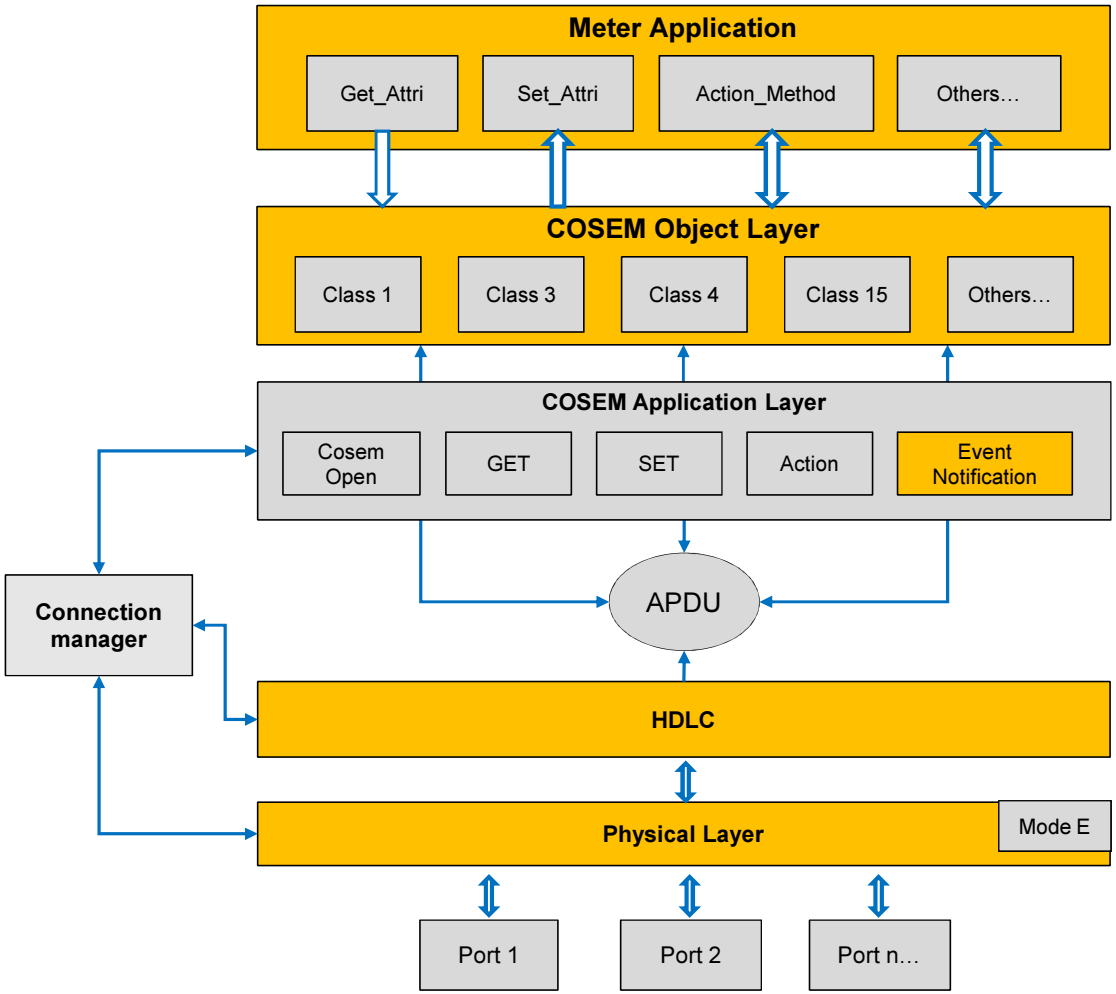
Event notification



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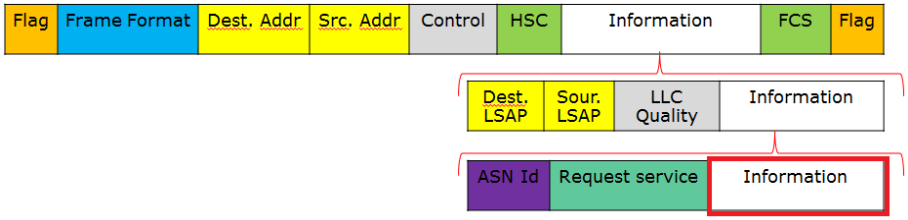
Event notification



