IEEE P802.15
Wireless Personal Area Networks

Project	IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)
Title	**Changes for the removal of using Imm-ACK frames as confirmation of Request commands**
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Re:	[]
Abstract	[This document contains a list or proposed changes to IEEE Std 802.15.3.]
Purpose	[The purpose of this document is to propose changes to IEEE Std 802.15.3 to improve compatibility, performance and clarity in the standard.]
Notice	This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.
Release	The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.

1. Introduction

At the 802.15.3b meeting in Orlando, March 2004, document 04/138 proposed a change to IEEE 802.15.3. The change was to change the functionality described in the standard such that Imm-ACK frames were not used as part of management command frame exchanges. The reason for this change is because in some cases Imm-ACK frames were used as an indication that a command frame was both received by the destination and processed by the destination, when an Imm-ACK frame can only ever mean that the command frame was received and not that the command frame was processed.

1.1 Example message exchange

The MSC in Figure 1 is a representation of the type of management command frame exchange that this document addresses.
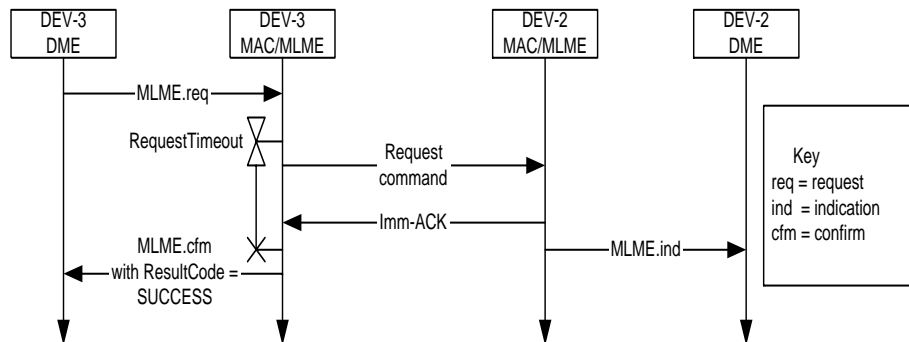
Figure 1— A representation of the frame exchange sequence address by this document

1.2 Addressing the issue

Discussion of this issue at the March 2004 meeting revealed that there are two separate situations in which this problem frame exchange sequence was used.

The first was a situation where acknowledgement that the command frame transmitted over the air was both received and processed was needed. For these scenarios, the solution is to replace the Imm-ACK frame with an explicit command frame.

The MSC in Figure 2 is a representation of how the MSC in Figure 1 would need to change in this case.
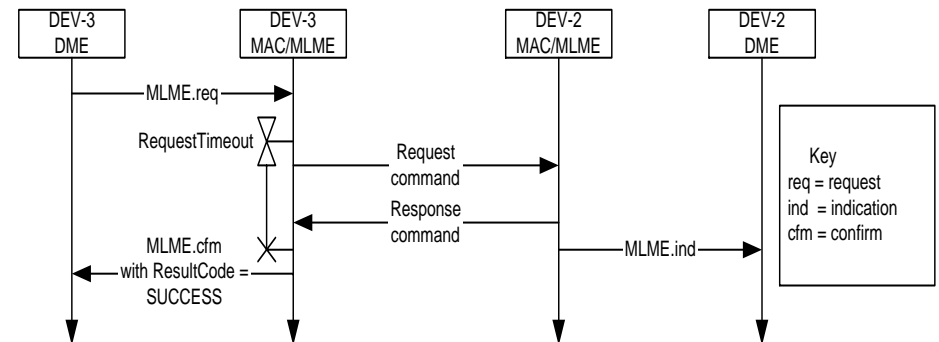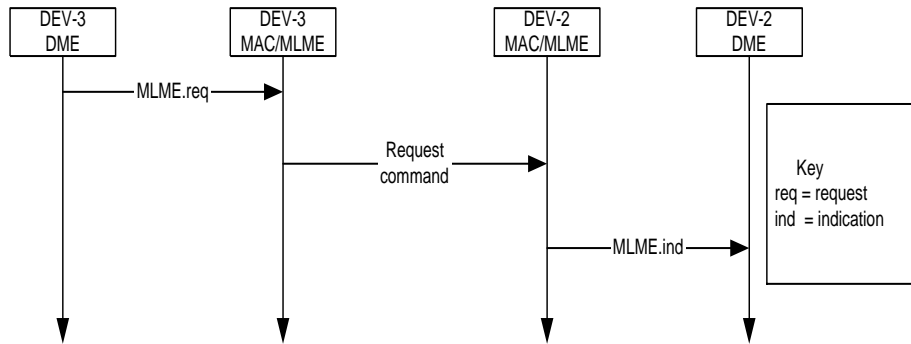
Figure 2— Change to MSC if a confirmation is needed

The second situation identified was one where acknowledgement that the command frame was received and processes was not needed. These situations were given the name "fire and forget" scenarios. For these scenarios, the solution is to modify the MSC such that there is no request timeout timer or acknowledgement frame.

The MSC in Figure 3 is a represenation of how the MSC in Figure 1 would change in this case.

```
┌─────────┐      ┌──────────┐      ┌──────────┐      ┌─────────┐
│  DEV-3  │      │  DEV-3   │      │  DEV-2   │      │  DEV-2  │
│   DME   │      │ MAC/MLME │      │ MAC/MLME │      │   DME   │
└─────────┘      └──────────┘      └──────────┘      └─────────┘
```

MLME.req

Request command

MLME.ind

Key
req = request
ind = indication

Figure 3—Change to MSC if a confirmation is not needed

Note that in Figure 3, no MLME.cnf primitive is required.

2. Clause 8 MSC changes

2.1 Section purpose

This sections shows through comparison how the some of the MSCs in Clause 8 of IEEE 802.15.3 would need to be modified in order to support the change suggested by this document.

The Figure numbers in this section represent Figure numbers from IEEE 802.15.3.

On each of the following pages in this section a version of an MSC as currently defined in IEEE 802.15.3 is shown of the left side of the page. The right side of each page shows the new suggested MSC, along with a list of the changes made to the original MSC to support the changes suggested by this document.

2.2 Strategies/Guidelines used

The following are the strategies and guidelines that were followed in the creation of the new MSCs presented in this section. This was done in an effort to have consistencies between all the frame exchanges sequences represented by the MSCs.

- Keeping in mind that beacon generation and transmission is an autonomous process that occurs independently from command frame exchanges, Request commands are acknowledged with Response commands when possible, increasing response time and timely completion of the overall message exchange sequence.

- A DEV initiating a Request command that requires a confirmation that the request was both received and processed is given a Response command as this confirmation. Other DEVs in the piconet are typically notified of system changes that result from the original request via the transmission of a Beacon frame by the PNC at some point in the future.

- The "Build beacon" task shown on the PNC MAC/MLME instance represents that the time to create and transmit a beacon has arrived in the PNC. This should be considered to occur "sometime in the future" with respect to previous information shown on the MSC.

- Scenarios identified as "fire and forget" can not be confirmed, so no MLME.cfm primitive should be generated as part of the message exchange sequence.

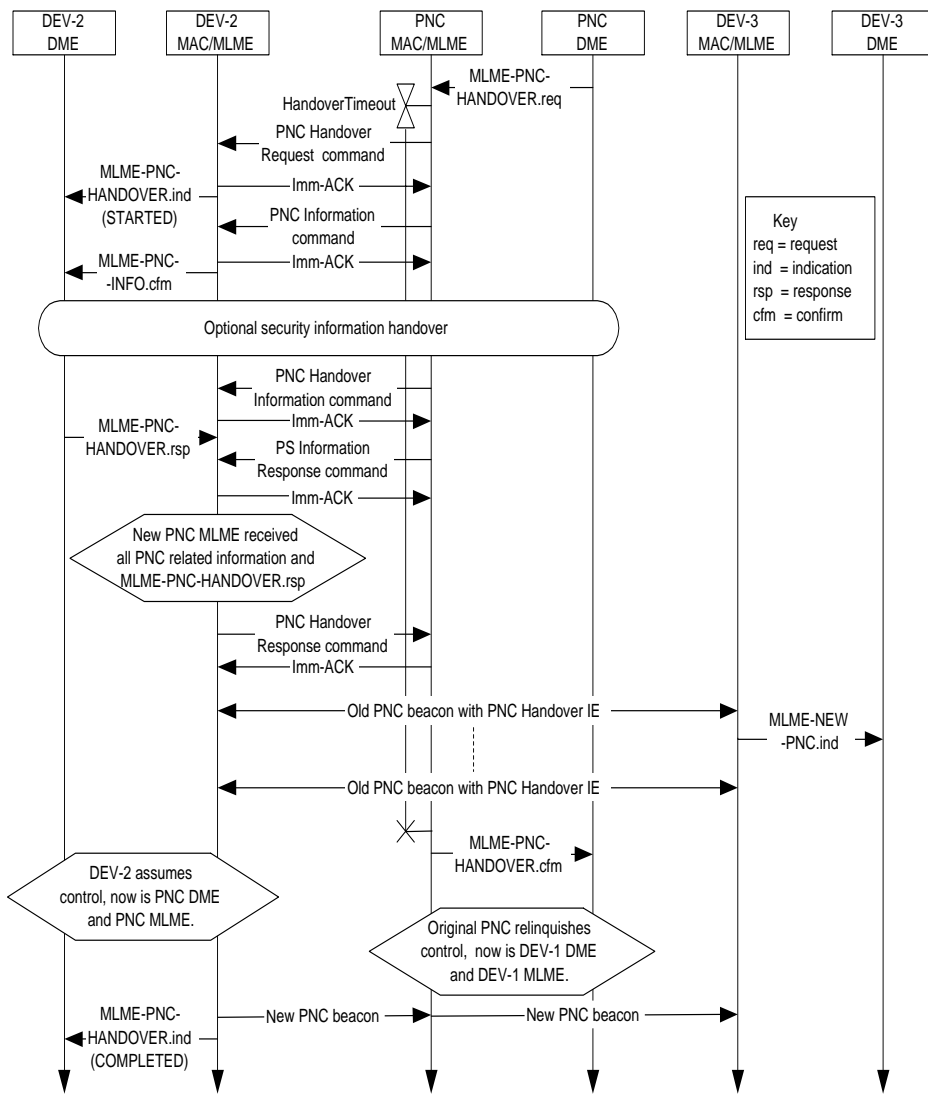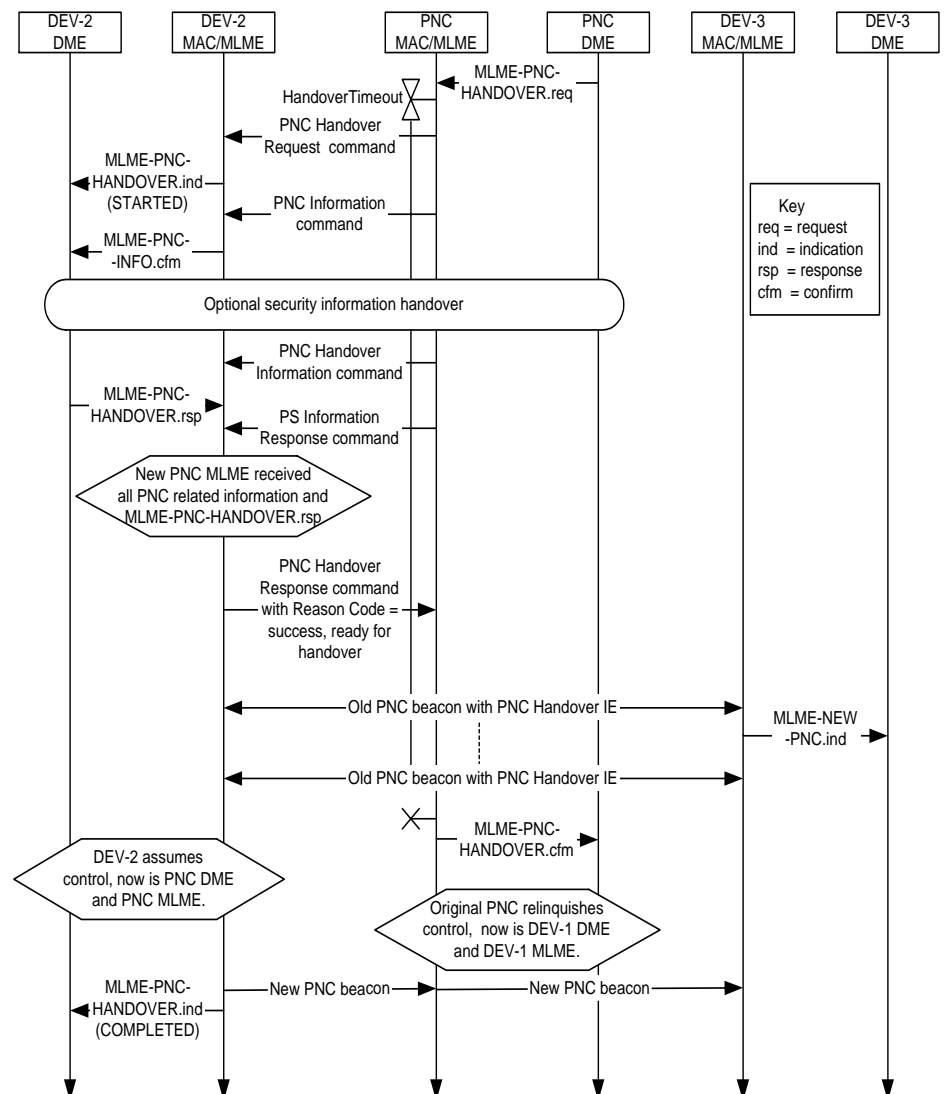### 2.3 The MSCs

