Further MR-DC enhancements

- **Introduction**
  - These slides lists topics to be discussed and in some cases possible steps for progress
- **Contents**
  - Efficient SCG (de)activation
    - UE behaviour upon SCG activation indication
    - UE-triggered SCG activation
    - possible next steps
  - CPAC
    - SN-initiated CPC
    - Topics for discussions / possible next steps

Efficient SCG (de)activation

- **UE behaviour upon SCG activation indication**
  - Two candidate solutions
    1. Initiate RACH and then resume L1/L2 activities
    2. Directly start all L1/L2 activities (listen to PDCCH, transmit SR/BSR, etc.)

  - Option 1 is needed anyway and requires some work
    - CBRA or CFRA
    - If CFRA is supported, resources are either
      - indicated by the network in the activation indication; or
      - pre-allocated
    - Note: pre-allocated resources could also be used for UE-initiated RACH if supported

  - Also supporting option 2
    - can reduce activation delay
    - requires some mechanism to ensure successful start of L1/L2 activities
      - uplink timing: this can be judged by the TA timer
      - good enough beams: this can be judged either
        a. before activation (while the SCG is deactivated)
           - using some kind of monitoring by the UE (e.g. RLM/BFD, but that may increase power consumption)
           - and reports (RRM or other) if the network makes the choice
        b. after receiving the SCG activation indication
           - by normal RLM/BFD or
           - by some other faster procedure

Efficient SCG (de)activation

- **Making progress**
  - There is significant support for option 2 but views are split
  - Way forward could be:
    1. work on option 1 details, keep option 2 FFS
    2. agree to support option 2 and select the method how to use it or not:
       a. **based on UE evaluation**
          - upon reception of the activation indication without reconfigurationWithSync while TA timer is running, the UE decides whether to resume L1/L2 operation without RACH
          - FFS if any UE requirements are specified to ensure beams are good enough
          - FFS RACH resources if the UE decides to use RACH
       b. **based on network indication**
          - the UE shall resume L1/L2 operation without RACH if instructed to do so in the activation indication
          - FFS if any optimisation to help the network decide which option to chose
    3. other?
  - Rapporteur suggestion
    - deprioritise option 2 if 2a or 2b (possibly reworded) cannot be agreed at next meeting

Efficient SCG (de)activation

- **UE-triggered SCG activation**
  - Cases
    - This is needed for uplink data arrival on SCG bearers
    - There are proposals to use it for other cases, but this is debatable
  - Two candidate solutions
    1. Indication to the MCG, then MN initiates activation
    2. Direct access via the SCG
  - Considerations
    - Either option 1 or option 2 or both could be supported
    - Gains
      - Option 2 can be faster than option 1 triggering RACH
      - Option 1 triggering L1/L2 operation without RACH can be faster than option 2
    - Specification work
      - Option 1: details for indication (baseline can be “I have uplink data for an SCG bearer”)
      - Option 2: limited in RAN2 but requires RAN3 work for MN-SN interaction
      - both: needs configuration, possibly per trigger if several triggers are supported

Efficient SCG (de)activation

- **Making progress**
  - Agree to support UE-triggered SCG activation for UL data arrival on an SCG bearer and, if option 2 is agreeable, fast MCG link recovery, FFS other triggers
  - Agree option(s) that have significant support for UL data arrival on an SCG bearer and then work on details

CPAC

- **SN-initiated CPC**
  - The minimum interaction is:
    - S-SN (regular info for SN change + list of (PSCell, execution condition) -> MN (regular info for SN change + list of PSCell) (FFS execution condition)-> T-SN
    - T-SN (regular info for SN change + list of (PSCell, conditional configurations) -> MN -> UE
  - Further enhancements are suggested
    1. T-SN can add PSCell not proposed by S-SN (feasible by 2 more steps)
    2. S-SN can change gap configuration after T-SN response (feasibility is unclear)
  - Open issues
    - SgNB/SN change confirm (could be decided by RAN3)
    - Inter-node messages are not designed for multiple targets
    - what happens at a later S-SN modification (could be decided by RAN3)
    - Can T-SN change or release some configurations? (if yes, RAN3 need to work on details)

CPAC

- **Topics to be considered**
  - Design of inter-node messages in RAN2
  - Discuss whether T-SN can add PSCell not proposed by S-SN
    - if yes, how to do it
  - How to avoid that the UE does useless measurements (e.g. if a PSCell is not prepared)?
    - do we need to modify the configuration for that (by the network or by the UE)?
    - or can the UE not measure things when it is not required to do anything with the result anyway?
  - Change S-MN/SN gap configuration after conditional configurations were prepared
    - this requires coordination with the MN
    - it may require informing (all) candidate target SN(s)
    - suggestion
      - progress on SN modification after CPC configuration
      - then assess the gain vs. complexity of modifying the CPC preparation for gap modification
  - Discuss whether T-SN can change or release some configurations
    - if yes, RAN3 needs to design the solution
  - (Leave SgNB/SN modification confirm to RAN3?)