- Information (I) frame

Ex:

7EA02A030002002103CE49E6E700C201000001000061610 0FF020408024D157E4D157E

Time (optional)	COSEM attribute descriptor	Attribute Value

Octet string

+ Format:

Class Id (2 bytes)	COSEM Object (6 bytes)	COSEM Object (2 bytes)

+ Ex:

000F0000280000FF02

⇔ Class 15, OBIS code {0,0,40,0,0,255}, attribute 2

EventNotificationRequest ::= **SEQUENCE**
{
time **OCTET STRING OPTIONAL**,
cosem-attribute-descriptor Cosem-Attribute-Descriptor,
attribute-value Data
}

+ Note: ASN Id

EVENT_NOTIFY_REQUEST = 0xC2

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Event notification

- There are 3 cases to send out the APDU

Mode		NDM				NRM		
command		SNRM	DISC	UI	UI(Empty)	I	RR	DISC
response	accept	UA	DM	UA	UI	I	RR	UA
	reject						FRMR	
	Event				UI	UI	UI	

Command for Event Notification	UI frame is sent out before last frame

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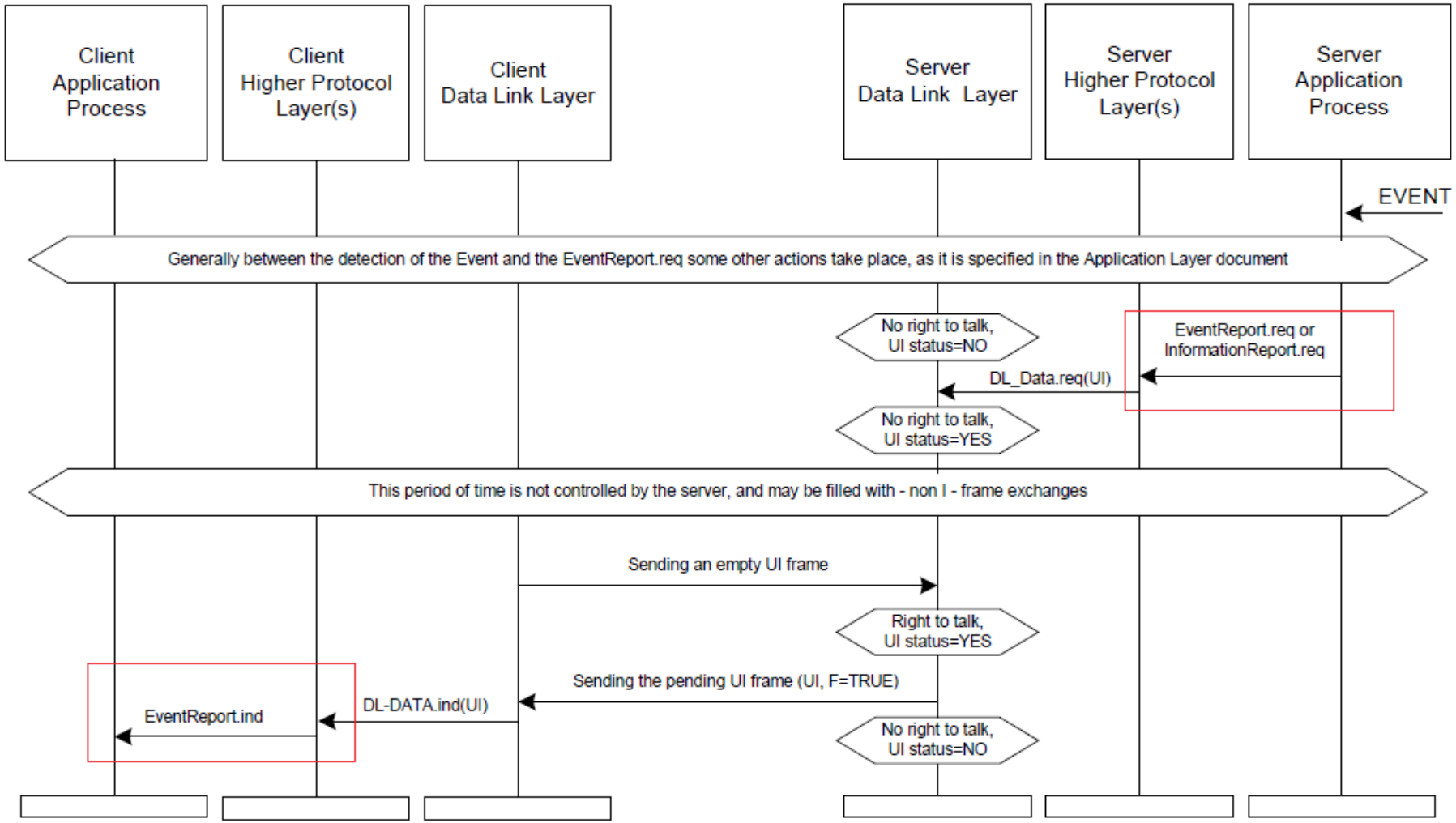
Event notification