Figure 94 - Current

Figure 94 - New

- Imm-ACKs removed.
- Reascon Code of "success, ready for handover" added to the PNC Handover Response command.
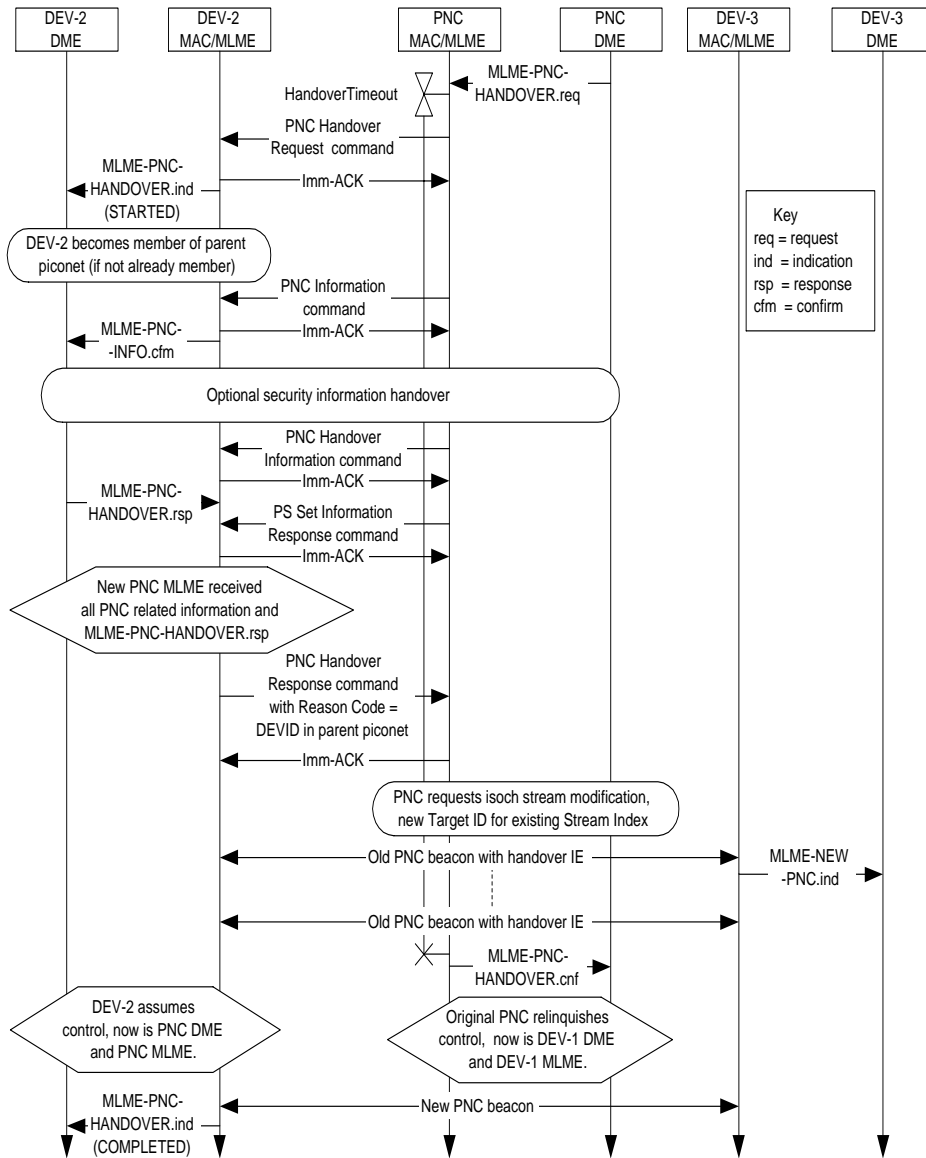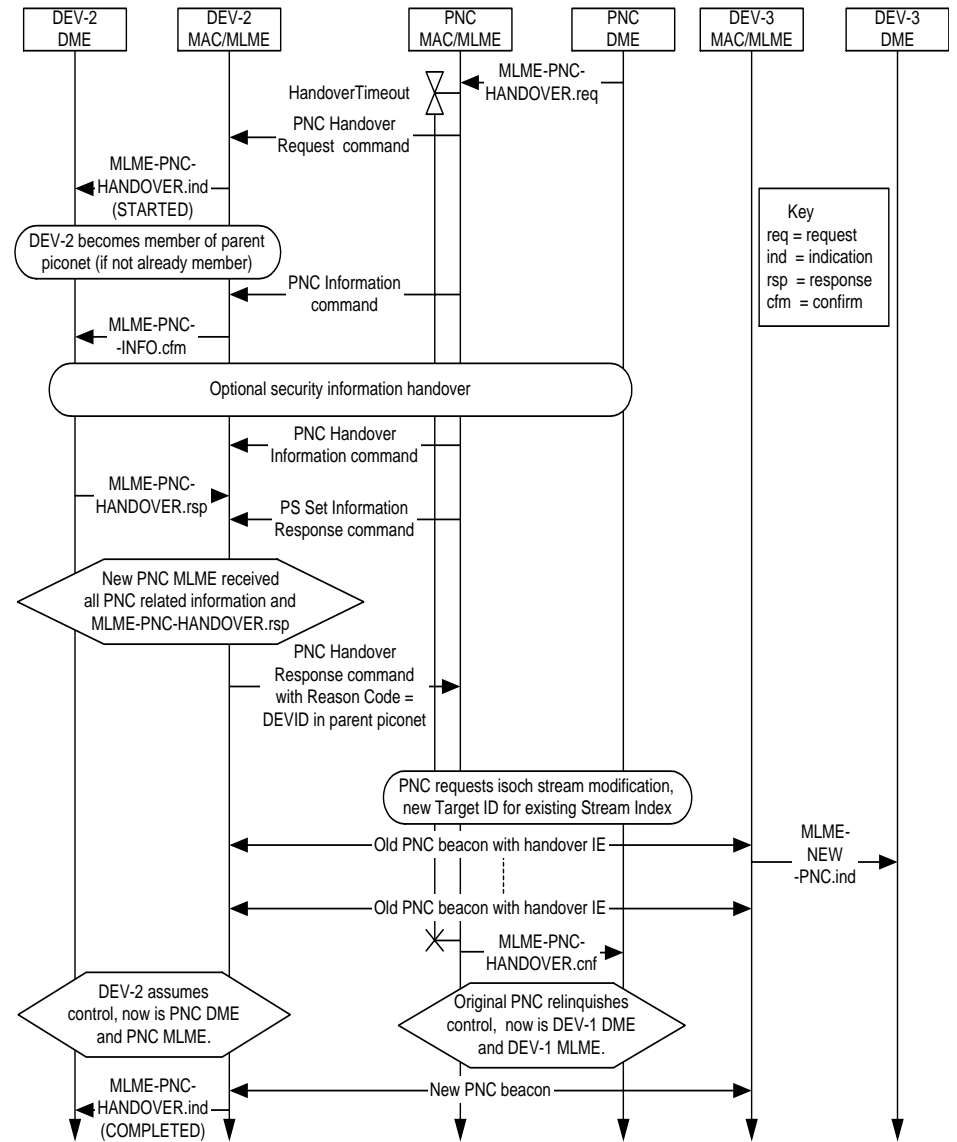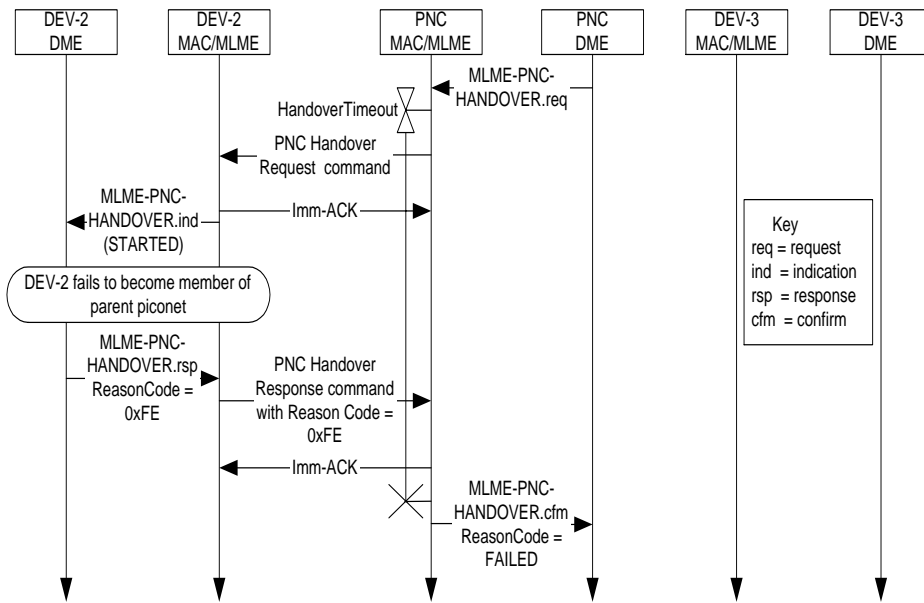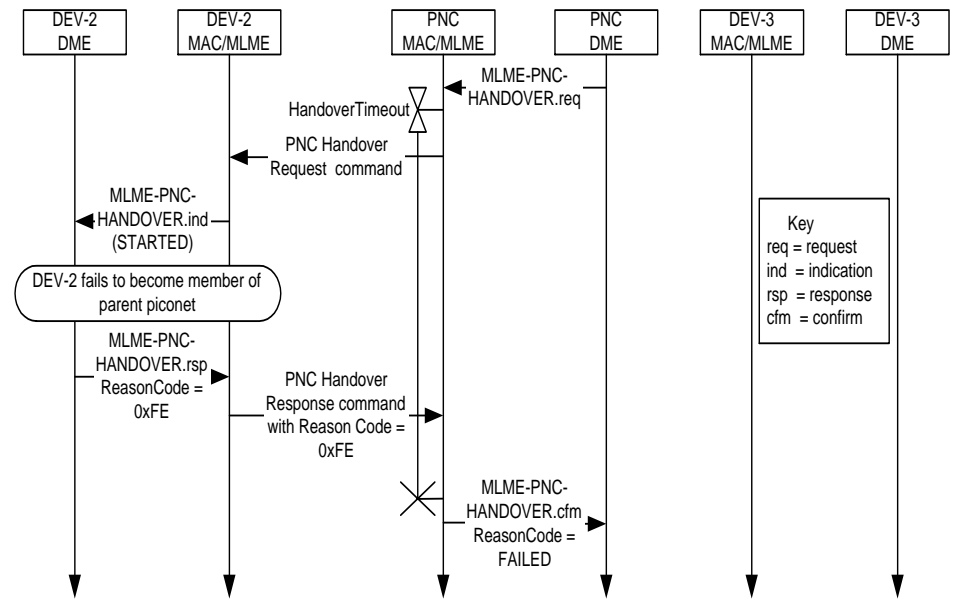
Figure 95 - Current

Figure 95 - New

•   Imm-ACKs removed.

Figure 96 - Current

Figure 96 - New

- Imm-ACKs removed.

Figure 97 - Current
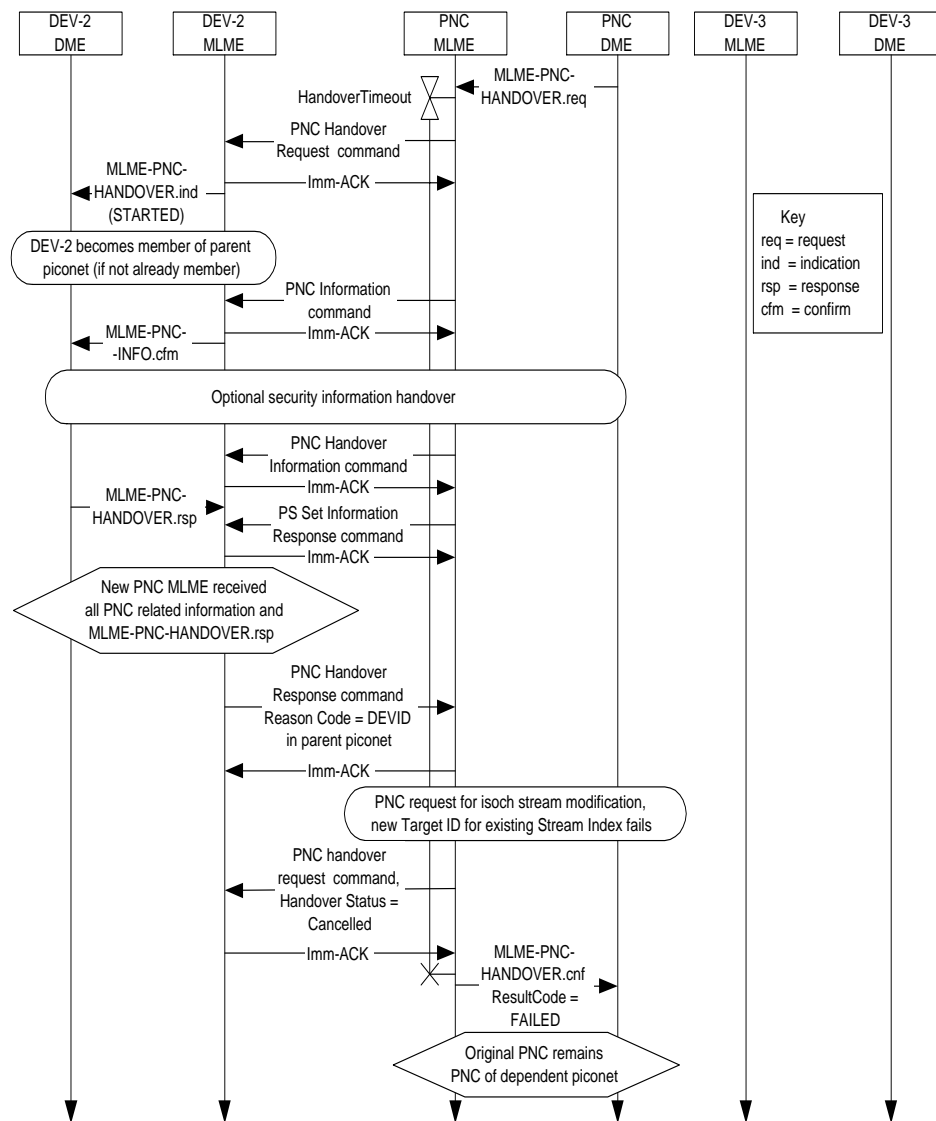
DEV-2 DME | DEV-2 MLME | PNC MLME | PNC DME | DEV-3 MLME | DEV-3 DME

MLME-PNC-HANDOVER.req

HandoverTimeout

PNC Handover Request command

MLME-PNC-HANDOVER.ind (STARTED)

Imm-ACK

DEV-2 becomes member of parent piconet (if not already member)

Key
req = request
ind = indication
rsp = response
cfm = confirm

PNC Information command

MLME-PNC--INFO.cfm

Imm-ACK

Optional security information handover

PNC Handover Information command

Imm-ACK

MLME-PNC-HANDOVER.rsp

PS Set Information Response command

Imm-ACK

New PNC MLME received all PNC related information and MLME-PNC-HANDOVER.rsp

PNC Handover Response command Reason Code = DEVID in parent piconet

Imm-ACK

PNC request for isoch stream modification, new Target ID for existing Stream Index fails

PNC handover request command, Handover Status = Cancelled

Imm-ACK

MLME-PNC-HANDOVER.cnf ResultCode = FAILED

Original PNC remains PNC of dependent piconet

Figure 97 - New

DEV-2 DME | DEV-2 MLME | PNC MLME | PNC DME | DEV-3 MLME | DEV-3 DME

MLME-PNC-HANDOVER.req

HandoverTimeout

PNC Handover Request command

MLME-PNC-HANDOVER.ind Handover Status = Started

DEV-2 becomes member of parent piconet (if not already member)

Key
req = request
ind = indication
rsp = response
cfm = confirm

PNC Information command

MLME-PNC--INFO.cfm

Optional security information handover

PNC Handover Information command

MLME-PNC-HANDOVER.rsp

PS Set Information Response command

New PNC MLME received all PNC related information and MLME-PNC-HANDOVER.rsp

PNC Handover Response command Reason Code = DEVID in parent piconet

PNC request for isoch stream modification, new Target ID for existing Stream Index fails

