AUTOSAR Nm Coordinator

KPIT

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Agenda

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- NM Coordinator
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- Nm Coordinator – Use Case 2
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AUTOSAR Nm

- The Generic Network Management Interface is an adaptation layer between the AUTOSAR Communication Manager and the AUTOSAR bus specific network management modules (e.g. CAN Network Management and FlexRay Network Management). This is also referred to as Basic functionality.

- A Generic Network Management Interface implementation can either support only Basic functionality or both Basic functionality and NM Coordinator functionality.

- The Generic Network Management Interface is constructed to support generic lower layer modules that follow a fixed set of requirement for bus specific NM modules. This will allow third parties to offer support for OEM specific or legacy NM protocols such as direct OSEK NM.

- The NM Interface functionality consists of two parts:
  - ✓ The Base functionality necessary to run, together with the bus specific NM modules, AUTOSAR NM on an ECU.
  - ✓ The NM Coordinator functionality used by gateway ECUs to synchronously shut down one ore more busses.

NM Coordinator functionality

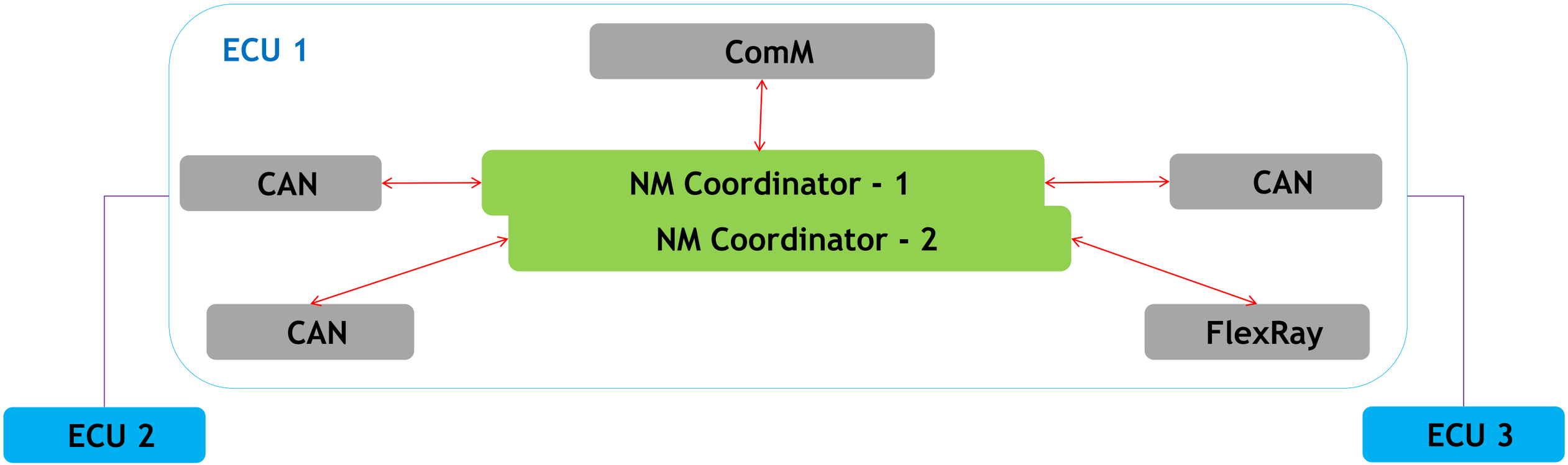
- **NM Coordinator functionality is a functionality of Nm that uses a coordination algorithm to coordinate the shutdown of NM on all, or one or more independent subsets of the busses that the ECU is connected to**

- **The NM Coordinator shall be able to coordinate busses running the official AUTOSAR bus specific NMs (CanNm, FrNm, LinNm and UdpNm) as well as all other generic bus NMs**

- **As long as at least one node (including the node implementing the NM Coordinator) keeps any of the busses in the coordination cluster awake, the NM Coordinator shall keep all busses of that coordination cluster awake.**

- **It shall be possible to configure multiple NM coordination clusters that shall be coordinated independently**