Mode		NDM				NRM		
command		SNRM	DISC	UI	UI(Empty)		RR	DISC
response	accept	UA	DM	UA	UI		RR	UA
	reject						FRMR	
	Event				UI	UI	UI	



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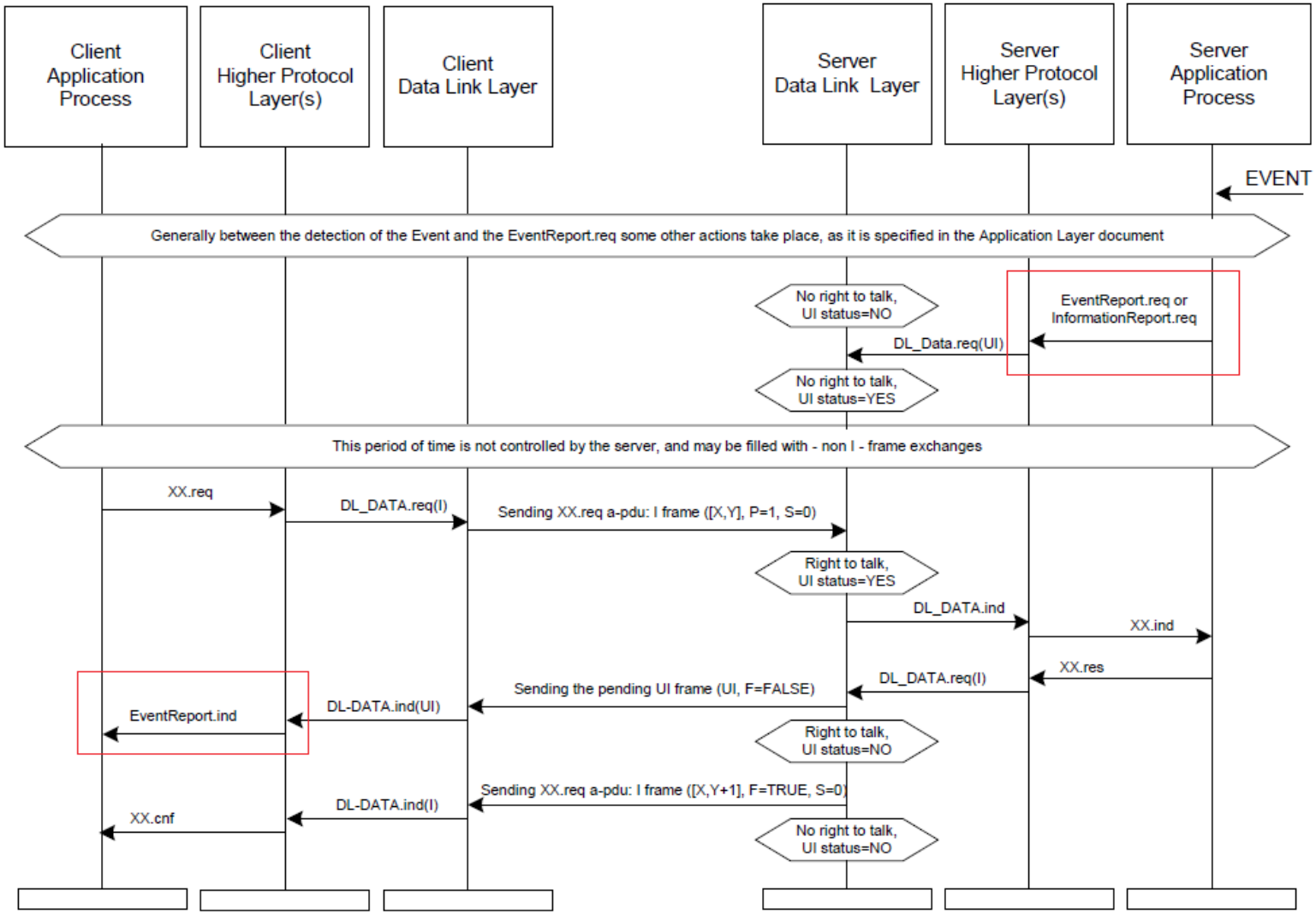
Event notification