MLME-PNC-HANDOVER.ind Handover Status = Cancelled

PNC handover request command, Handover Status = Cancelled

MLME-PNC-HANDOVER.rsp

PNC Handover Response command with Reason Code = success, handover cancelled

MLME-PNC-HANDOVER.cnf ResultCode = FAILED

Original PNC remains PNC of dependent piconet

- Imm-ACKs removed.
- Cancellation of handover acknowledged with a PNC Handover Response command with a Reason Code of "success, handover cancelled"
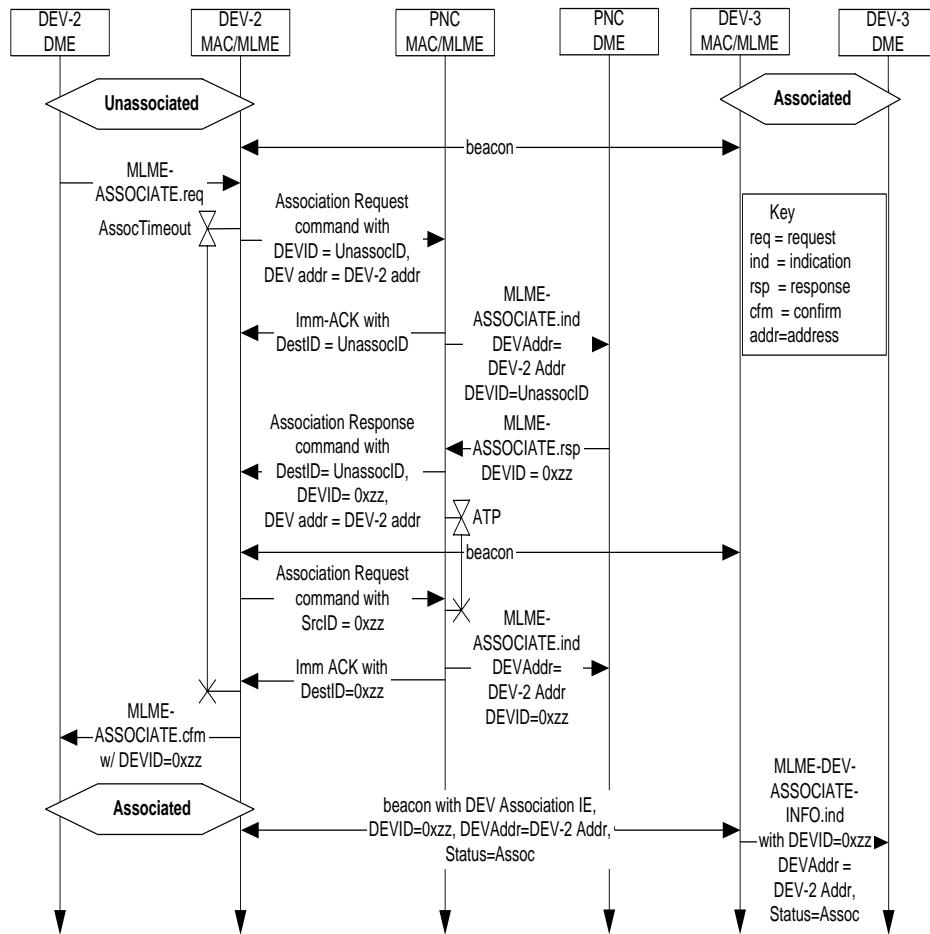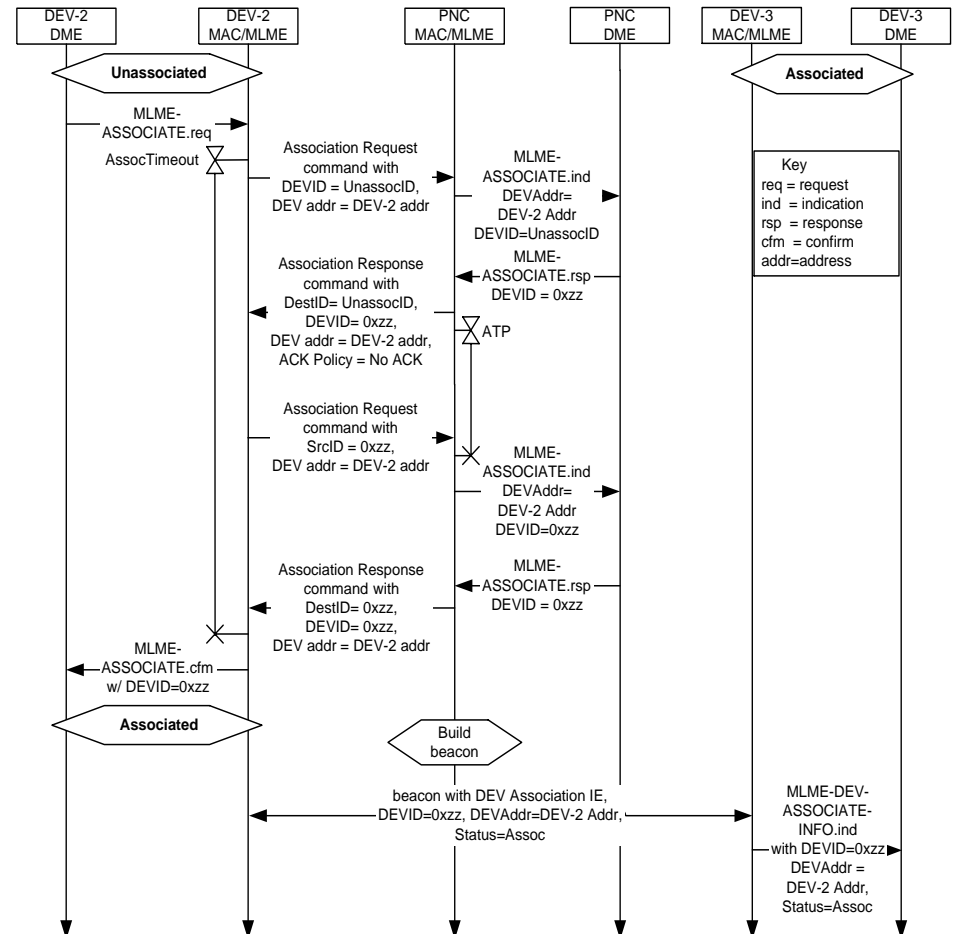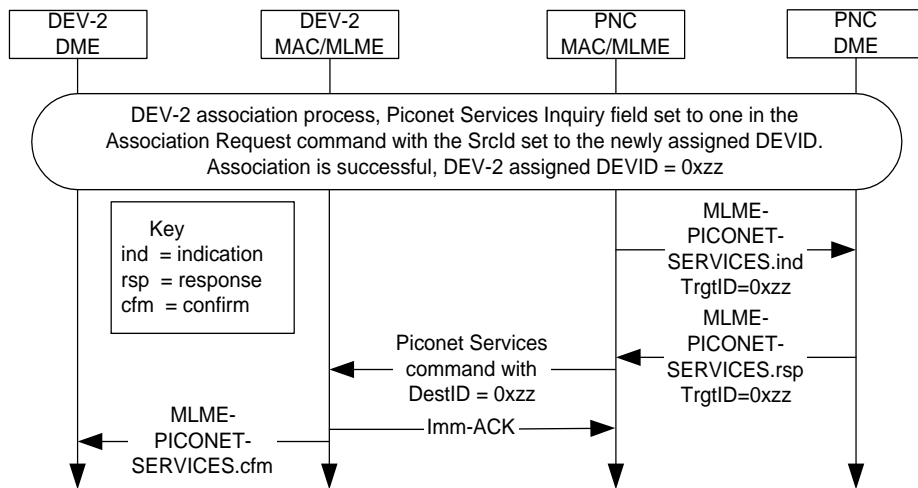
Figure 102 - Current

DEV-2 DME | **DEV-2 MAC/MLME** | **PNC MAC/MLME** | **PNC DME** | **DEV-3 MAC/MLME** | **DEV-3 DME**

Unassociated

Associated

beacon

MLME-ASSOCIATE.req

AssocTimeout

Association Request command with DEVID = UnassocID, DEV addr = DEV-2 addr

Key
req = request
ind = indication
rsp = response
cfm = confirm
addr=address

Imm-ACK with DestID = UnassocID

MLME-ASSOCIATE.ind DEVAddr= DEV-2 Addr DEVID=UnassocID

Association Response command with DestID= UnassocID, DEVID= 0xzz, DEV addr = DEV-2 addr

MLME-ASSOCIATE.rsp DEVID = 0xzz

ATP

beacon

Association Request command with SrcID = 0xzz

MLME-ASSOCIATE.ind DEVAddr= DEV-2 Addr DEVID=0xzz

Imm ACK with DestID=0xzz

MLME-ASSOCIATE.cfm w/ DEVID=0xzz

Associated

beacon with DEV Association IE, DEVID=0xzz, DEVAddr=DEV-2 Addr, Status=Assoc

MLME-DEV-ASSOCIATE-INFO.ind with DEVID=0xzz DEVAddr = DEV-2 Addr, Status=Assoc

Figure 102 - New

DEV-2 DME | **DEV-2 MAC/MLME** | **PNC MAC/MLME** | **PNC DME** | **DEV-3 MAC/MLME** | **DEV-3 DME**

Unassociated

Associated

MLME-ASSOCIATE.req

AssocTimeout

Association Request command with DEVID = UnassocID, DEV addr = DEV-2 addr

MLME-ASSOCIATE.ind DEVAddr= DEV-2 Addr DEVID=UnassocID

Key
req = request
ind = indication
rsp = response
cfm = confirm
addr=address

Association Response command with DestID= UnassocID, DEVID= 0xzz, DEV addr = DEV-2 addr, ACK Policy = No ACK

MLME-ASSOCIATE.rsp DEVID = 0xzz

ATP

Association Request command with SrcID = 0xzz, DEV addr = DEV-2 addr

MLME-ASSOCIATE.ind DEVAddr= DEV-2 Addr DEVID=0xzz

Association Response command with DestID= 0xzz, DEVID= 0xzz, DEV addr = DEV-2 addr

MLME-ASSOCIATE.rsp DEVID = 0xzz

MLME-ASSOCIATE.cfm w/ DEVID=0xzz

Associated

Build beacon

beacon with DEV Association IE, DEVID=0xzz, DEVAddr=DEV-2 Addr, Status=Assoc

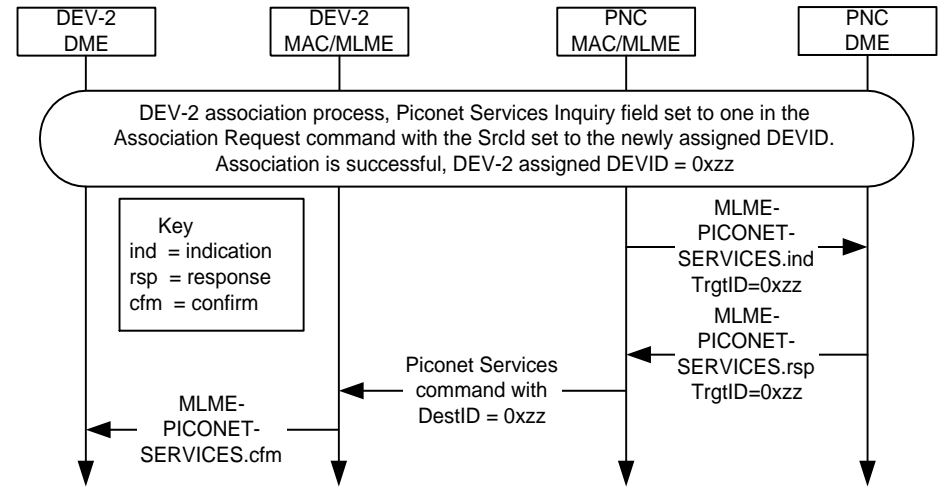MLME-DEV-ASSOCIATE-INFO.ind with DEVID=0xzz DEVAddr = DEV-2 Addr, Status=Assoc

- Imm-ACKs removed.
- ACK Policy for first Association Response command identified as "No ACK"
- Note: As long as standard states that the DestID of the Imm-ACK should equal the SrcID of the previously received frame, then Imm-ACKs do not need to be shown with the varying DestIDs on this MSC.
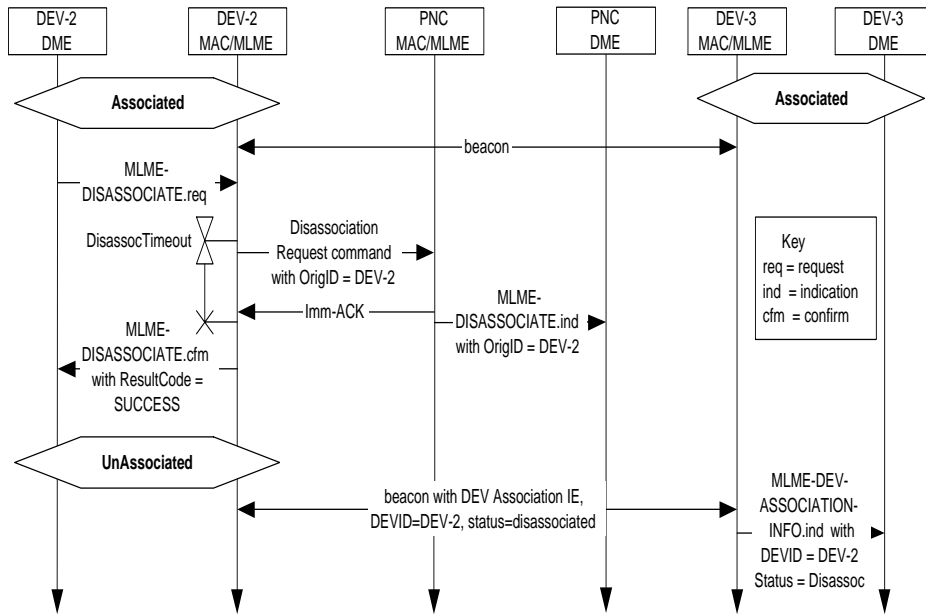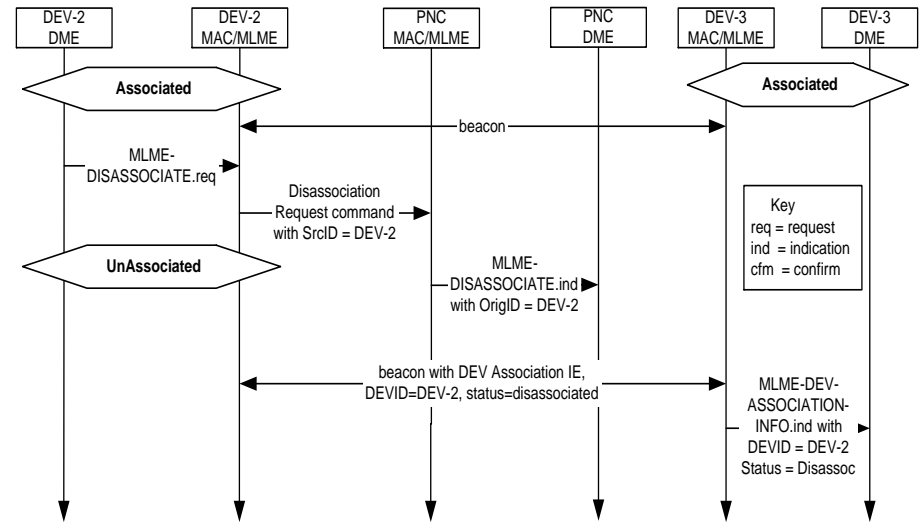
Figure 103 - Current

Figure 103 - New

DEV-2 DME | DEV-2 MAC/MLME | PNC MAC/MLME | PNC DME

DEV-2 association process, Piconet Services Inquiry field set to one in the Association Request command with the SrcId set to the newly assigned DEVID. Association is successful, DEV-2 assigned DEVID = 0xzz

Key
ind = indication
rsp = response
cfm = confirm

MLME-PICONET-SERVICES.ind
TrgtID=0xzz

MLME-PICONET-SERVICES.rsp
TrgtID=0xzz

Piconet Services command with DestID = 0xzz

Imm-ACK

MLME-PICONET-SERVICES.cfm

DEV-2 DME | DEV-2 MAC/MLME | PNC MAC/MLME | PNC DME

DEV-2 association process, Piconet Services Inquiry field set to one in the Association Request command with the SrcId set to the newly assigned DEVID. Association is successful, DEV-2 assigned DEVID = 0xzz

Key
ind = indication
rsp = response
cfm = confirm

MLME-PICONET-SERVICES.ind
TrgtID=0xzz

MLME-PICONET-SERVICES.rsp
TrgtID=0xzz

Piconet Services command with DestID = 0xzz

MLME-PICONET-SERVICES.cfm

- Imm-ACK removed.
- No timer was started on original, so assumed this should be a "fire and forget" scenario.