Nm Coordinator



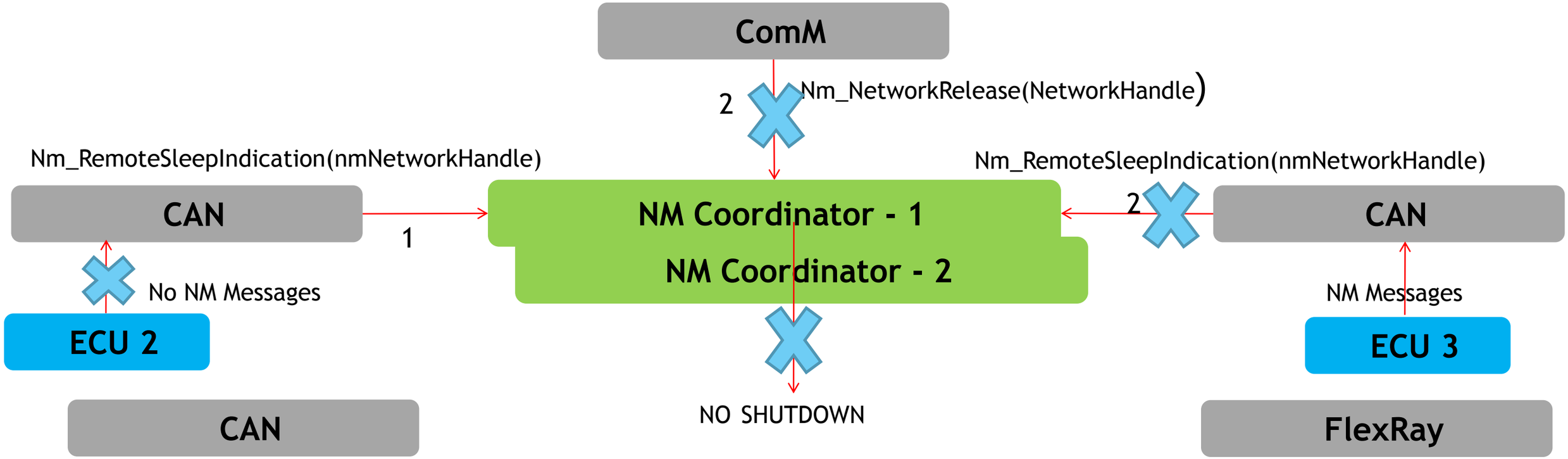
An ECU using an NM that actively performs the NM Coordinator functionality is commonly referred to as an NM Coordinator

1. NM coordination algorithm 1 - CAN <-> CAN
2. NM coordination algorithm 2 - CAN <-> FlexRay
3. ComM – Local Ecu Request <-> To release the Network

Nm Coordinator – Contd.

1. **If no NM-messages with an indication to keep the bus awake are received in the Normal Operation State for a configurable amount of time then the NM shall notify the Generic NM Interface module that all other nodes in the cluster are ready to sleep (the ‘Remote Sleep Indication’) by calling Nm_RemoteSleepIndication.**