Mode		NDM				NRM		
command		SNRM	DISC	UI	UI(Empty)	I	RR	DISC
response	accept	UA	DM	UA	UI	I	RR	UA
	reject						FRMR	
	Event				UI	UI	UI	



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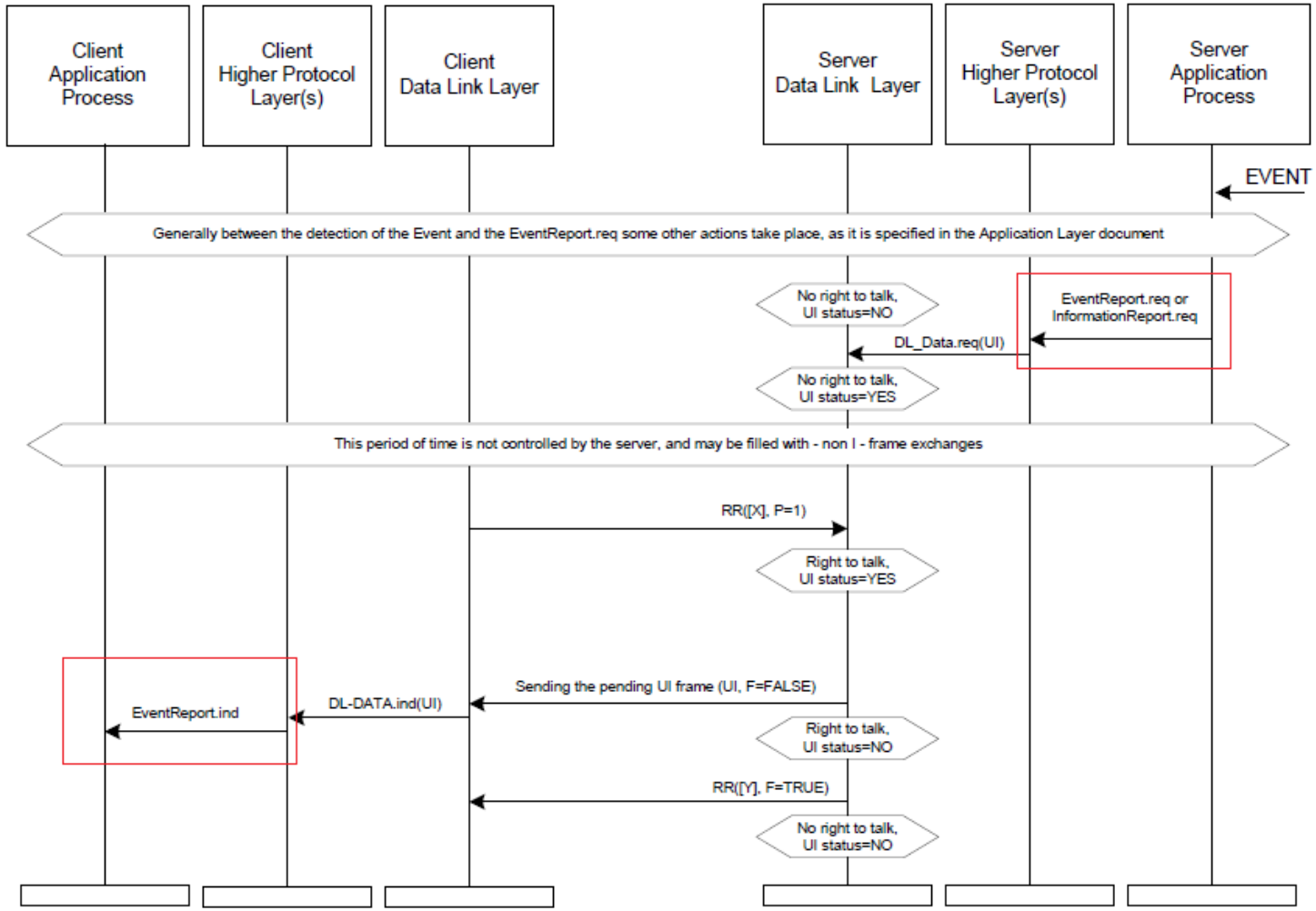
Event notification