Figure 104 - Current

Figure 104 - New (Recommended)

- Timer and confirm removed (fire and forget scenario)

Figure 104 - New (Another Option)
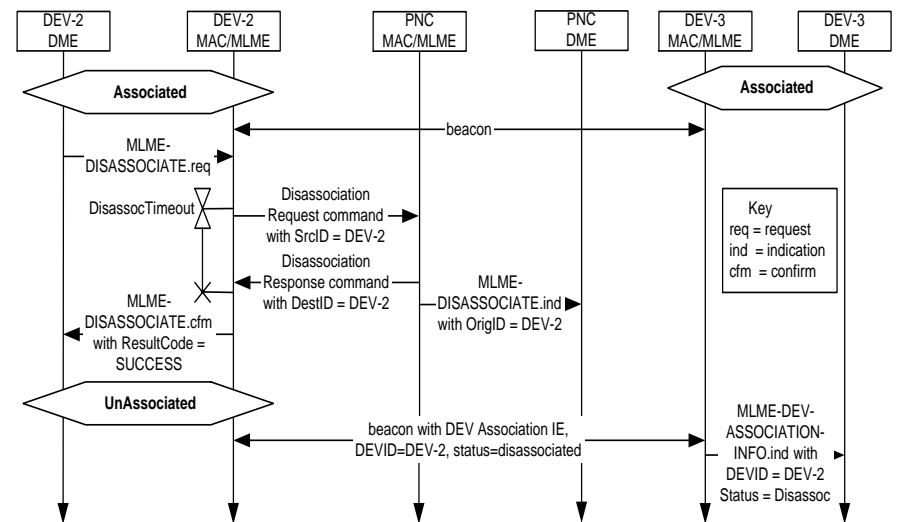
- Imm-ACK replaced with new Disassociation Response command.

Figure 105 - Current

| DEV-2 DME | DEV-2 MAC/MLME | PNC MAC/MLME | PNC DME | DEV-3 MAC/MLME | DEV-3 DME |

Associated

beacon

MLME-DISASSOCIATE.req with TrgtID = DEV-2

DisassocTimeout

Associated

Key
req = request
ind = indication

Disassociation Request command

MLME-DISASSOCIATE.ind

Imm-ACK

MLME-DISASSOCIATE.cfm with ResultCode = SUCCESS

UnAssociated

beacon with DEV Association IE, DEVID=DEV-2, status=disassociated

MLME-DEV-ASSOCIATION-INFO.ind with DEVID = DEV-2 Status = Disassoc

Figure 105 - New
‘

| DEV-2 DME | DEV-2 MAC/MLME | PNC MAC/MLME | PNC DME | DEV-3 MAC/MLME | DEV-3 DME |

Associated

beacon

MLME-DISASSOCIATE.req with TrgtID = DEV-2

Associated

Key
req = request
ind = indication

Disassociation Request command

MLME-DISASSOCIATE.ind

UnAssociated

beacon with DEV Association IE, DEVID=DEV-2, status=disassociated

MLME-DEV-ASSOCIATION-INFO.ind with DEVID = DEV-2 Status = Disassoc

- Imm-ACK removed.
- DisassocTimeout timer removed.
- Note: If the PNC disassociates a DEV, the DEV is disassociated if the DEV responds to the Disassociation Request command or not. Therefore, this scenario is assumed to be a "fire and forget" scenario.

Figure 114 - Current
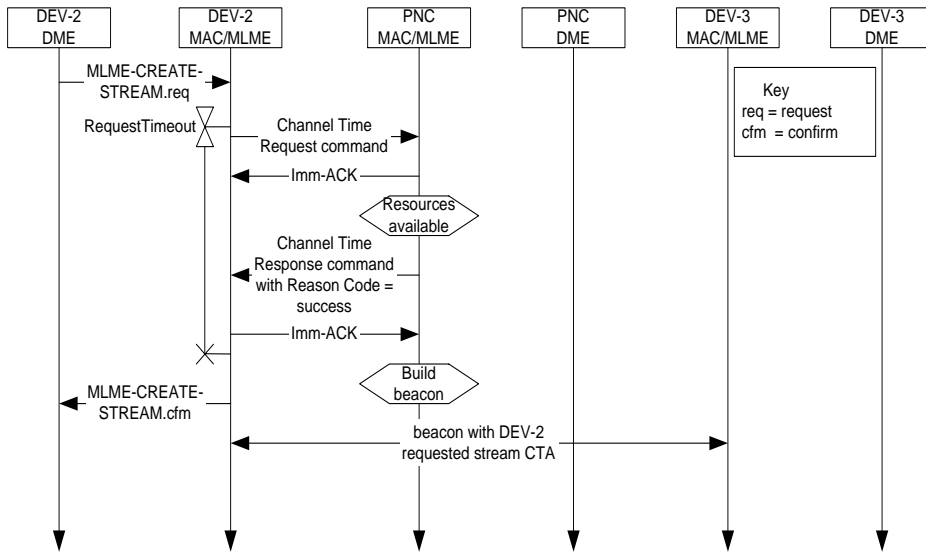
Figure 114 - New
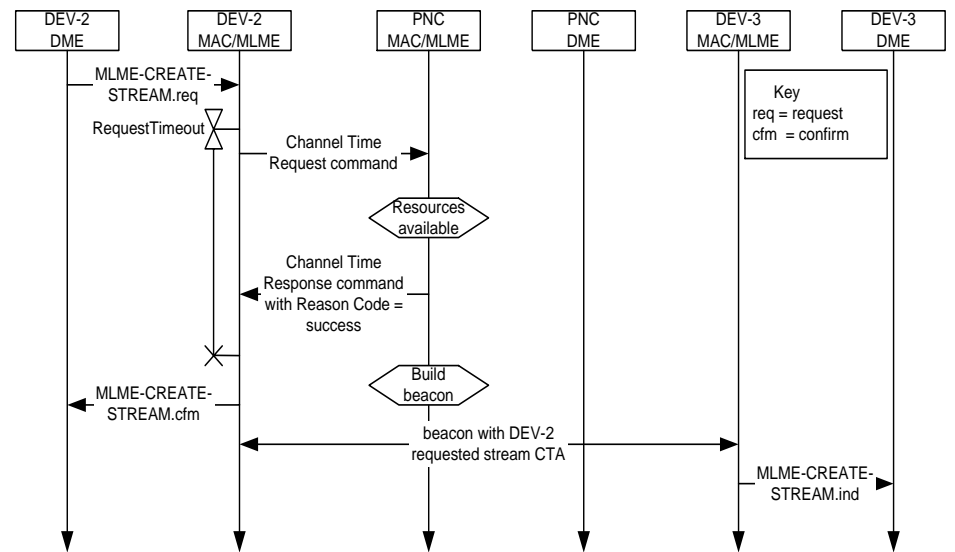
- Imm-ACKs removed.
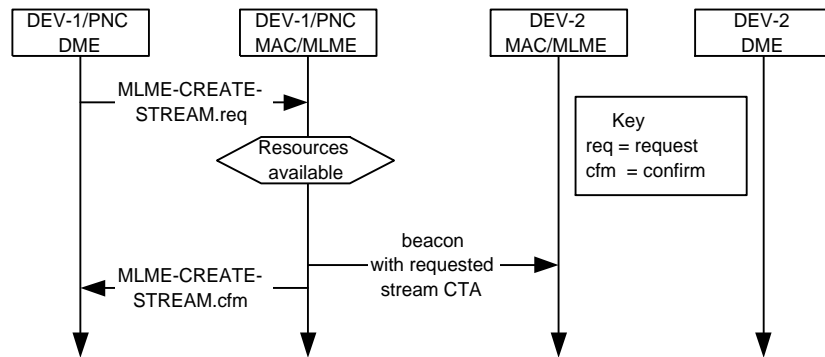- New MLME-CREATE-STREAM.indication added (Missing on original MSC)
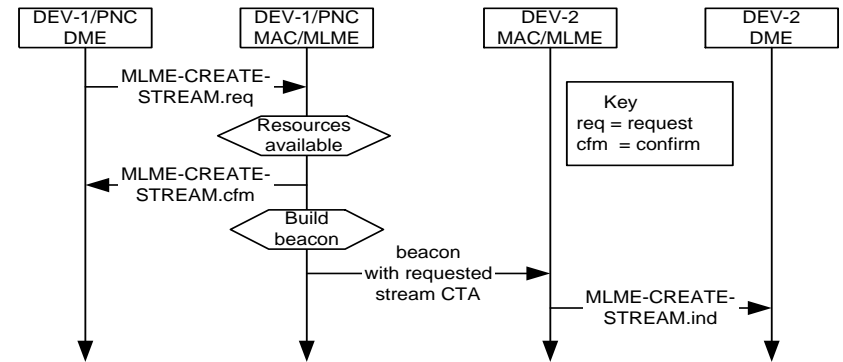
Figure 115 - Current

Figure 115 - New

DEV-2 DME | **DEV-2 MAC/MLME** | **PNC MAC/MLME** | **PNC DME** | **DEV-3 MAC/MLME** | **DEV-3 DME**

MLME-CREATE-STREAM.req

RequestTimeout

Channel Time Request command

Imm-ACK

Resources available

Channel Time Response command with Reason Code not equal to success

Imm-ACK

MLME-CREATE-STREAM.cfm

Key
req = request
cfm = confirm

DEV-2 DME | **DEV-2 MAC/MLME** | **PNC MAC/MLME** | **PNC DME** | **DEV-3 MAC/MLME** | **DEV-3 DME**

MLME-CREATE-STREAM.req

RequestTimeout

Channel Time Request command

Resources unavailable

Channel Time Response command with Reason Code not equal to success

MLME-CREATE-STREAM.cfm

Key
req = request
cfm = confirm

- Imm-ACKs removed.

Figure 116 - Current

Figure 116 - New

- MLME-CREATE-STREAM.cfm generated after PNC determines that it has resources available (Beacon generation occurs "sometime in the future").
- "Build beacon" task added to be consistent with other MSCs that generate beacons.
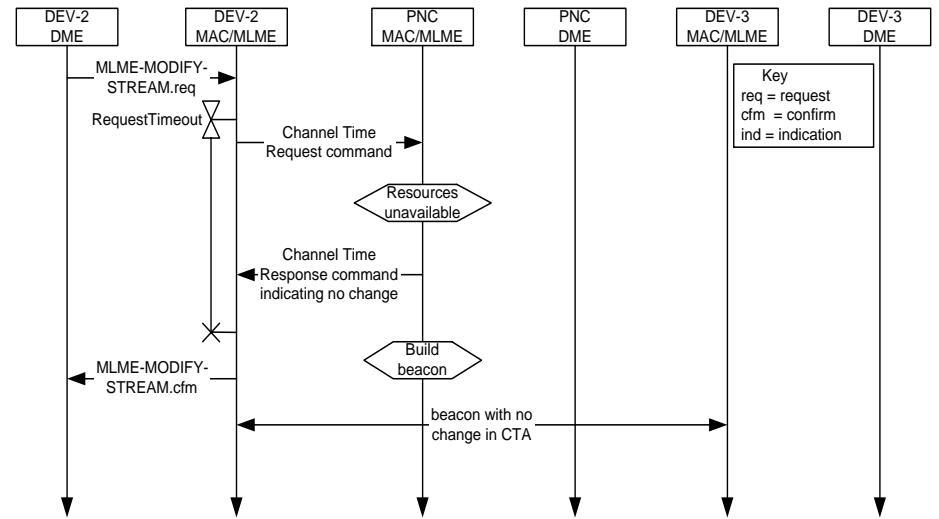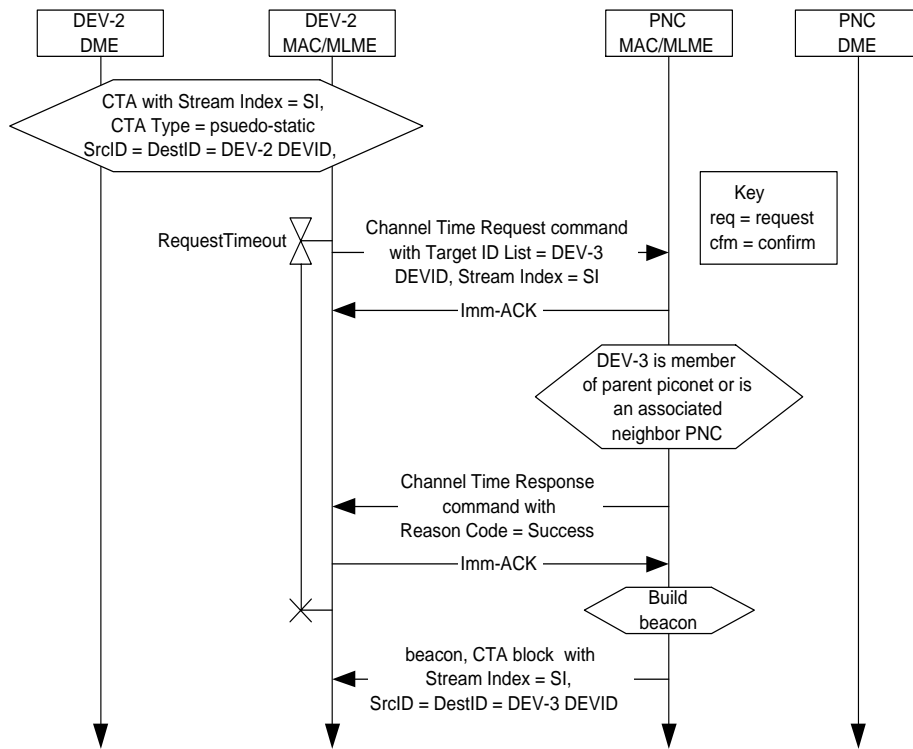- New MLME-CREATE-STREAM.indication added.