Nm Coordinator – Use Case 1

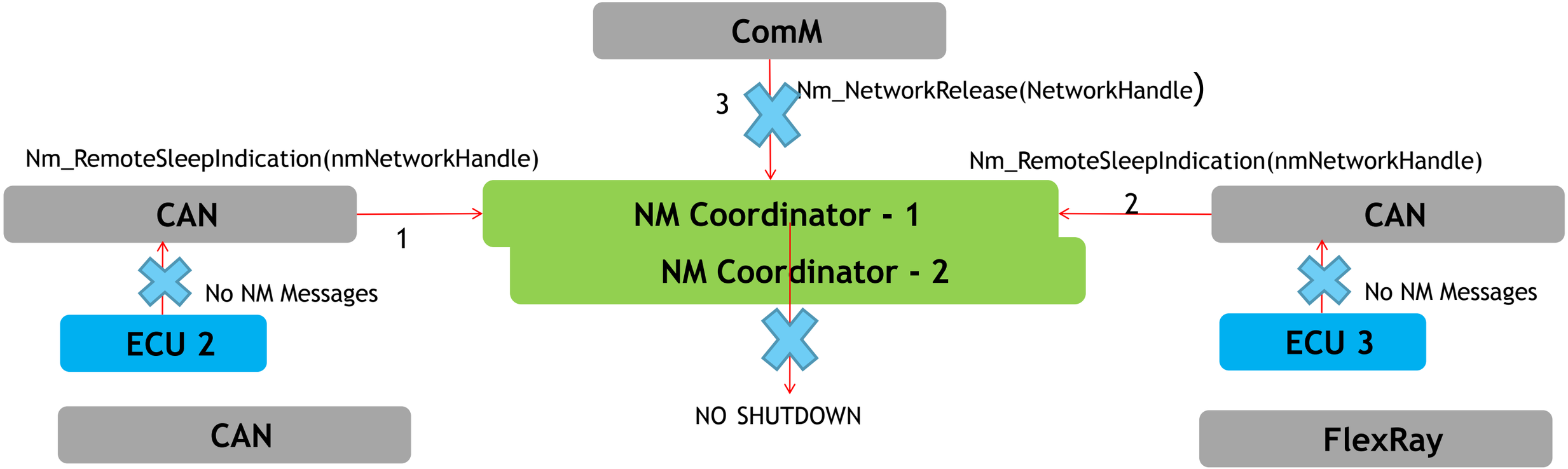


Nm Coordinator 1

Conditions to check for Shutdown

1. **The bus specific NMs will indicate to Nm if the bus is ready to go to sleep or not by calling the callbacks Nm_RemoteSleepIndication()**
2. **As long as at least one bus in the coordination cluster is not ready to sleep (i.e. because another node than the NM Coordinator is requesting that bus), the NM Coordinator shall still ensure that the network is requested on all currently active busses in that coordination cluster even if the local ECU itself is ready to go to sleep on all busses of that coordination cluster**

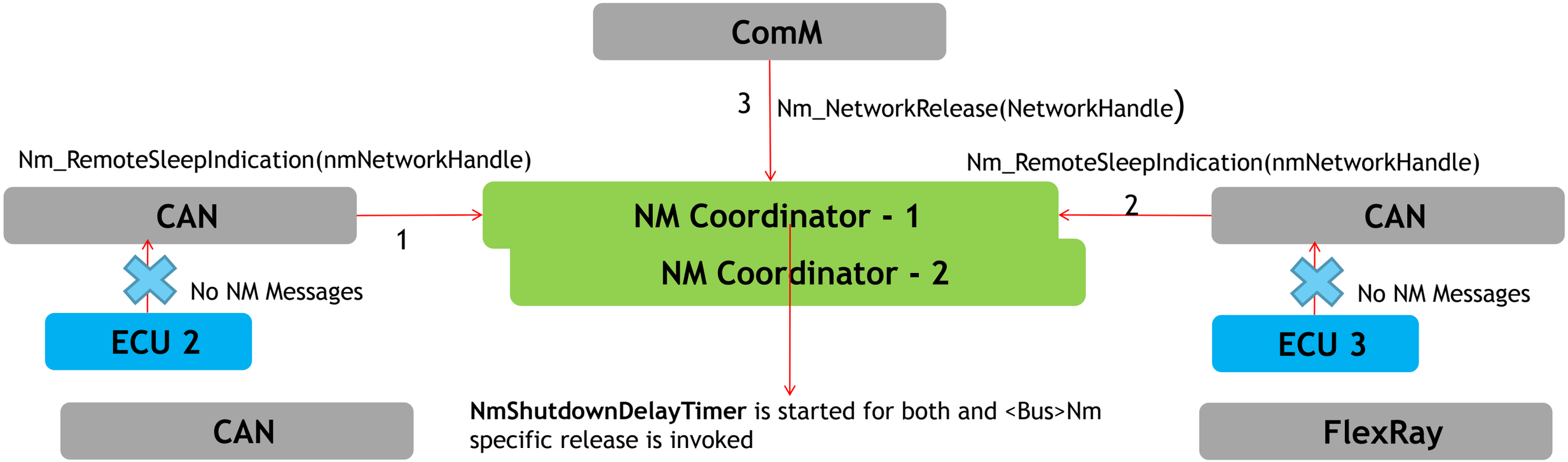
Nm Coordinator – Use Case 2



Nm Coordinator 1

The ComM is not allowing for ready to sleep (Local Ecu Request)