Mode		NDM				NRM		
command		SNRM	DISC	UI	UI(Empty)	I	RR	DISC
response	accept	UA	DM	UA	UI	I	RR	UA
	reject						FRMR	
	Event				UI	UI	UI	



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Implementation

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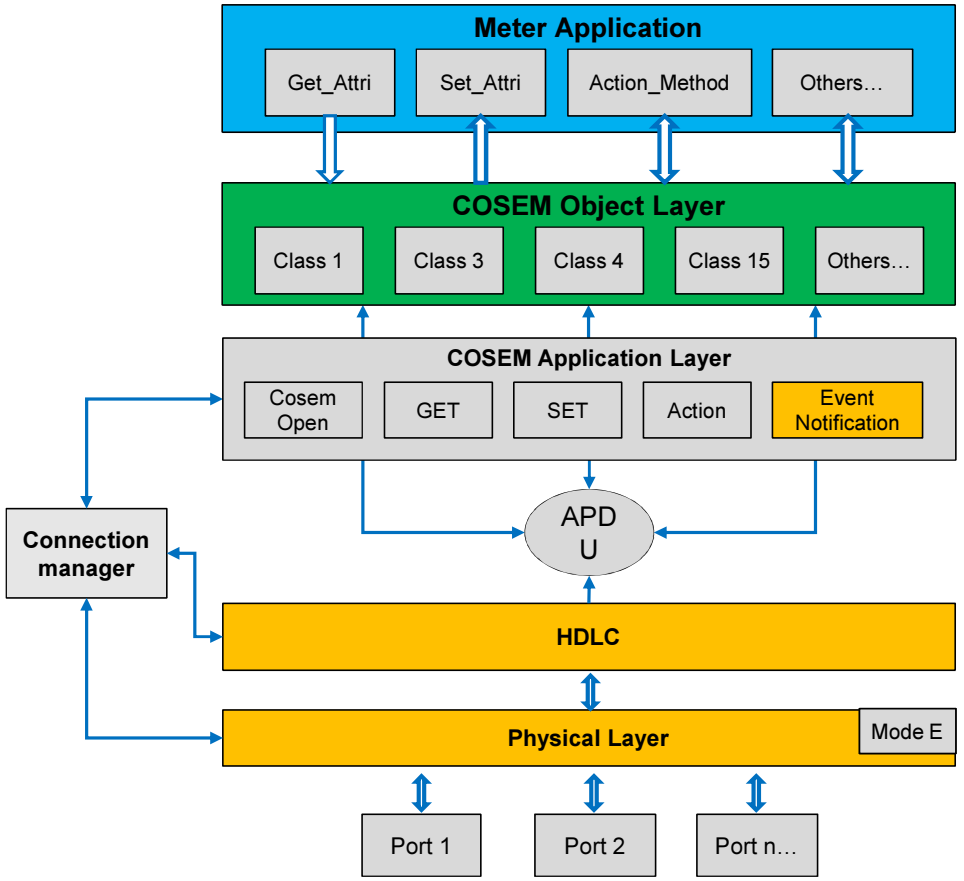
Implementation-encoding the APDU

```
//HDLC layer,
DLMSResponseReply ()
{
…
switch(info->HDLC_Frame.HDLC_Ctrl.Type){
/* In NDM */
case FRAME_UI:
  if (DataLinkUIRecieved(&info->HDLC_Frame)== SUCCESS) {
    Event_sent = DataLinkEventNotify(&info->HDLC_Frame) // (F=true);
    if(! Event_sent)
      DataLinkConnectionRespond(&info->HDLC_Frame);
                }

/* In NRM only */
…
case FRAME_I:
  if (info->Client_Status == CLIENT_POLL){
    if (DataLinkInfoRecieved(&info->HDLC_Frame)== SUCCESS){
      DataLinkEventNotify(&info->HDLC_Frame) // (F=false);
      DataLinkInfoResponse(&info->HDLC_Frame);
                }
…
case FRAME_RR:
  if (info->Client_Status == CLIENT_POLL){
   if (DataLinkRRRecieved(&info->HDLC_Frame)== SUCCESS){
     DataLinkEventNotify(&info->HDLC_Frame) // (F=false);
     DataLinkRRRespond(&info->HDLC_Frame);
     info->HDLC_Frame.HDLC_Ctrl.Type = FRAME_INVALID;
     }
…}
```



Mode		NDM				NRM		
command		SNRM	DISC	UI	UI(Empty)	I	RR	DISC
response	accept	UA	DM	UA	UI	I	RR	UA
	reject						FRMR	
	Event				UI	UI	UI	

