# Sleep Mode and Idle Mode Operations for IEEE 802.16j

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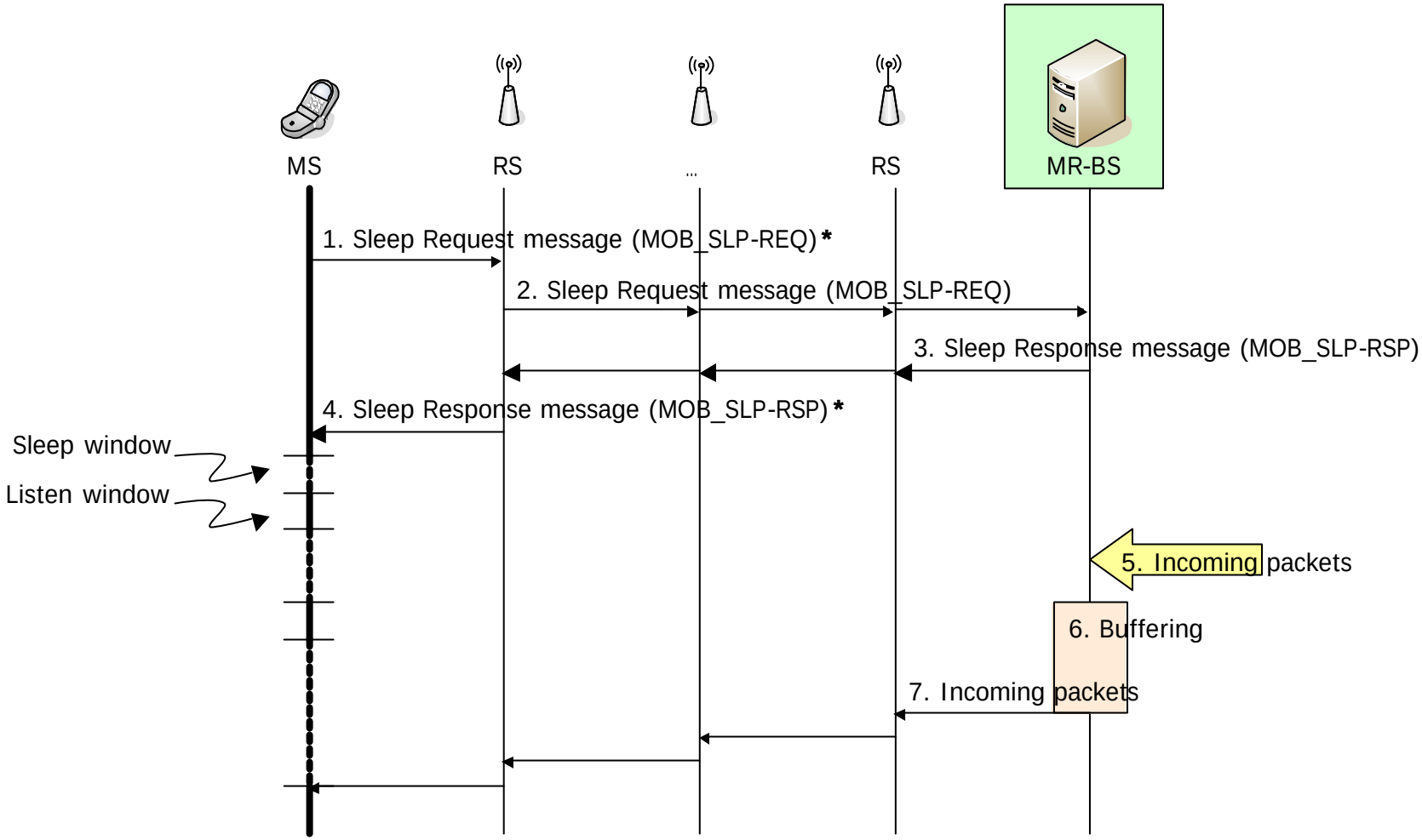
Purpose:
This document suggests the usages of IEEE 802.16e messages and introduces new parameters in these messages to facilitate the sleep mode and idle mode operations in IEEE 802.16j

