

5.4.4 Scheduling Request

The Scheduling Request (SR) is used for requesting UL-SCH resources for new transmission.

The MAC entity may be configured with zero, one, or more SR configurations. An SR configuration consists of a set of PUCCH resources for SR across different BWPs and cells. For a logical channel, at most one PUCCH resource for SR is configured per BWP.

Each SR configuration corresponds to one or more logical channels. Each logical channel may be mapped to zero or one SR configuration, which is configured by RRC. The SR configuration of the logical channel that triggered the BSR (subclause 5.4.5) (if such a configuration exists) is considered as corresponding SR configuration for the triggered SR.

RRC configures the following parameters for the scheduling request procedure:

- *sr-ProhibitTimer* (per SR configuration);
- *sr-TransMax* (per SR configuration);
- *sr-ConfigIndex*.

The following UE variables are used for the scheduling request procedure:

- *SR_COUNTER* (per SR configuration).

If an SR is triggered and there are no other SRs pending corresponding to the same SR configuration, the MAC entity shall set the *SR_COUNTER* of the corresponding SR configuration to 0.

When an SR is triggered, it shall be considered as pending until it is cancelled. All pending SR(s) triggered prior to the MAC PDU assembly shall be cancelled and each respective *sr-ProhibitTimer* shall be stopped when the MAC PDU is transmitted and this PDU includes a BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see subclause 5.4.5) prior to the MAC PDU assembly. All pending SR(s) shall be cancelled when the UL grant(s) can accommodate all pending data available for transmission.

Only PUCCH resources on a BWP which is active at the time of SR transmission occasion are considered valid.

As long as at least one SR is pending, the MAC entity shall for each pending SR:

- 1> if the MAC entity has no valid PUCCH resource configured for the pending SR:
 - 2> initiate a Random Access procedure (see subclause 5.1) on the SpCell and cancel the pending SR.
- 1> else, for the SR configuration corresponding to the pending SR:
 - 2> when the MAC entity has an SR transmission occasion on the valid PUCCH resource for SR configured; and
 - 2> if *sr-ProhibitTimer* is not running at the time of the SR transmission occasion; and
 - 2> if the PUCCH resource for the SR transmission occasion does not overlap with a measurement gap; and
 - 2> if the PUCCH resource for the SR transmission occasion does not overlap with a UL-SCH resource:
 - 3> if *SR_COUNTER* < *sr-TransMax*:
 - 4> increment *SR_COUNTER* by 1;
 - 4> instruct the physical layer to signal the SR on one valid PUCCH resource for SR;
 - 4> start the *sr-ProhibitTimer*.
 - 3> else:

- 4> notify RRC to release PUCCH for all Serving Cells;
- 4> notify RRC to release SRS for all Serving Cells;
- 4> clear any configured downlink assignments and uplink grants;
- 4> initiate a Random Access procedure (see subclause 5.1) on the SpCell and cancel all pending SRs.

NOTE: The selection of which valid PUCCH resource for SR to signal SR on when the MAC entity has more than one overlapping valid PUCCH resource for the SR transmission occasion is left to UE implementation.

The MAC entity may stop, if any, ongoing Random Access procedure due to a pending SR which has no valid PUCCH resources configured, which was initiated by MAC entity prior to the MAC PDU assembly. Such a Random Access procedure may be stopped when the MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response, and this PDU includes a BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see subclause 5.4.5) prior to the MAC PDU assembly, or when the UL grant(s) can accommodate all pending data available for transmission.