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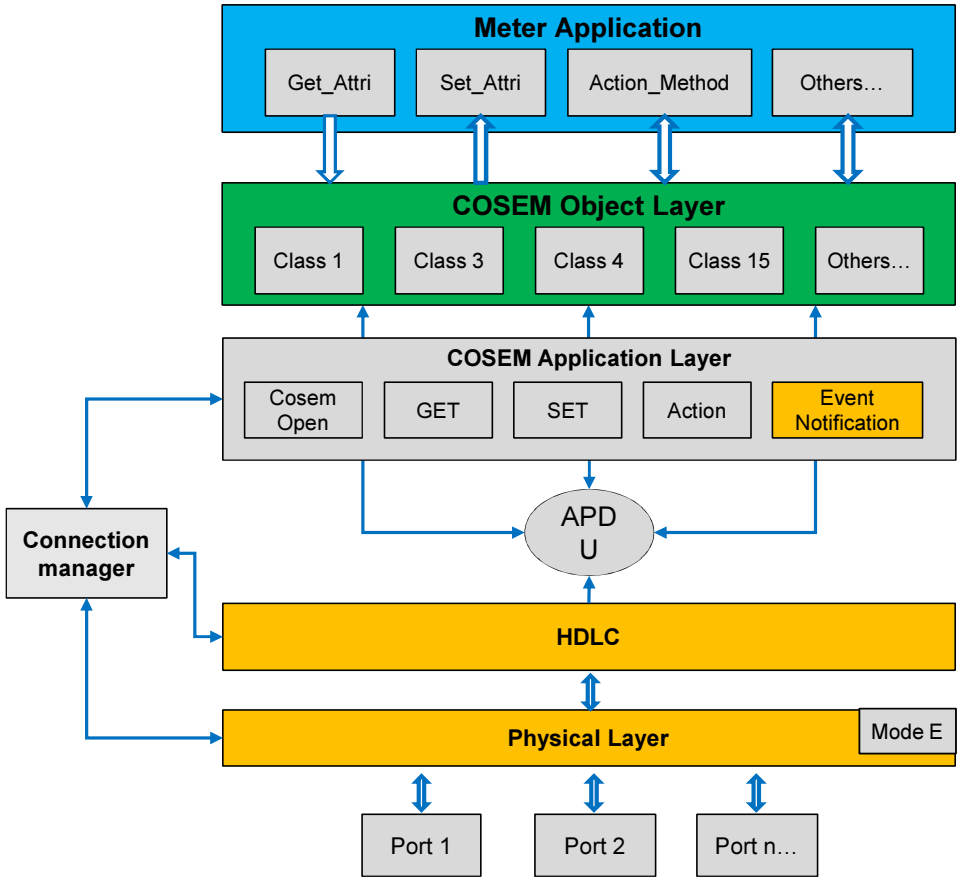
Implementation-encoding the APDU

```
//HDLC layer,
char DataLinkEventNotify(st_HDLC_FrameType3 *Frame) {
Event_sent = EventNotificationRequest ();
…
PhysicalSend(info->DATALINK_Buffer.TxStartPosition, Length);
return Event_sent; // has event or not ?
}

//Application layer
char EventNotificationRequest ()
{
        // Check event_flag1, event_flag2,.. turn on or not ?
        // Find the OBIS code from event ID
        EventNotificationRequest(OBIS, time_ptr);
}
// Object layer
char R_OBIS_EventNotification (char *OBIS, char *time_ptr)
{
        //Initial COSEM Attribute descriptor
        Cosem_Attr_Desc.Class_ID = 1;                    //Data class
        Cosem_Attr_Desc.Instance_ID[0] = OBIS[0];
        Cosem_Attr_Desc.Instance_ID[1] = OBIS[1];
        Cosem_Attr_Desc.Instance_ID[2] = OBIS[2];
        Cosem_Attr_Desc.Instance_ID[3] = OBIS[3];
        Cosem_Attr_Desc.Instance_ID[4] = OBIS[4];
        Cosem_Attr_Desc.Instance_ID[5] = OBIS[5];
        Cosem_Attr_Desc.Attr_ID = 2;
        //Get attribute value
        //Time encoding
        //Attribute value encoding
        OBIS_Func();
        EncodeEventNotification();
}
```




```
//Meter Application
void R_OBIS_Event_Report(Unsigned16 event_id)
{
// check event_flag to turn on event_flag1, event_flag2,…
// Set value as event_id
}
```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Appendix

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Event code objects

No.	Parameter	OBIS Code	Interface class
1	Voltage related events	0.b.96.11.0.255	Data (class id = 1)
2	Current related events	0.b.96.11.1.255	Data (class id = 1)
3	Power failure related events	0.b.96.11.2.255	Data (class id = 1)
4	Transaction related events	0.b.96.11.3.255	Data (class id = 1)
5	Other events	0.b.96.11.4.255	Data (class id = 1)
6	Non-rollover events	0.b.96.11.5.255	Data (class id = 1)
7	Control events for connect /disconnect	0.b.96.11.6.255	Data (class id = 1)