# Sleep Mode Operation for IEEE 802.16j

- Admission control and buffering on MR-BS



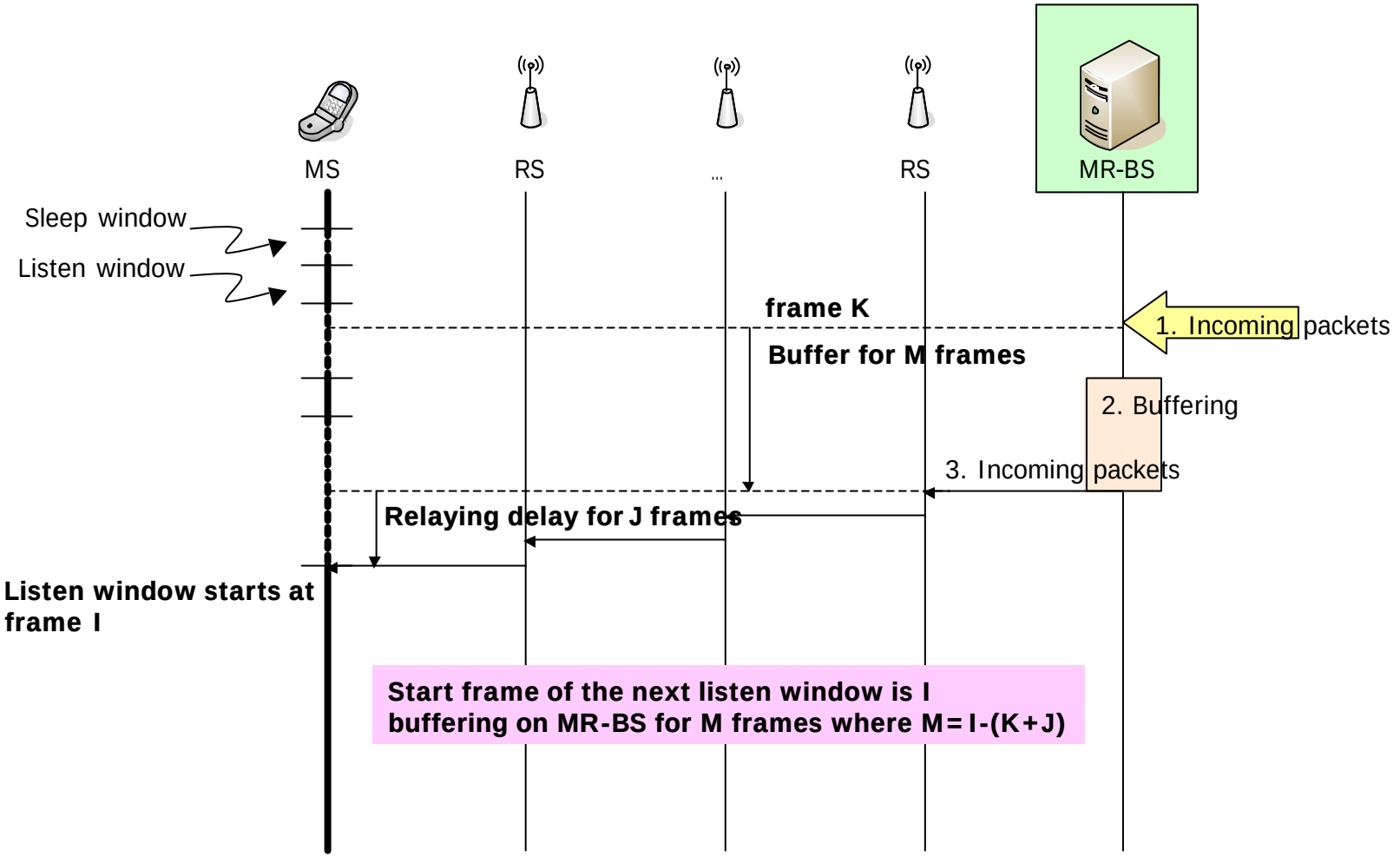

***(power saving class type-1, start frame, initial sleep window, listen window, … )**

# Sleep Mode Operation for IEEE 802.16j

- Admission control and buffering on MR-BS
  - Reuse Sleep Request/Response messages between RSs, and between an RS and an MR-BS
  - Admission control of sleep mode operations on the MR-BS
  - MR-BS must take the relaying delay from the MR-BS to the serving RS into consideration while it forwards incoming packet to the MS via RSs
  - Buffering incoming packets on the MR-BS