Figure 117 - Current
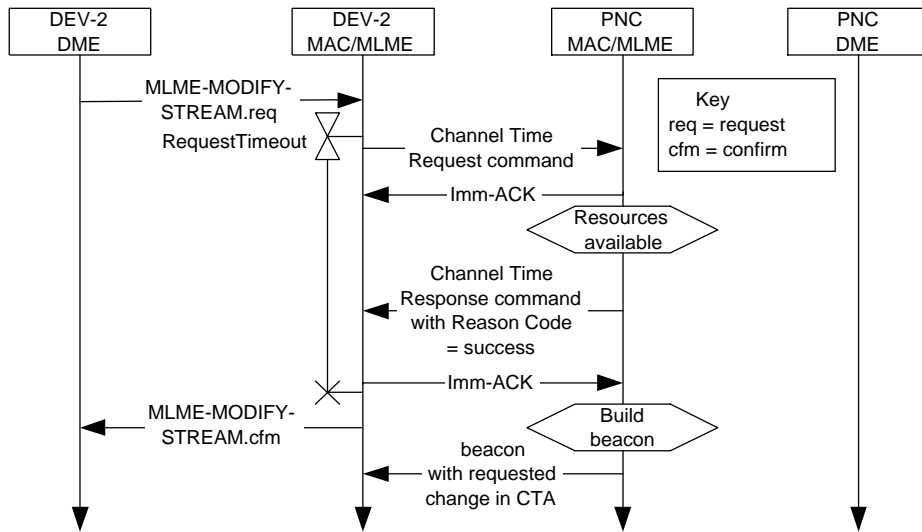
Figure 117 - New
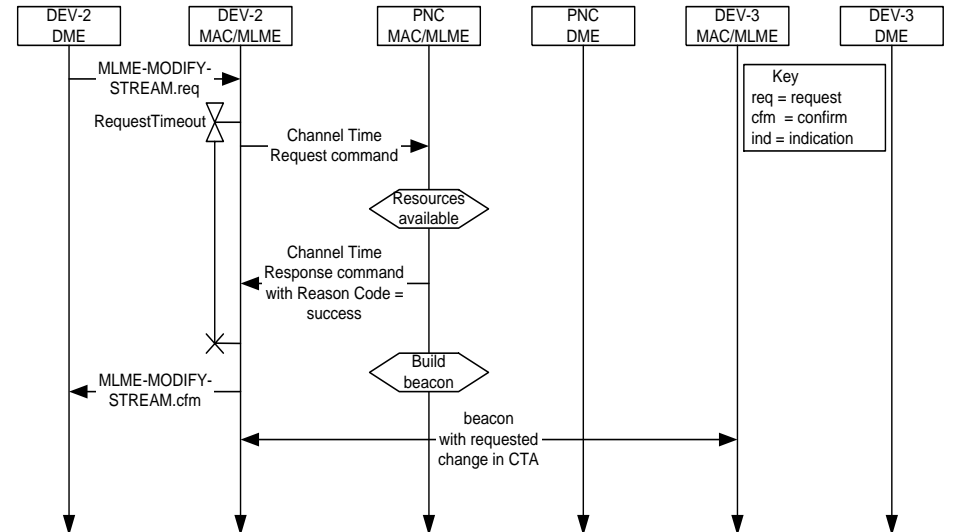
- Imm-ACKs removed.
- DEV-3 added to show it receiving the modified stream information in the beacon.

Figure 118 - Current
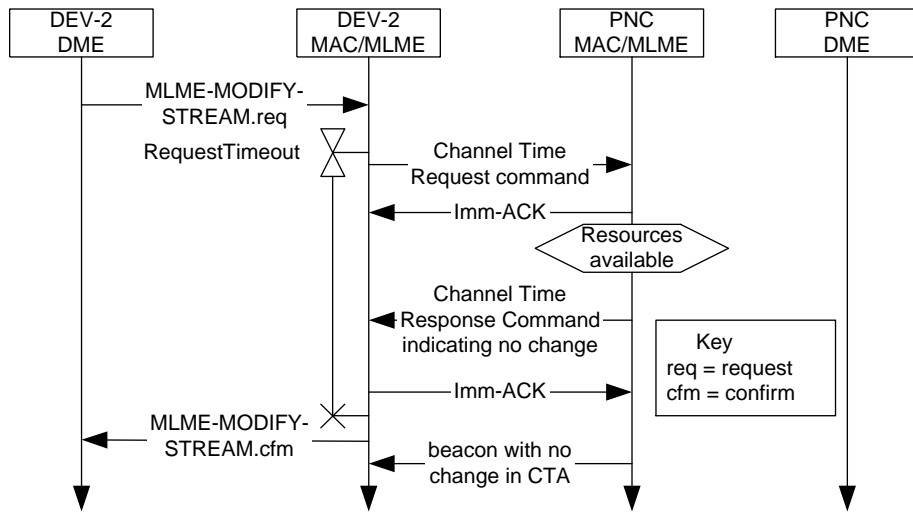
Figure 118 - New

- Imm-ACKs removed.
- DEV-3 added to show it receiving a beacon with no CTA change.
- "Build beacon" added to be consistent with other MSCs that generate beacons.
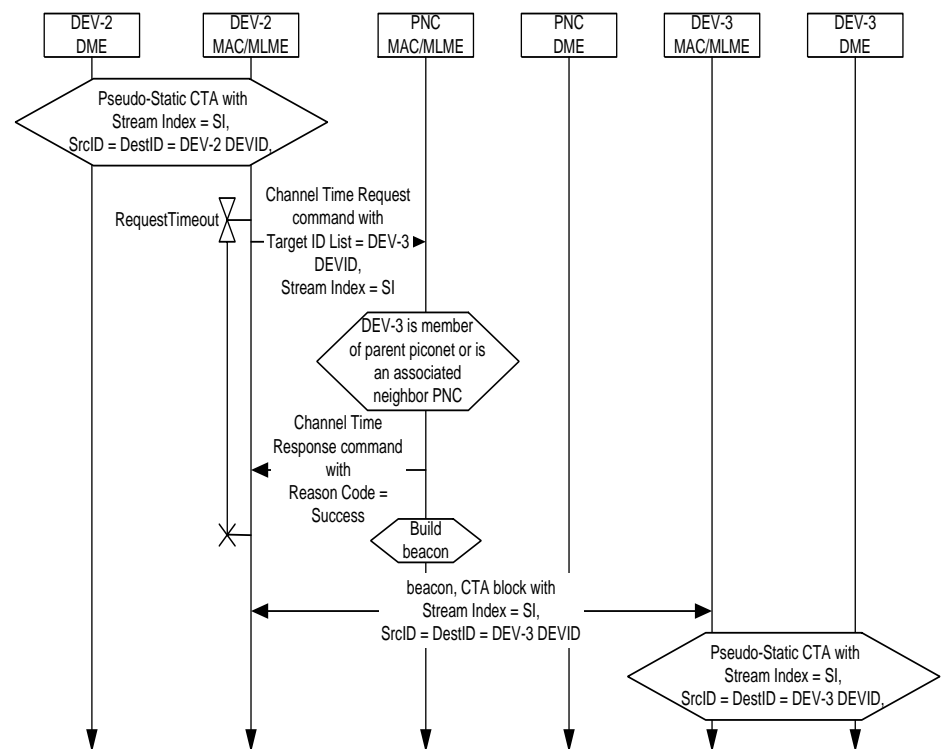
Figure 119 - Current

Figure 119 - New

- Imm-ACKs removed.
- DEV-3 added to show it receiving the modified stream information in the beacon.
- State information added to DEV-3 to show it now has the private CTA that DEV-2 originally had.
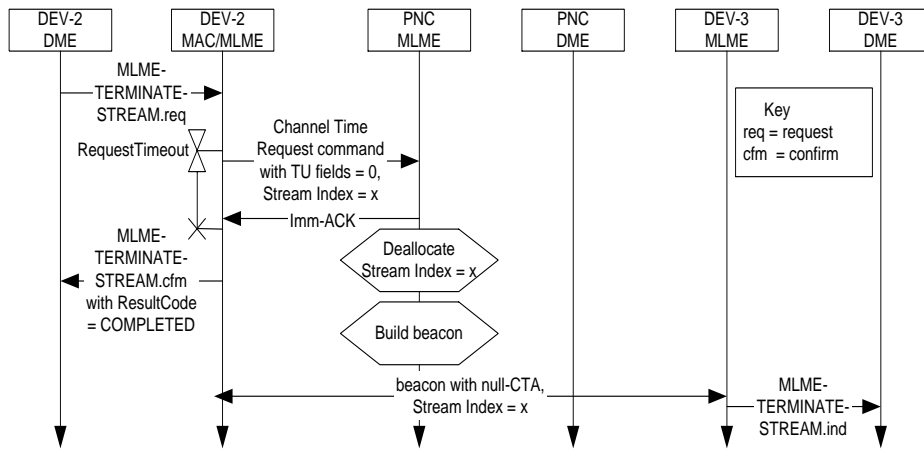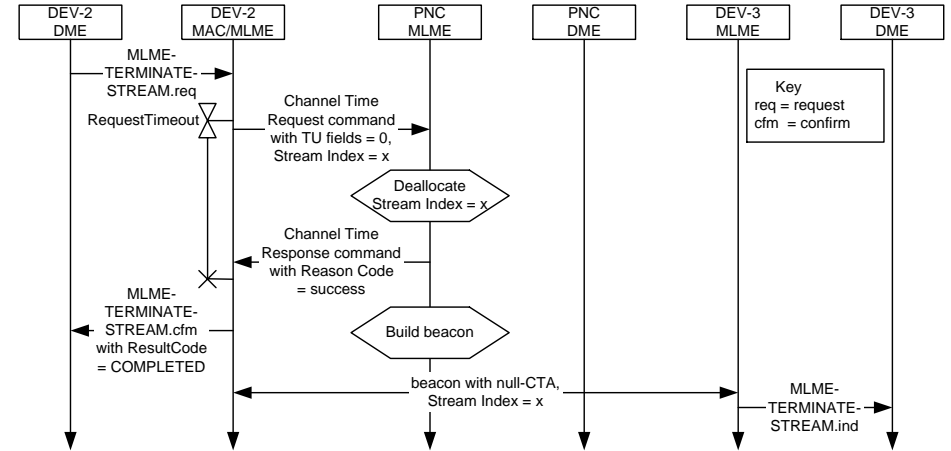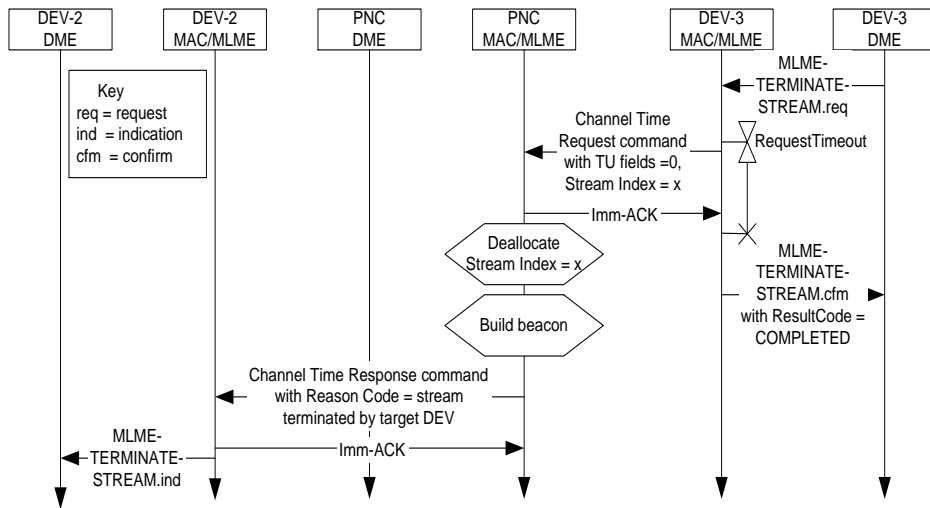
Figure 120 - Current
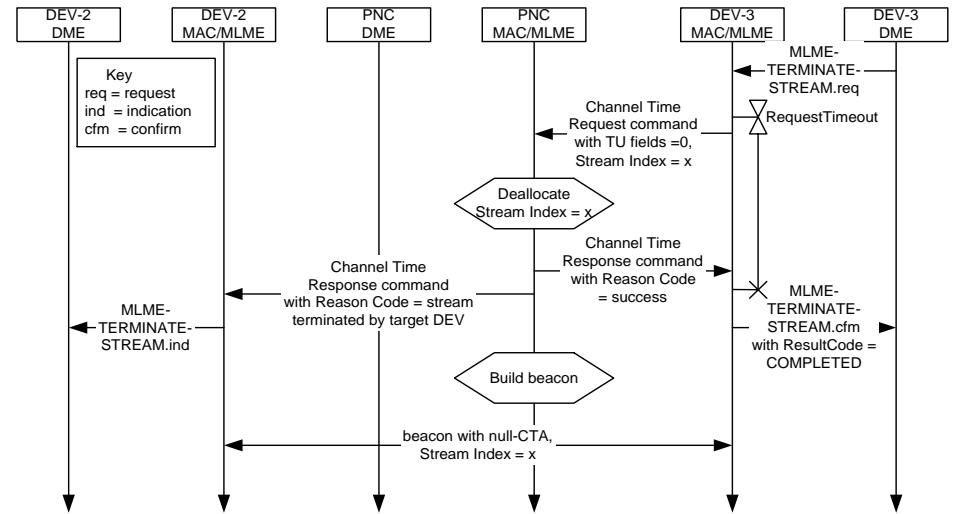

Figure 120 - New

- Imm-ACK removed.
- Channel Time Response command added and generated after the resources are deallocated.

Figure 121 - Current

Figure 121 - New

- Imm-ACKs removed.
- Channel Time Response command added from PNC to DEV-3 and generated after the resources are deallocated.
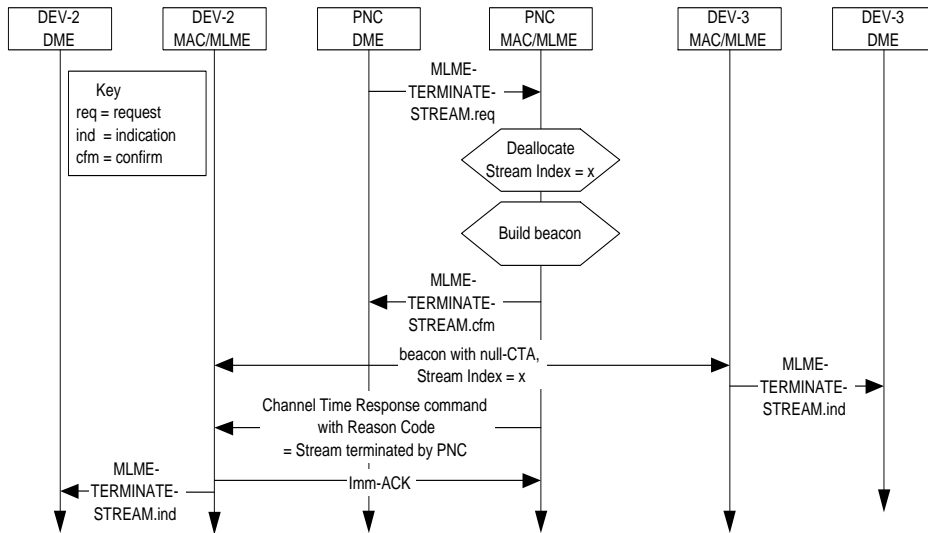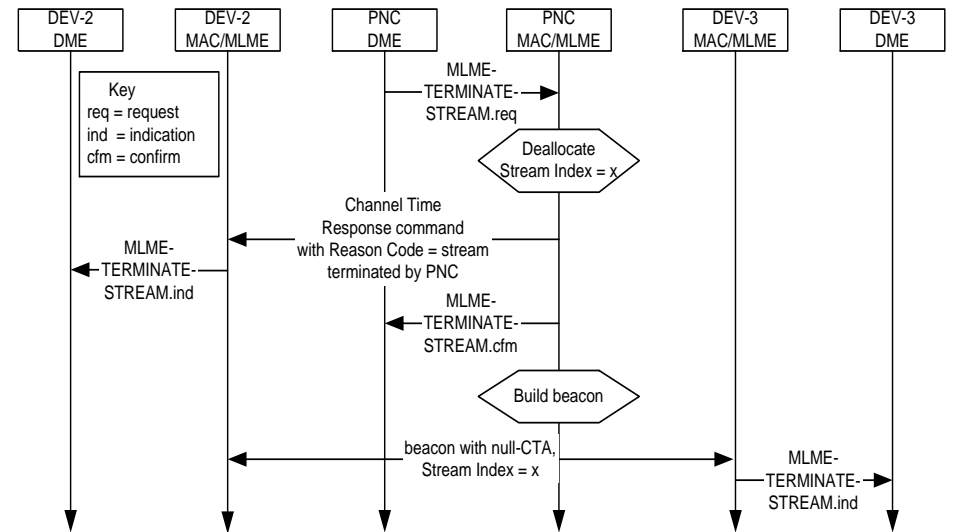
Figure 122 - Current

Figure 122 - New

- Imm-ACK removed.
- Channel Time Response command from PNC to DEV-2 moved to occur after the resources are deallocated (Beacon generation occurs "sometime in the future".)

