

## ZigBee 3.0 child-aging mechanism

### ZigBee PRO 2015 (R21) Specification

#### Child device management

- The child-aging mechanism is now fully implemented. A parent device now must age out neighbor table entries for child end devices by a **pre-configured default timeout**.
- Aging timeout can be changed per end device upon request from that end device using **End Device Timeout Request** command.
- Periodic keep-alive indications must be sent from a child end device to reset the aging counter on its parent. The standard method is to configure both devices to use the **MAC data polling** method of keep-alive indications. This will allow parent routing devices to properly age out legacy devices as well as 3.0 devices, based on the elapsed time from its last MAC data poll.
  - If a child device is aged out by a parent, that parent will send the device a leave request with Rejoin=1, which will allow the device to rejoin the network through a new parent device.

#### Parent Announce Command

- The Parent Announce (**Parent\_annce**) message is mandatory on all routing devices (ZR/ZC) and is used to notify other routing devices in a network of which child devices are known to it.
- This message will be broadcast to 0xFFFFC if a routing device previously in the network was rebooted and successfully rejoins the network. It is sent out 10-20 seconds after this device rejoins the network.

```
/**< End device timeout request */
#define ZPS_NWK_FRM_CMD_NWK_ED_TIMEOUT_REQ      0x0B
/**< End Device timeout response */
#define ZPS_NWK_FRM_CMD_NWK_ED_TIMEOUT_RSP      0x0C
```

In file \$source\app\_zlo\_sensor\_node.c

```
PUBLIC void APP_vInitialiseNode(void)
```

```
{
    .....
    /* Set end device age out time to 11 days 9 hours & 4 mins */
    ZPS_bAplAfSetEndDeviceTimeout(ZED_TIMEOUT_16384_MIN);
    .....
}
```

```
typedef enum {
```

```
    ZED_TIMEOUT_10_SEC,          // 0 -> 10 seconds
    ZED_TIMEOUT_2_MIN,           // 1 -> 2 minutes
    ZED_TIMEOUT_4_MIN,           // 2 -> 4 minutes
    ZED_TIMEOUT_8_MIN,           // 3 -> 8 minutes
    ZED_TIMEOUT_16_MIN,          // 4 -> 16 minutes
    ZED_TIMEOUT_32_MIN,          // 5 -> 32 minutes
    ZED_TIMEOUT_64_MIN,          // 6 -> 64 minutes
    ZED_TIMEOUT_128_MIN,         // 7 -> 128 minutes
    ZED_TIMEOUT_256_MIN,         // 8 -> 256 minutes (4 hrs 16 min)
    ZED_TIMEOUT_512_MIN,         // 9 -> 512 minutes (8 hrs 32 min)
    ZED_TIMEOUT_1024_MIN,        // 10 -> 1024 minutes (17 hrs 4 min)
```

```
ZED_TIMEOUT_2048_MIN, // 11 -> 2048 minutes (1 day 10 hrs 8 min)
ZED_TIMEOUT_4096_MIN, // 12 -> 4096 minutes (2 days 20 hrs 16 min)
ZED_TIMEOUT_8192_MIN, // 13 -> 8192 minutes (5 days 16 hrs 32 min)
ZED_TIMEOUT_16384_MIN, // 14 -> 16384 minutes (11 days 9 hrs 4 min)
ZED_TIMEOUT_INDEX_MAX,
ZED_TIMEOUT_UNDEFINED = 0xff
```

```
}teZedTimeout;
```

In ZigBee3.0 sniffer log

15	ZigBee	ZDP	Device Announce	0x0001	0x0003	0x0001	0xFFFD
15	ZigBee	MAC	Acknowledgement				
15	ZigBee	NWK	Unknown	0x0001	0x0003	0x0001	0x0003
15	ZigBee	MAC	Acknowledgement				
15	ZigBee	ZDP	Device Announce	0x0003	0xFFFF	0x0001	0xFFFD
15	ZigBee	ZDP	Device Announce	0x0002	0xFFFF	0x0001	0xFFFD
15	ZigBee	MAC	Data Request	0x0001	0x0003		
15	ZigBee	MAC	Acknowledgement				
15	ZigBee	NWK	Unknown	0x0003	0x0001	0x0003	0x0001
15	ZigBee	MAC	Acknowledgement				

- MAC Header: (9 bytes)
- MAC Payload: (37 bytes)
  - NWK Header: (16 bytes)
    - NWK Aux Header: (14 bytes)
      - Network Security Control: 0x28
      - NWK Frame Counter: 16
      - Source Address: 00:15:8D:00:01:CB:24:74
      - NWK Key Sequence Number: 0
    - NWK Payload: 0x000E0E
      - NWK Command ID: [0x0B] Unknown
      - NWK MIC: 0xCC9650B0