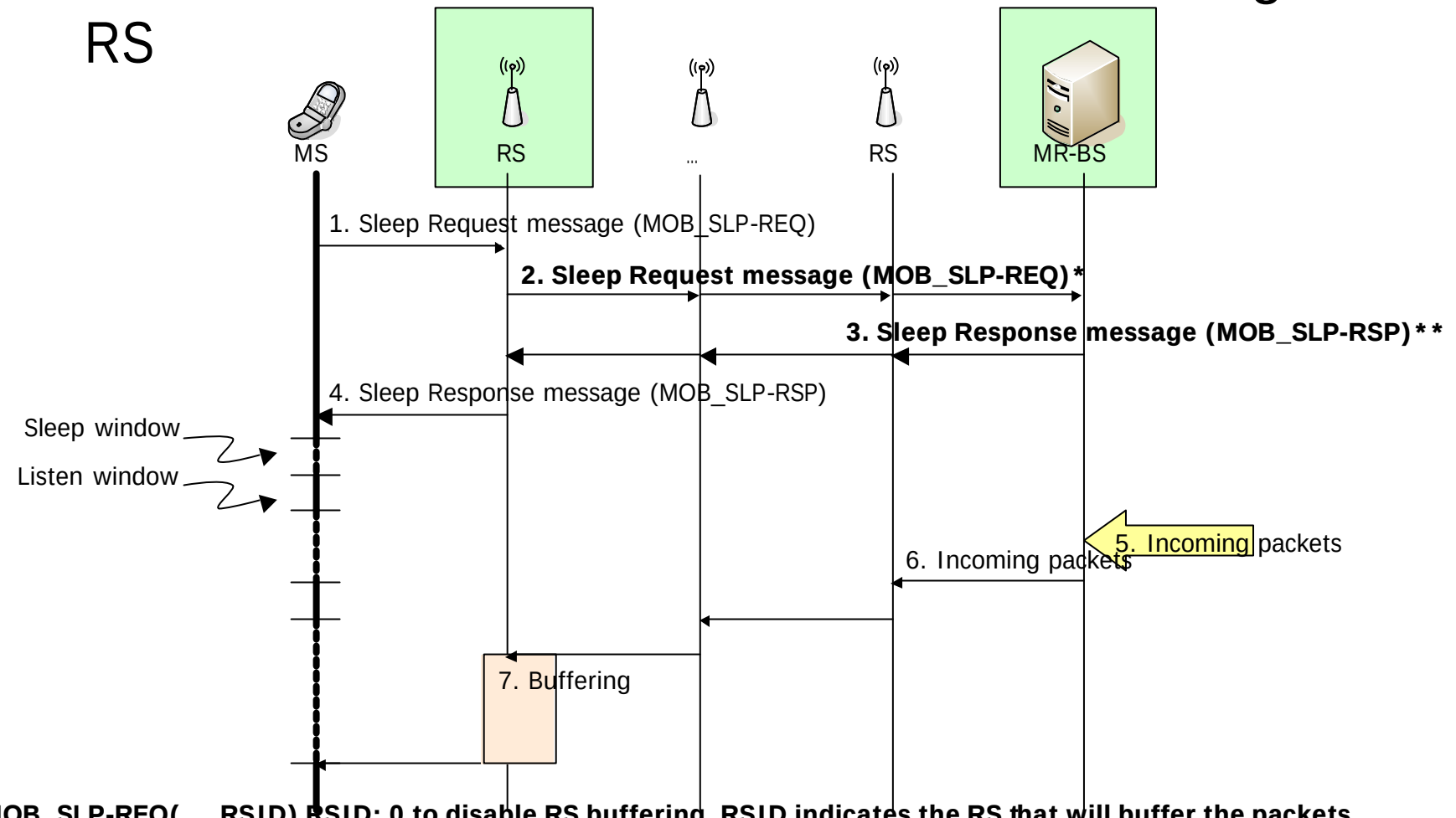
# Sleep Mode Operation for IEEE 802.16j

- Admission control and buffering on MR-BS



# Sleep Mode Operation for IEEE 802.16j

- Admission control on MR-BS/RS and buffering on RS




*** MOB_SLP-REQ(… , RSID) RSID: 0 to disable RS buffering, RSID indicates the RS that will buffer the packets**

**** MOB_SLP-RSP(… , RSID) RSID: 0 to disable RS buffering, the MR-BS acknowledges the RS for packet buffering**

*** parameters such as start frame, initial sleep window, listen window, and etc may be modified by the RS**

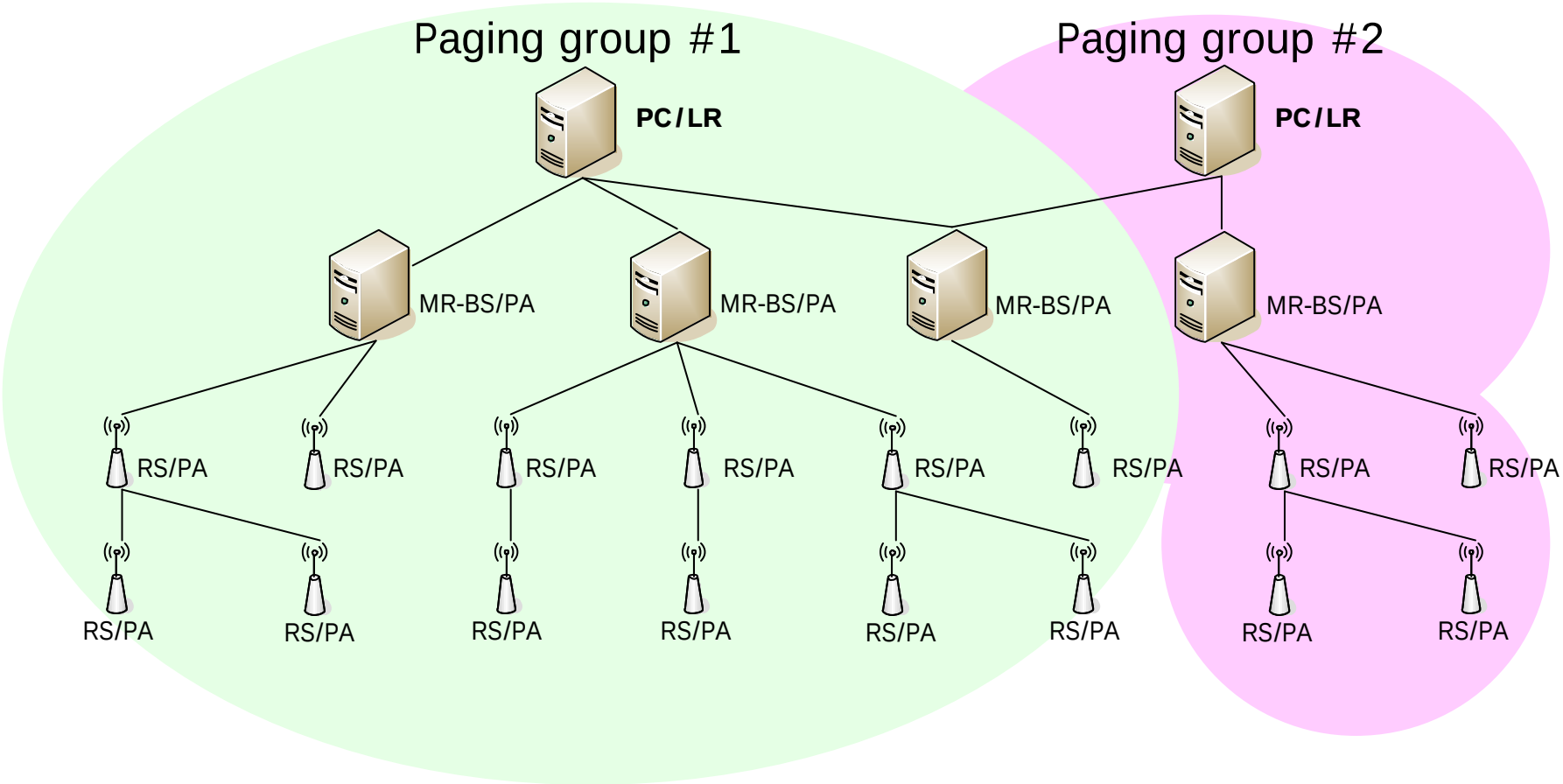
# Sleep Mode Operation for IEEE 802.16j

- Admission control on MR-BS/RS and buffering on RS
  - Reuse Sleep Request/Response messages between RSs, and between an RS and an MR-BS
    - New parameter of MOB_SLP-REQ/MOB_SLP-RSP: RSID
  - Admission control of sleep mode operations on the MR-BS/RS, sleep-mode parameters and state maintained on the MR-BS/RS
  - MR-BS forwards the incoming packets to RSs as soon as it receives the packets
  - Buffering incoming packets on an RS