Nm Coordinator – Use Case 3

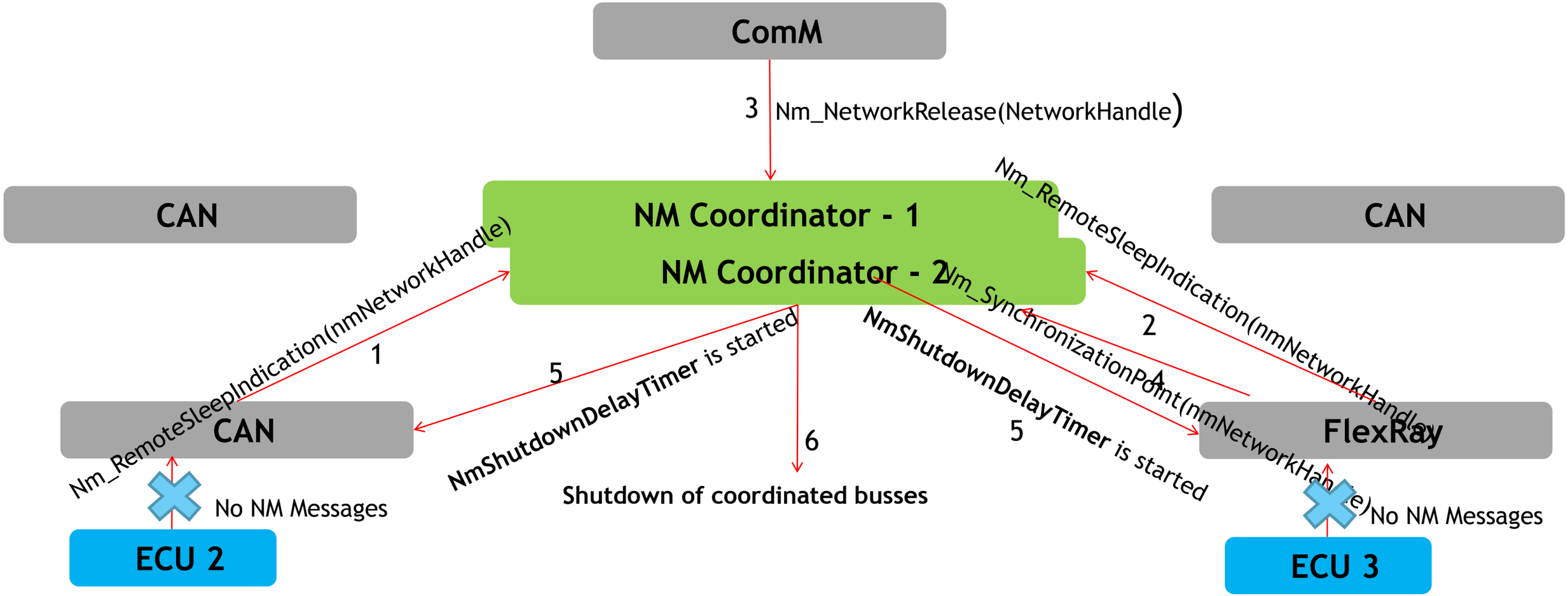


Nm Coordinator 1

All the busses in a coordination cluster and ComM is now ready to sleep

Shutdown of coordinated busses

Nm Coordinator – Use Case 4



Nm Coordinator 2

CAN and FlexRay is now ready to sleep and ComM is also released

The shutdown timers for all coordinated networks will not be started until the synchronizing network has called the Nm_SynchronizationPoint()

Questions

Thank You

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