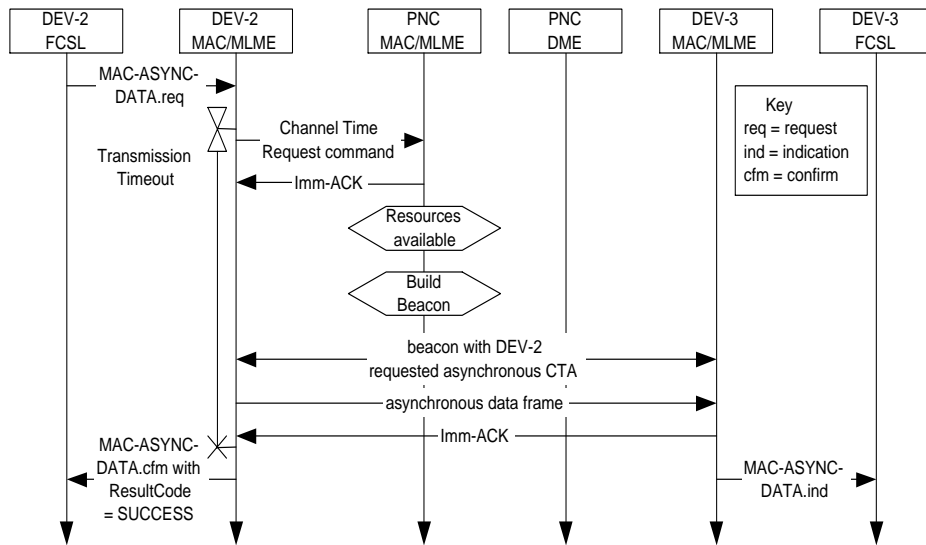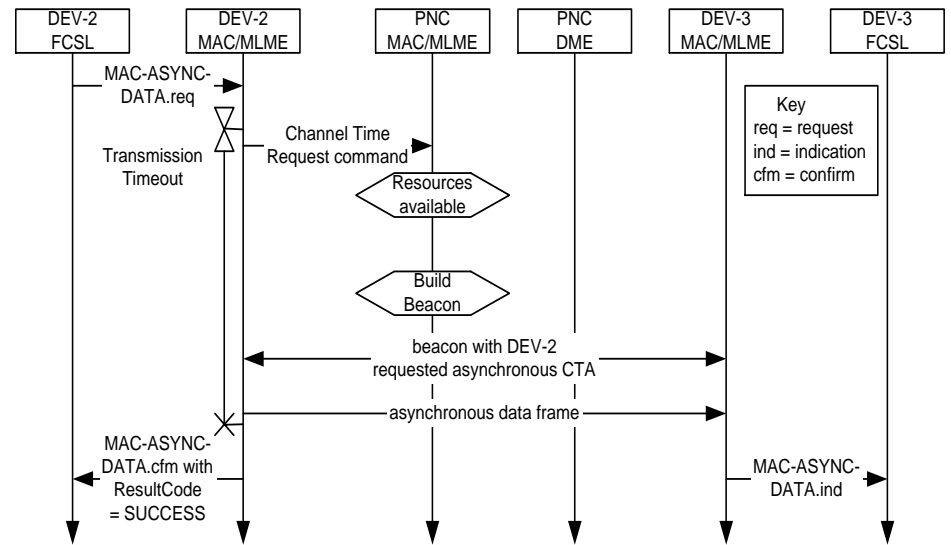## Figure 123 - Current

Figure 123 - New

- Imm-ACKs removed.
- MAC-ASYNC-DATA.confirm generated after data is transmitted.

Figure 127 - Current

DEV DME — MLME-PNC-INFO.req → DEV MAC/MLME

PNCInfoTimeout

DEV MAC/MLME — PNC Info Request command → PNC MAC/MLME

PNC MAC/MLME — Imm-ACK → DEV MAC/MLME

PNC MAC/MLME — MLME-PNC-INFO.ind → PNC DME

PNC DME — MLME-PNC-INFO.rsp → PNC MAC/MLME

PNC MAC/MLME — PNC Information command → DEV MAC/MLME

DEV MAC/MLME — Imm-ACK → PNC MAC/MLME

DEV MAC/MLME — MLME-PNC-INFO.cfm with ResultCode = SUCCESS → DEV DME

Key
req = request
ind = indication
rsp = response
cfm = confirm

Figure 127 - New

DEV DME — MLME-PNC-INFO.req → DEV MAC/MLME

PNCInfoTimeout

DEV MAC/MLME — PNC Info Request command → PNC MAC/MLME

PNC MAC/MLME — MLME-PNC-INFO.ind → PNC DME

PNC DME — MLME-PNC-INFO.rsp → PNC MAC/MLME

PNC MAC/MLME — PNC Information command → DEV MAC/MLME

DEV MAC/MLME — MLME-PNC-INFO.cfm with ResultCode = SUCCESS → DEV DME

Key
req = request
ind = indication
rsp = response
cfm = confirm

- Imm-ACKs removed.

Figure 128 - Current

| DEV-3 DME | DEV-3 MAC/MLME | DEV-2 MAC/MLME | DEV-2 DME |

- MLME-PROBE.req
- ProbeTimeout
- Probe Request command with IR field = yy
- MLME-PROBE.ind
- Imm-ACK
- MLME-PROBE.rsp
- Probe Response command with IEs Provided = requested IEs
- Imm-ACK
- MLME-PROBE.cfm with ResultCode = SUCCESS

Key
req = request
ind = indication
rsp = response
cfm = confirm
IR = information requested
IE = information element

Figure 128 - New

| DEV-3 DME | DEV-3 MAC/MLME | DEV-2 MAC/MLME | DEV-2 DME |

- MLME-PROBE.req
- ProbeTimeout
- Probe Request command with IR field = yy
- MLME-PROBE.ind
- MLME-PROBE.rsp
- Probe Response command with IEs Provided = requested IEs
- MLME-PROBE.cfm with ResultCode = SUCCESS

Key
req = request
ind = indication
rsp = response
cfm = confirm
IR = information requested
IE = information element

- Imm-ACKs removed.

Figure 129 - Current

DEV-3 DME	DEV-3 MAC/MLME	DEV-2 MAC/MLME	DEV-2 DME

MLME-ANNOUNCE.req

AnnounceTimeout

Announce command with IEs Provided

Imm-ACK

MLME-ANNOUNCE.ind

MLME-ANNOUNCE.cfm with ResultCode = SUCCESS

Key
req = request
ind = indication
cfm = confirm
IE = information element

Figure 129 - New (Recommended)

DEV-3 DME	DEV-3 MAC/MLME	DEV-2 MAC/MLME	DEV-2 DME

MLME-ANNOUNCE.req

AnnounceTimeout

Announce Request command with IEs Provided

MLME-ANNOUNCE.ind

MLME-ANNOUNCE.rsp

Announce Response command

MLME-ANNOUNCE.cfm with ResultCode = SUCCESS

Key
req = request
ind = indication
rsp = response
cfm = confirm
IE = information element

- Imm-ACK removed.
- Announce command renamed Announce Request command.
- New MLME-ANNOUNCE.response primitive added.
- New Announce Response command added.

Figure 104 - New (Option)

DEV-3 DME	DEV-3 MAC/MLME	DEV-2 MAC/MLME	DEV-2 DME

MLME-ANNOUNCE.req

Announce command with IEs Provided

MLME-ANNOUNCE.ind

Key
req = request
ind = indication
IE = information element

- Announce commands considered "fire and forget".
- Note: One important piece of information passed via the Announce command is Overlapping PNID information.
- No timeout timer.
- No confirmation.

Figure 130 - Current
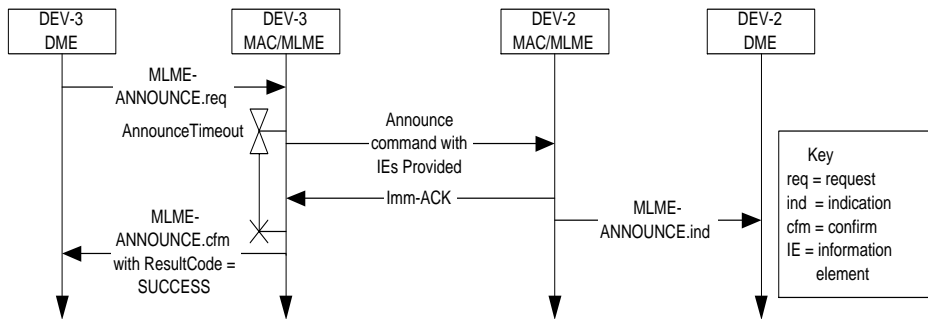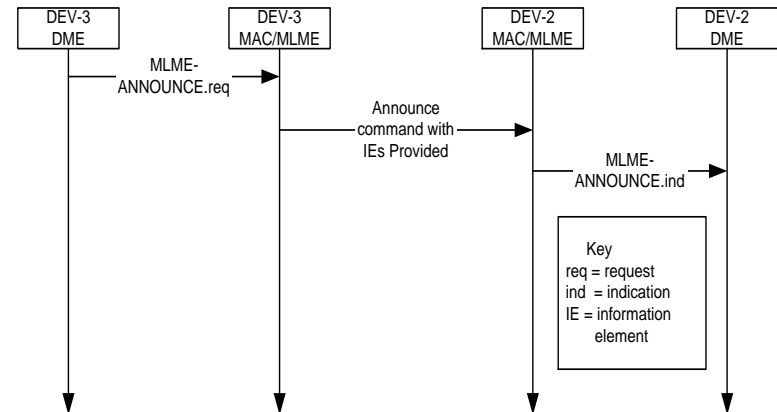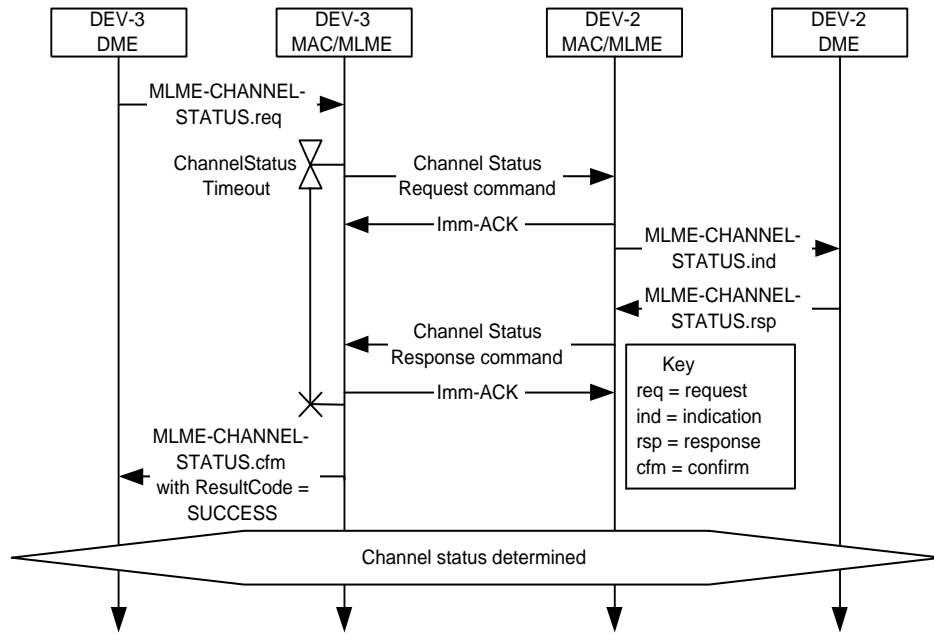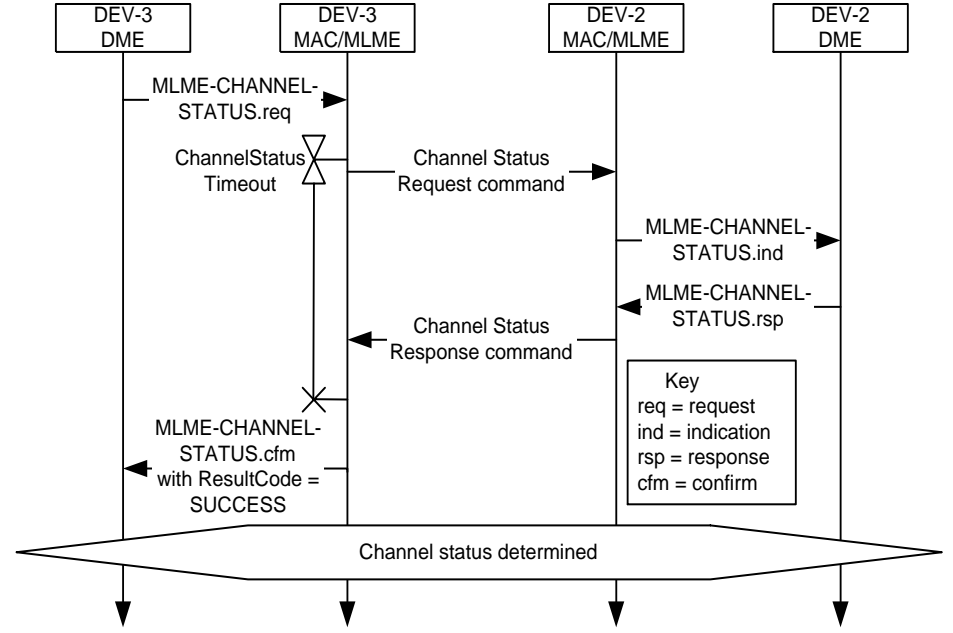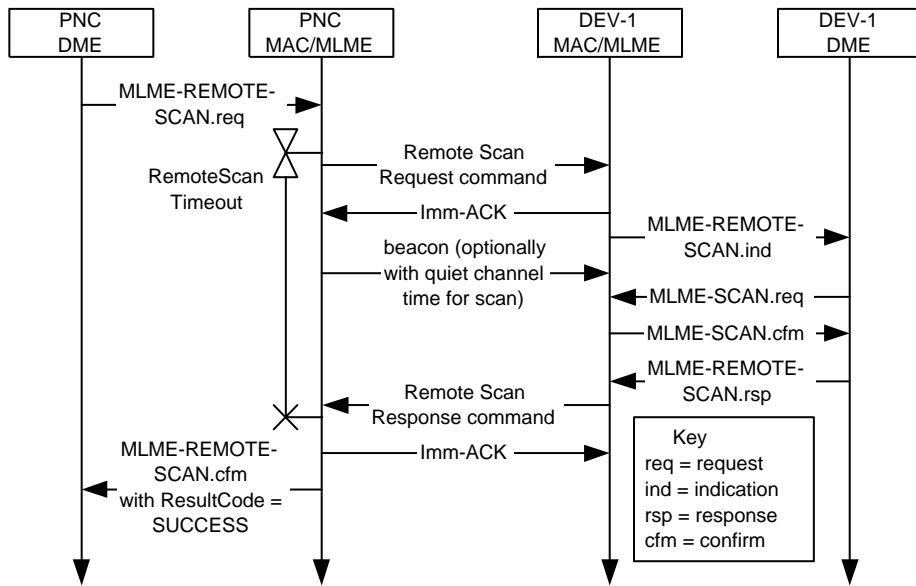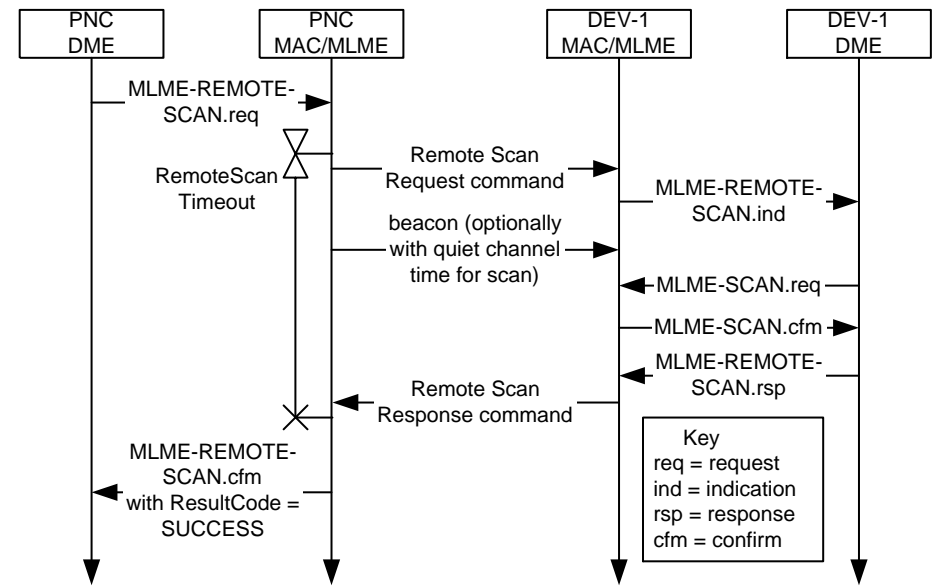