No.	EVENT ID	Descriptions
1	1	R-Phase – VT link Missing (Missing Potential) – Occurrence
2	2	R-Phase – VT link Missing (Missing Potential) – Restoration
3	3	Y-Phase – VT link Missing (Missing Potential) – Occurrence
4	4	Y-Phase – VT link Missing (Missing Potential) – Restoration
5	5	B-Phase – VT link Missing (Missing Potential) – Occurrence
6	6	B-Phase – VT link Missing (Missing Potential) – Restoration
7	7	Over Voltage in any Phase - Occurrence
8	8	Over Voltage in any Phase - Restoration
9	9	Low Voltage in any Phase - Occurrence
10	10	Low Voltage in any Phase - Restoration
11	11	Voltage Unbalance - Occurrence
12	12	Voltage Unbalance - Restoration

No.	EVENT ID	Descriptions
1	51	Phase – R CT reverse – Occurrence
2	52	Phase – R CT reverse – Restoration
3	53	Phase – Y CT reverse – Occurrence
4	54	Phase – Y CT reverse – Restoration
5	55	Phase – B CT reverse – Occurrence
6	56	Phase – B CT reverse – Restoration
7	57	Phase – R CT open – Occurrence
8	58	Phase – R CT open – Restoration
9	59	Phase – Y CT open – Occurrence
10	60	Phase – Y CT open – Restoration
11	61	Phase – B CT open – Occurrence
12	62	Phase – B CT open – Restoration
13	63	Current Unbalance - Occurrence
14	64	Current Unbalance - Restoration
15	65	CT Bypass – Occurrence
16	66	CT Bypass – Restoration
17	67	Over Current in any Phase – Occurrence
18	68	Over Current in any Phase – Restoration

No.	EVENT ID	Descriptions
1	101	Power failure (3 phases) – Occurrence
2	102	Power failure (3 phases) – Restoration

The value attribute (attr-2) of this object stores identifier corresponding to most recent event occurred in the meter.

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Event code objects

No.	Parameter	OBIS Code	Interface class
1	Voltage related events	0.b.96.11.0.255	Data (class id = 1)
2	Current related events	0.b.96.11.1.255	Data (class id = 1)
3	Power failure related events	0.b.96.11.2.255	Data (class id = 1)
4	Transaction related events	0.b.96.11.3.255	Data (class id = 1)
5	Other events	0.b.96.11.4.255	Data (class id = 1)
6	Non-rollover events	0.b.96.11.5.255	Data (class id = 1)
7	Control events for connect /disconnect	0.b.96.11.6.255	Data (class id = 1)

No.	EVENT ID	Descriptions
1	151	Real time clock, date and time
2	152	Demand integration period
3	153	Profile capture period
4	154	Single Action Schedule for billing dates
5	155	Activity Calendar for time zone

No.	EVENT ID	Descriptions
1	201	Influence of permanent magnet or AC/ DC electromagnet - Occurrence
2	202	Influence of permanent magnet or AC/ DC electromagnet - Restoration
3	203	Neutral Disturbance - HF & DC - Occurrence
4	204	Neutral Disturbance - HF & DC - Restoration
5	205	Very Low PF - Occurrence
6	206	Very Low PF - Restoration

No.	EVENT ID	Descriptions
1	251	Meter Cover Opening – Occurrence

No.	EVENT ID	Descriptions
1	301	Meter load disconnected
2	302	Meter load connected

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Event log objects

No.	Parameter	OBIS Code	Interface class
1	Voltage related events	0.b.99.98.0.255	Profile Generic (class id = 7)
2	Current related events	0.b.99.98.1.255	Profile Generic (class id = 7)
3	Power failure related events	0.b.99.98.2.255	Profile Generic (class id = 7)
4	Transaction related events	0.b.99.98.3.255	Profile Generic (class id = 7)
5	Other events	0.b.99.98.4.255	Profile Generic (class id = 7)
6	Non-rollover events	0.b.99.98.5.255	Profile Generic (class id = 7)
7	Control events for connect /disconnect	0.b.99.98.6.255	Profile Generic (class id = 7)

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