# Idle Mode Operation for IEEE 802.16j

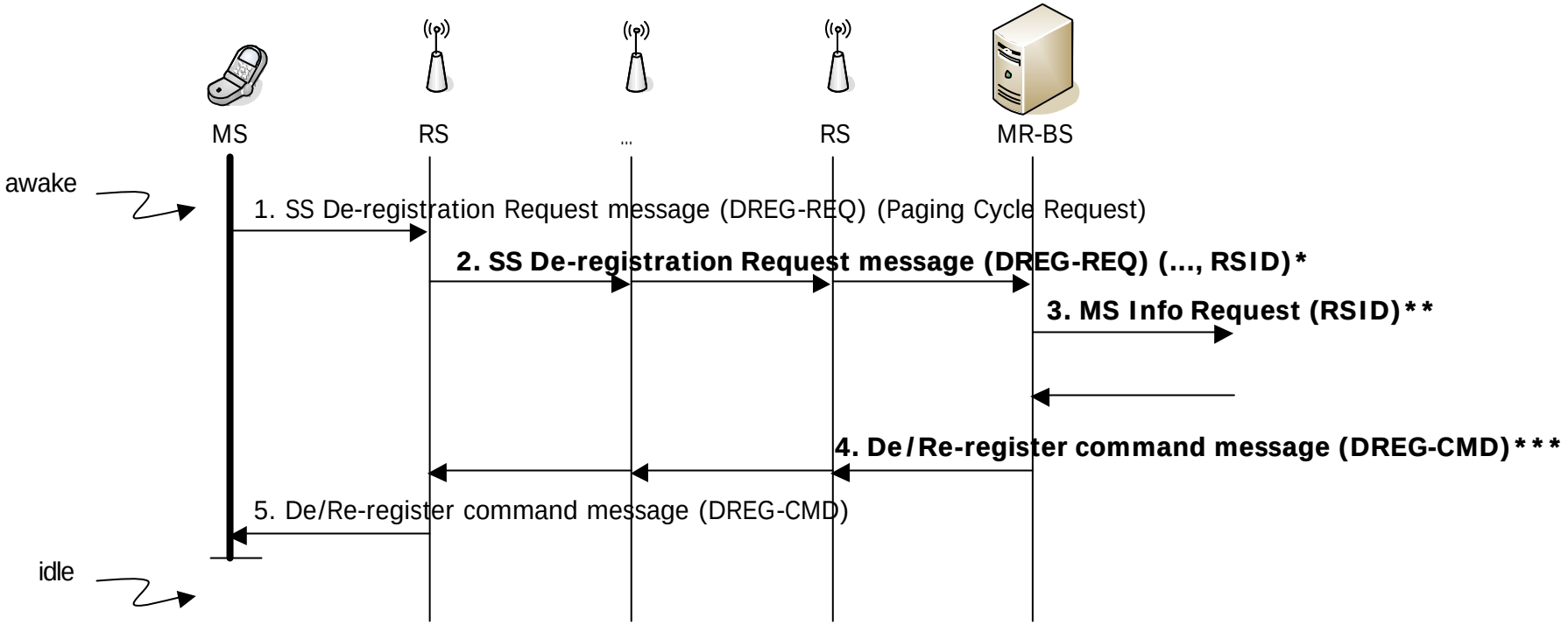
- Definition of paging group in IEEE 802.16j
  - **PC (paging controller):** PC may be either co-located with BS, MR-BS or separated from BS/MR-BS across R6 reference point
  - **PA (paging agent):** PA is co-located with BS, MR-BS or RS
  - **PG (Paging group):** RSs and their associated MR-BS belong to the same paging groups