Figure 130 - New

- Imm-ACKs removed.

Figure 131 - Current

| PNC DME | PNC MAC/MLME | DEV-1 MAC/MLME | DEV-1 DME |

MLME-REMOTE-SCAN.req

RemoteScan Timeout

Remote Scan Request command

Imm-ACK

MLME-REMOTE-SCAN.ind

beacon (optionally with quiet channel time for scan)

MLME-SCAN.req

MLME-SCAN.cfm

MLME-REMOTE-SCAN.rsp

Remote Scan Response command

Imm-ACK

MLME-REMOTE-SCAN.cfm with ResultCode = SUCCESS

Key
req = request
ind = indication
rsp = response
cfm = confirm

Figure 131 - New

| PNC DME | PNC MAC/MLME | DEV-1 MAC/MLME | DEV-1 DME |

MLME-REMOTE-SCAN.req

RemoteScan Timeout

Remote Scan Request command

beacon (optionally with quiet channel time for scan)

MLME-REMOTE-SCAN.ind

MLME-SCAN.req

MLME-SCAN.cfm

MLME-REMOTE-SCAN.rsp

Remote Scan Response command

MLME-REMOTE-SCAN.cfm with ResultCode = SUCCESS

Key
req = request
ind = indication
rsp = response
cfm = confirm

• Imm-ACKs removed.

Figure 136 - Current

DEV-2 DME	DEV-2 MAC/MLME	DEV-3 MAC/MLME	DEV-3 DME

MLME-TX-POWER-CHANGE.req
with TrgtID = DEV-2,
TXPowerChange = yy

Transmit Power Change command with TX Power Change = yy

TXPowerChange Timeout

MLME-TX-POWER-CHANGE.ind

Imm-ACK

Key
req = request
ind = indication
cfm = confirm

MLME-TX-POWER-CHANGE.cfm
with ResultCode = SUCCESS

Figure 136 - New

DEV-2 DME	DEV-2 MAC/MLME	DEV-3 MAC/MLME	DEV-3 DME

Key
req = request
ind = indication
rsp = response
cfm = confirm

MLME-TX-POWER-CHANGE.req
with TrgtID = DEV-2,
TXPowerChange = yy

Transmit Power Change Request command with TX Power Change = yy

TXPowerChange Timeout

MLME-TX-POWER-CHANGE.ind

MLME-TX-POWER-CHANGE.rsp

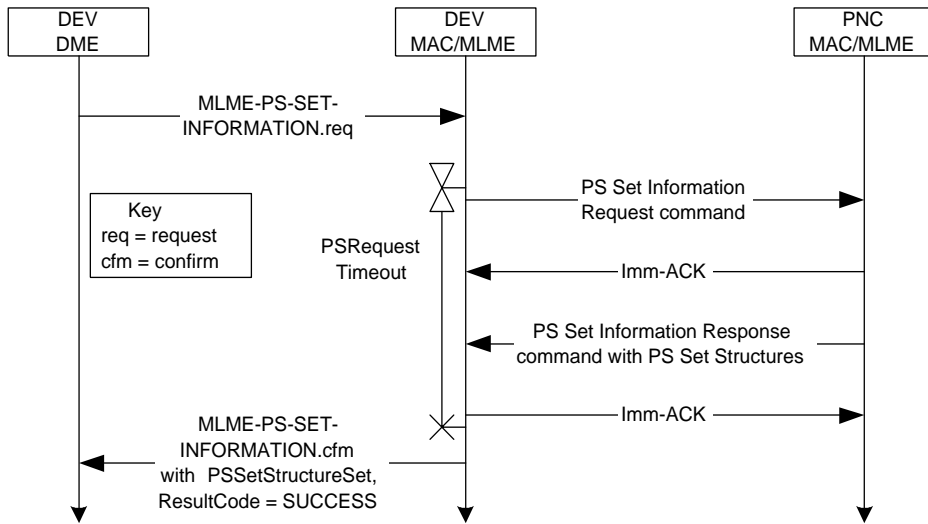Transmit Power Change Response command

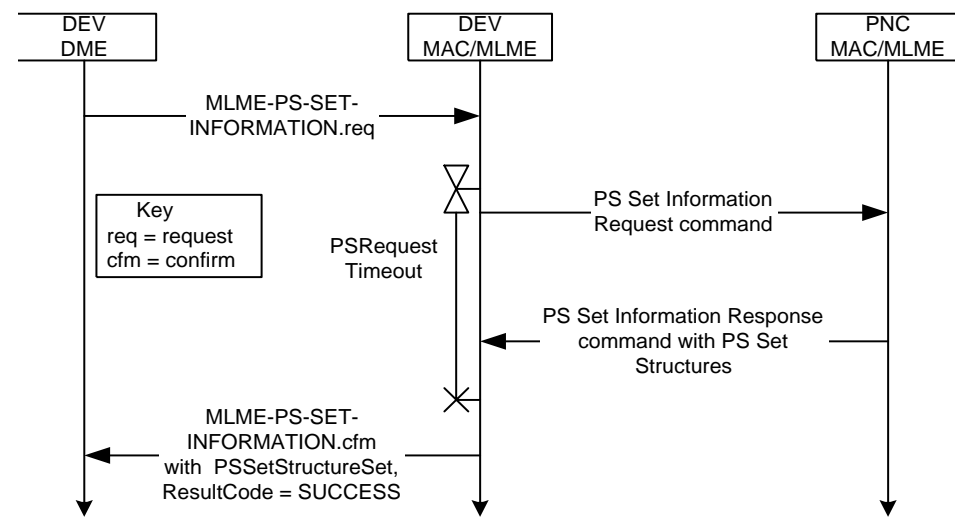MLME-TX-POWER-CHANGE.cfm
with ResultCode = SUCCESS

- Imm-ACK removed.
- Transmit Power Change command renamed Transmit Power Change Request command.
- New MLME-TX-POWER-CHANGE.response primitive added.
- New Transmit Power Change Response command added which includes the current power level to aid the requester to know which Transmit Power Change Request commands were received by the target.
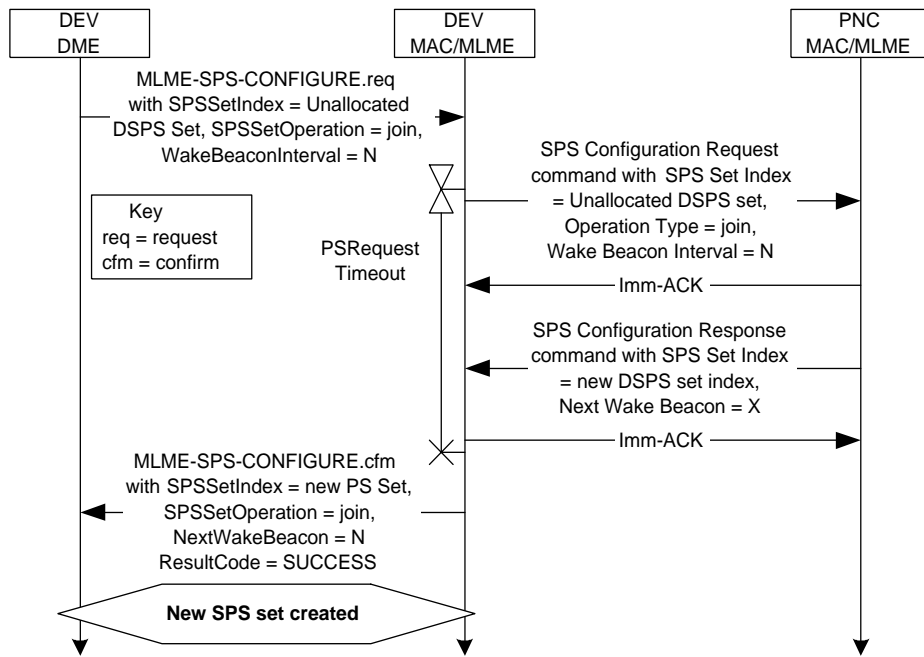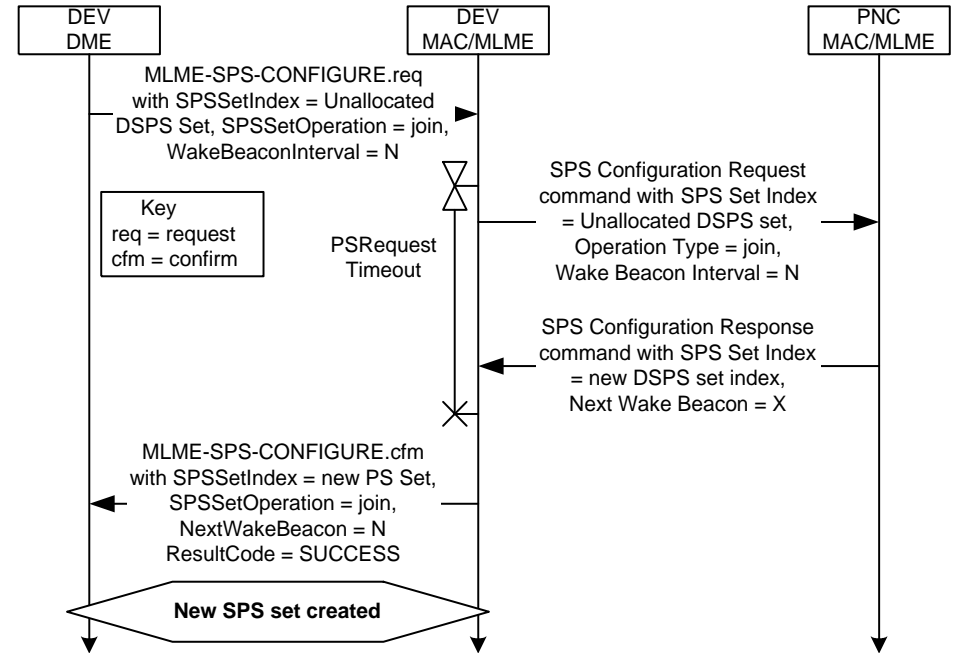
Figure 140 - Current

Figure 140 - New

• Imm-ACKs removed.

Figure 141 - Current
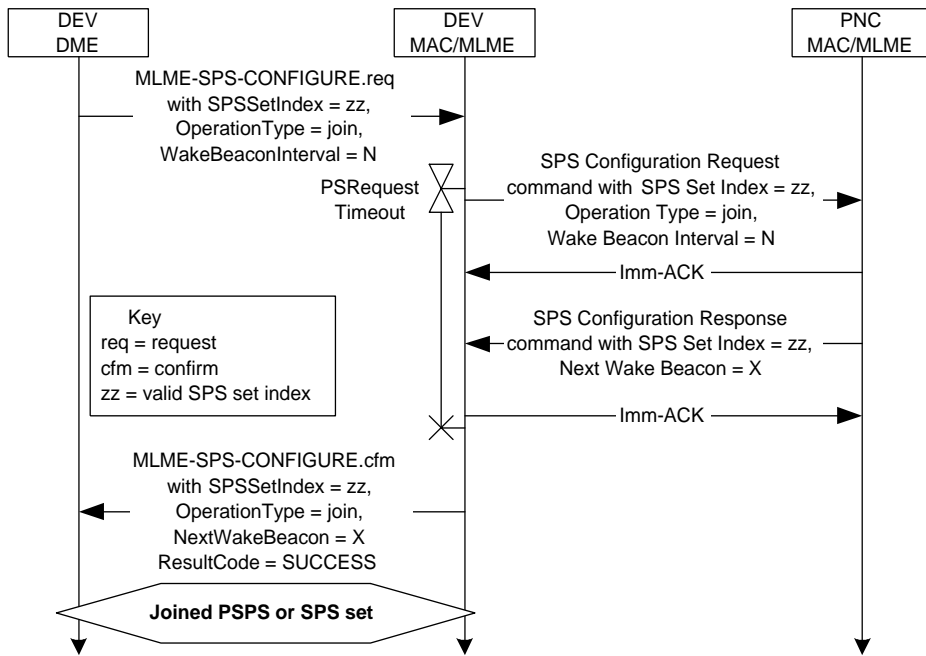
DEV DME	DEV MAC/MLME	PNC MAC/MLME

MLME-SPS-CONFIGURE.req
with SPSSetIndex = Unallocated
DSPS Set, SPSSetOperation = join,
WakeBeaconInterval = N

SPS Configuration Request
command with SPS Set Index
= Unallocated DSPS set,
Operation Type = join,
Wake Beacon Interval = N

Key
req = request
cfm = confirm

PSRequest
Timeout

Imm-ACK

SPS Configuration Response
command with SPS Set Index
= new DSPS set index,
Next Wake Beacon = X

Imm-ACK

MLME-SPS-CONFIGURE.cfm
with SPSSetIndex = new PS Set,
SPSSetOperation = join,
NextWakeBeacon = N
ResultCode = SUCCESS

New SPS set created

Figure 141 - New

DEV DME	DEV MAC/MLME	PNC MAC/MLME

MLME-SPS-CONFIGURE.req
with SPSSetIndex = Unallocated
DSPS Set, SPSSetOperation = join,
WakeBeaconInterval = N

SPS Configuration Request
command with SPS Set Index
= Unallocated DSPS set,
Operation Type = join,
Wake Beacon Interval = N

Key
req = request
cfm = confirm

PSRequest
Timeout

SPS Configuration Response
command with SPS Set Index
= new DSPS set index,
Next Wake Beacon = X

MLME-SPS-CONFIGURE.cfm
with SPSSetIndex = new PS Set,
SPSSetOperation = join,
NextWakeBeacon = N
ResultCode = SUCCESS

New SPS set created

- Imm-ACKs removed.