# Idle Mode Operation for IEEE 802.16j



# Idle Mode Operation for IEEE 802.16j

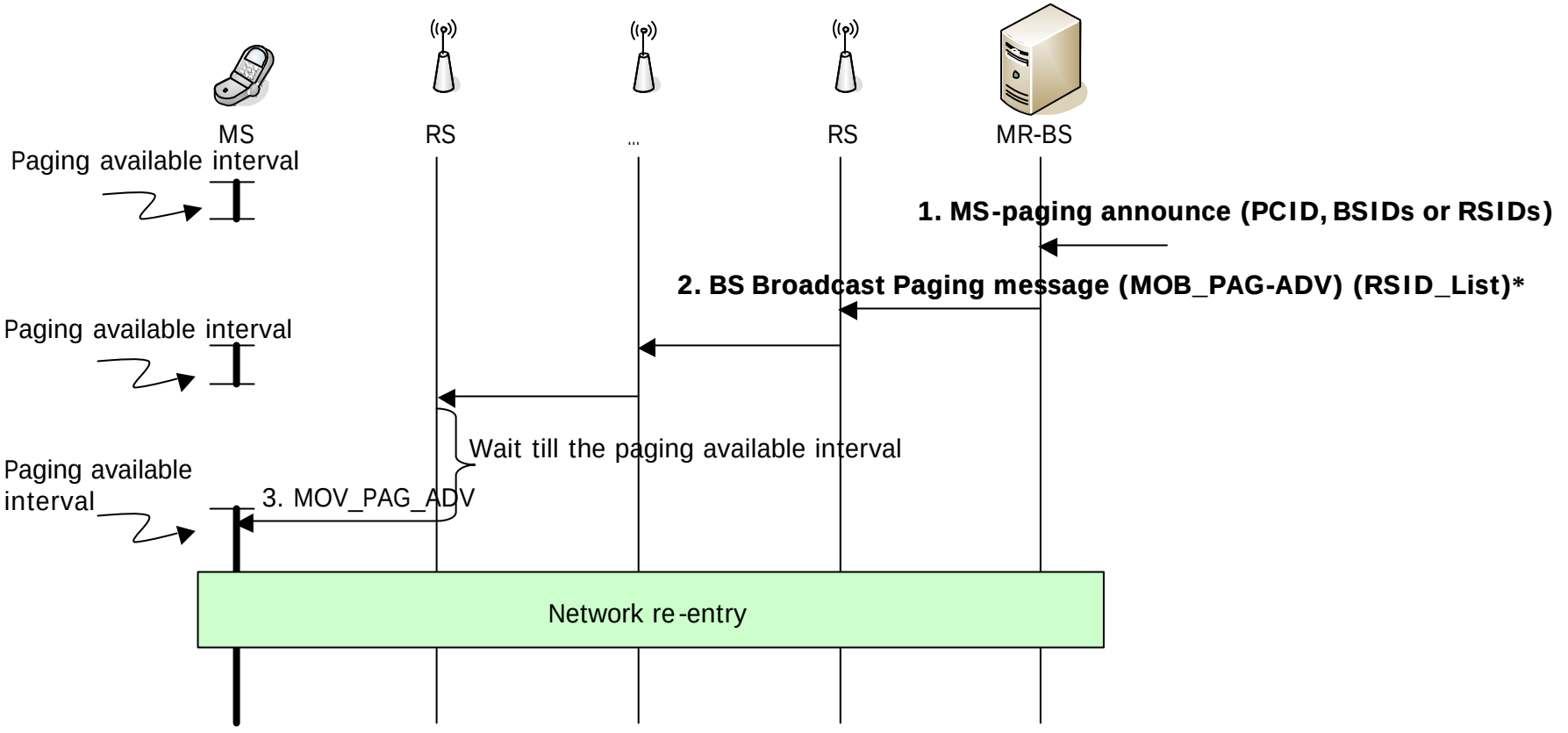
- Enter idle mode




***DREG-REQ(… , RSID) RSID: RSID indicates the serving RS for the mobile who decides to enter idle mode**
****MS Info Request: reports the BSID or RSID to PC/LR**
*****DREG-CMD: both MR-BS/serving RS must store the paging parameters (PAGING_CYCLE/PAGING OFFSET)**

# Idle Mode Operation for IEEE 802.16j

- Paging



# Idle Mode Operation for IEEE 802.16j

- Summary
  - Defines functional entities in the paging architecture in IEEE 802.16j
  - Reuse DREG-REQ/DREG-RSP/MOB_PAG-ADV/RNG-REQ/RNG-RSP messages between RSs, and between an RS and an MR-BS
    - New parameters of DREG-REQ/RSP: RSID
- Future Work
  - Does there exist benefit to page part of RSs within an MR-cell?

# References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- IEEE Standard 802.16e-2005, Air Interface for Fixed and Mobile Broadband Wireless Access Systems; Amendment 2: Physical and Medium Access Control Layers for Combined Fixed and Mobile Operation in Licensed Bands, 2005
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- Harmonized definitions and terminology for 802.16j Mobile Multihop Relay, IEEE 802.16j-06/014r1
- Table of Contents of Task Group Working Document, IEEE 802.16j-06/017r2