Figure 142 - Current

DEV
DME

DEV
MAC/MLME

PNC
MAC/MLME

MLME-SPS-CONFIGURE.req
with SPSSetIndex = zz,
OperationType = join,
WakeBeaconInterval = N

PSRequest
Timeout

SPS Configuration Request
command with SPS Set Index = zz,
Operation Type = join,
Wake Beacon Interval = N

Imm-ACK

Key
req = request
cfm = confirm
zz = valid SPS set index

SPS Configuration Response
command with SPS Set Index = zz,
Next Wake Beacon = X

Imm-ACK

MLME-SPS-CONFIGURE.cfm
with SPSSetIndex = zz,
OperationType = join,
NextWakeBeacon = X
ResultCode = SUCCESS

Joined PSPS or SPS set

Figure 142 - New

DEV
DME

DEV
MAC/MLME

PNC
MAC/MLME

MLME-SPS-CONFIGURE.req
with SPSSetIndex = zz,
OperationType = join,
WakeBeaconInterval = N

PSRequest
Timeout

SPS Configuration Request
command with SPS Set Index = zz,
Operation Type = join,
Wake Beacon Interval = N

Key
req = request
cfm = confirm
zz = valid SPS set index

SPS Configuration Response
command with SPS Set Index = zz,
Next Wake Beacon = X

MLME-SPS-CONFIGURE.cfm
with SPSSetIndex = zz,
OperationType = join,
NextWakeBeacon = X
ResultCode = SUCCESS

Joined PSPS or SPS set

- Imm-ACKs removed.

Figure 143 - Current

Figure 143 - New

- Imm-ACK replaced with SPS Configuration Response command.

Figure 144 - Current

Figure 144 - New

- PM Mode Change command renamed PM Mode Change Request command.
- Imm-ACK replaced with new PM Mode Change Response command.
- DEV-3 added to show a DEV receiving PS Status information in the Beacon.
- New MLME-PM-MODE-CHANGE.indication primitive added.
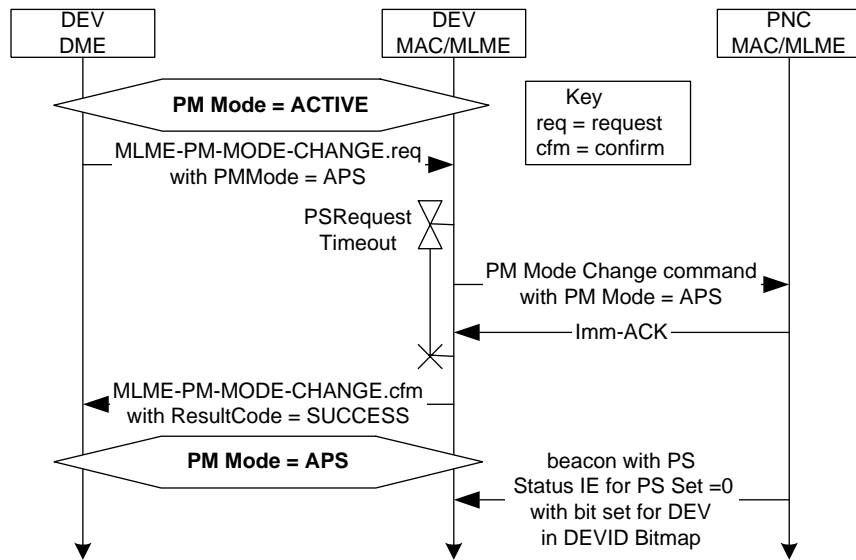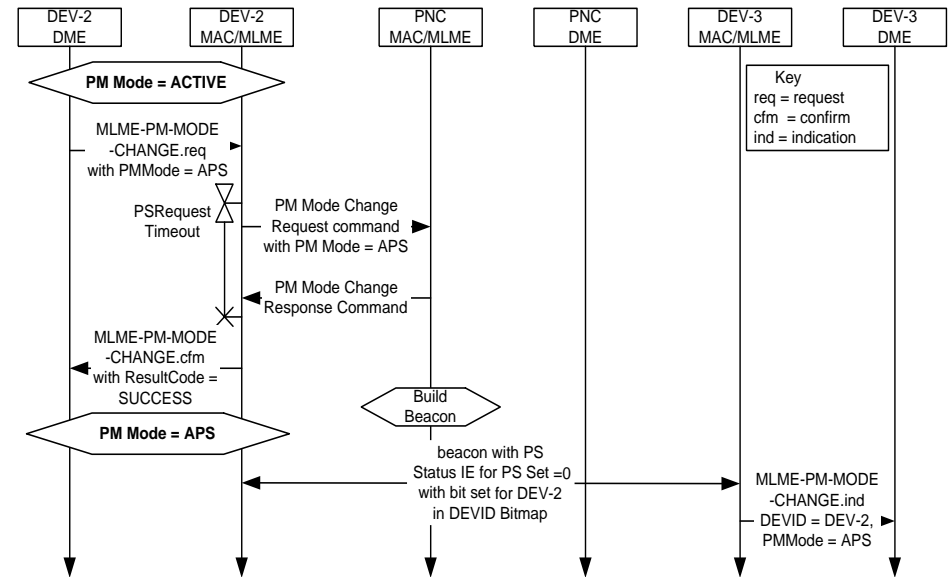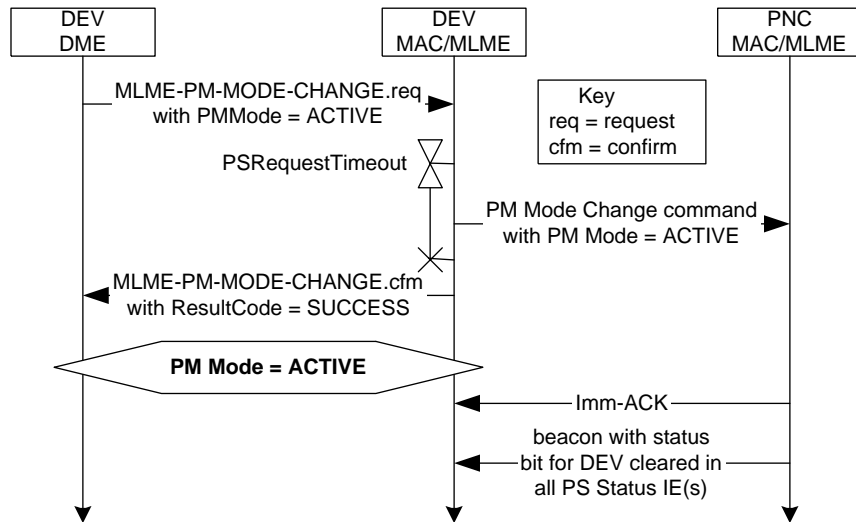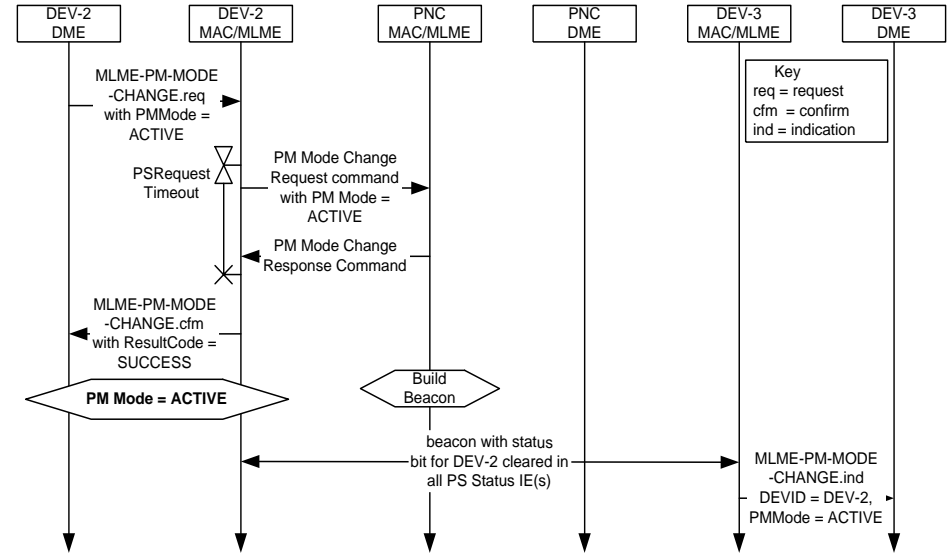
Figure 145 - Current

Figure 145 - New

- PM Mode Change command renamed PM Mode Change Request command.
- Imm-ACK replaced with new PM Mode Change Response command.
- DEV-3 added to show a DEV receiving PS Status information in the Beacon.
- New MLME-PM-MODE-CHANGE.indication primitive added.
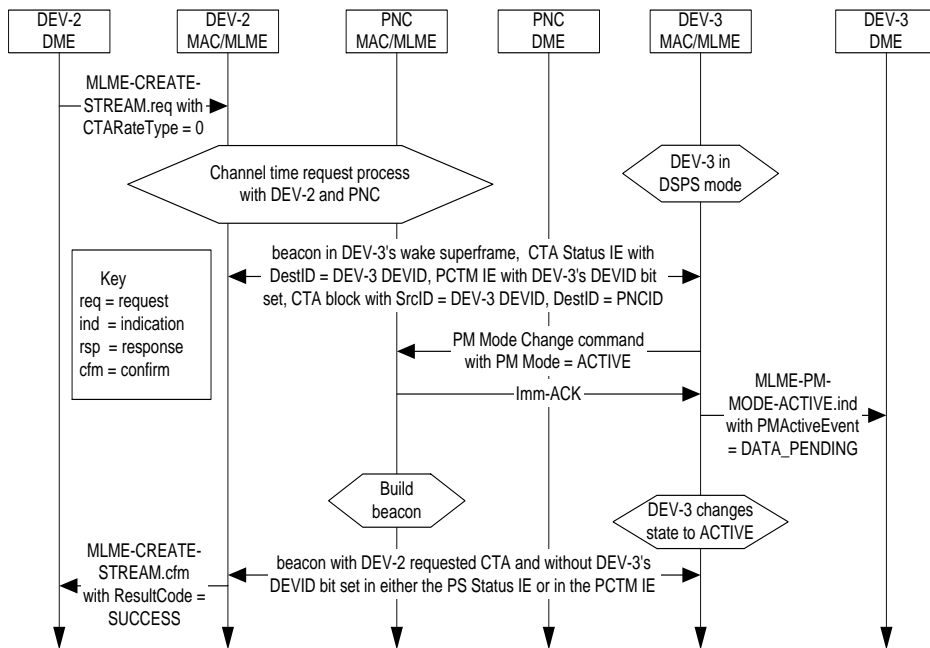
Figure 146 - Current

Figure 146 - New

- PM Mode Change command renamed PM Mode Change Request command.
- Imm-ACK replaced with new PM Mode Change Response command.
- DEV-3 added to show a DEV receiving PS Status information in the Beacon.
- New MLME-PM-MODE-CHANGE.indication primitive added.
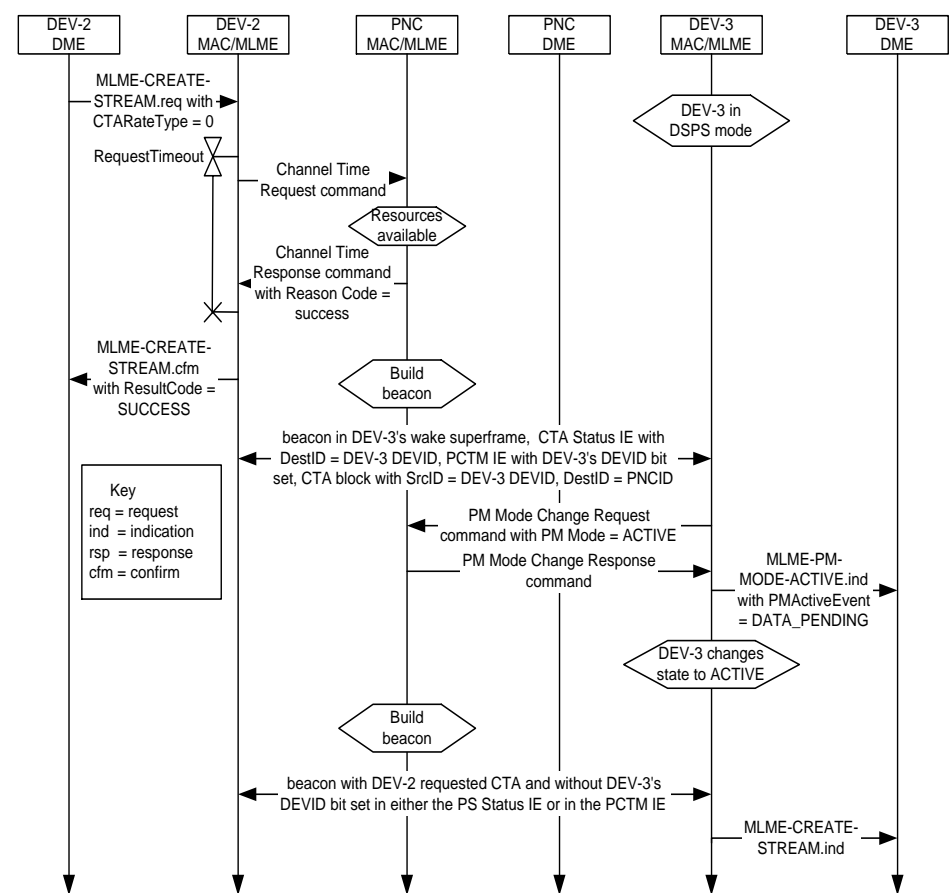
Figure 147 - Current

Figure 147 - New

- MLME-CREATE-STREAM.cfm primitive generated after Channel Time Response command is received. The DEV then waits for a beacon with allocated channel time as normal.
- PM Mode Change command renamed PM Mode Change Request command.
- Imm-ACK replaced with new PM Mode Change Response command.

3. Textual changes

TBD