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E-UTRAN Connectivity Procedures

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Introduction

- E-UTRA connectivity procedures should support packet-switched traffic efficiently and reduce signalling and first-packet delays
  - Signalling delays can be reduced with default and/or predetermined parameter configurations for data transmission
  - For services without specific QoS needs (e.g. no minimum bitrate) default and/or predetermined parameter configurations reduce also first packet delays, as no admission control is necessary
  - For services with specific QoS needs, first-packet delays can be reduced by enabling data transmission already while the required QoS is being configured
- In this contribution, we
  - propose improved connectivity procedures that provide the above features through Radio Link Service Profile (RLSP) and Logical Channel ID (LCID)
  - give a high level view of the proposed connectivity procedures and illustrate how signaling and first packet delays are reduced with the given approach

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Radio Link Service Profile (RLSP)

- *Radio link service profile* (RLSP)
  - determines how the packet is handled at the radio link layer and what is the required QoS
    - consists of the L2 QoS parameters that determine packet handling (both the transmitter and the receiver).
  - Is signalled between peer RRC protocols, when necessary (see customized RLSP)
- Radio link service profile can be either default, preconfigured or customized
  - **Default** RLSPs are specified in the specification for different logical channels.
  - **Preconfigured** RLSP is defined locally. Any number of preconfigured RLSPs may exist but they all have a unique reserved RLSP identity. The preconfiguration can occur either in the subscription phase (e.g. SIM-based preconfiguration) or at the initial access phase.
    - A specific RRC procedure is used to associate a given preconfigured RLSP to a logical channel at the RRC peer entity.
  - **Customized** RLSP is defined locally at the originating entity (UE or BS) and its creation is communicated with peer to peer RRC signaling which contains full description of the customized RLSP.
    - Same as UTRAN Radio Bearer Setup

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Logical channel Identifier (LCID)

- *Logical channel ID (LCID)* defines the logical channel type and instance (=TCFT+C/T)
- The LCID can be default, unregistered or registered
  - Note that three types of LCIDs and three types of RLSPs do not correspond to each other one-by-one.
  - **Default** LCID: Every default LCID is mapped to a default RLSP. This mapping is generated in both UE and BS when the default RLSP is generated in the system, and cannot be reconfigured during the session Thus, the default LCID can only be used for the flows which do not require any reconfiguration of RLSP.
  - **Unregistered** LCID: all LCIDs except default LCIDs are unregistered LCID at first. All unregistered LCIDs are mapped onto the same default RLSP that determines their processing. An unregistered LCID may become a registered LCID upon the finalization of the RLSP invocation/creation for that particular LCID
  - **Registered** LCID: After RLSP is invoked or created (via RRC signaling), and the MAC is configured according to the new RLSP, the unregistered LCID becomes a registered LCID on both UE and BS sides. Further reconfiguration via the RRC signaling is also possible.
  - Each registered LCID have one pre-configured or customized RLSP. If necessary it is also possible to configure the default RLSP to registered LCIDs.
- By using unregistered/registered LCIDs, logical channel can be used to start transmitting data (with default QoS parameters) during the time while the RRC signaling to create optimized parameter configuration is still ongoing

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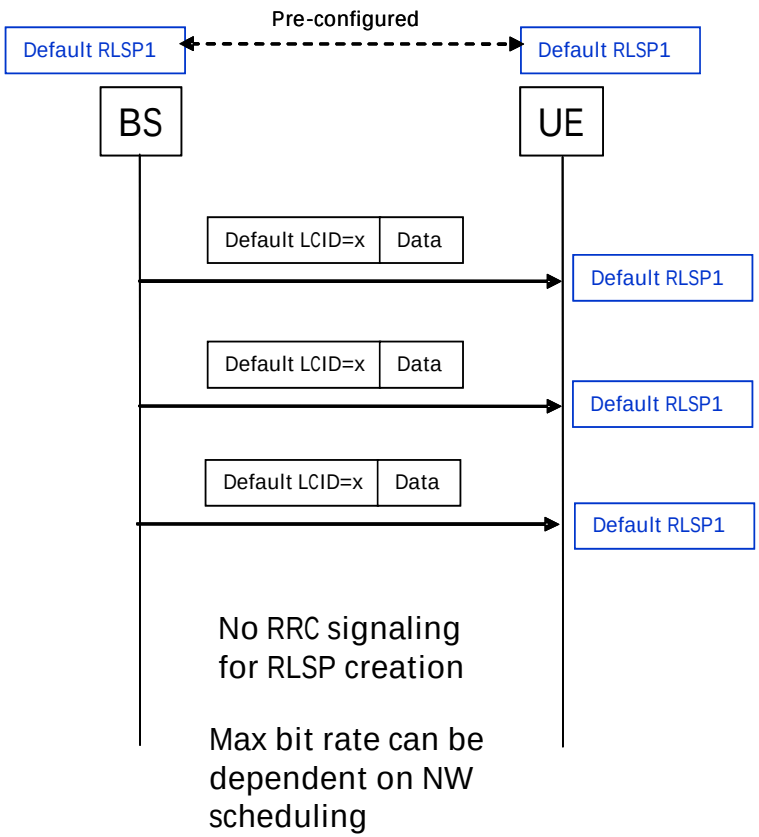
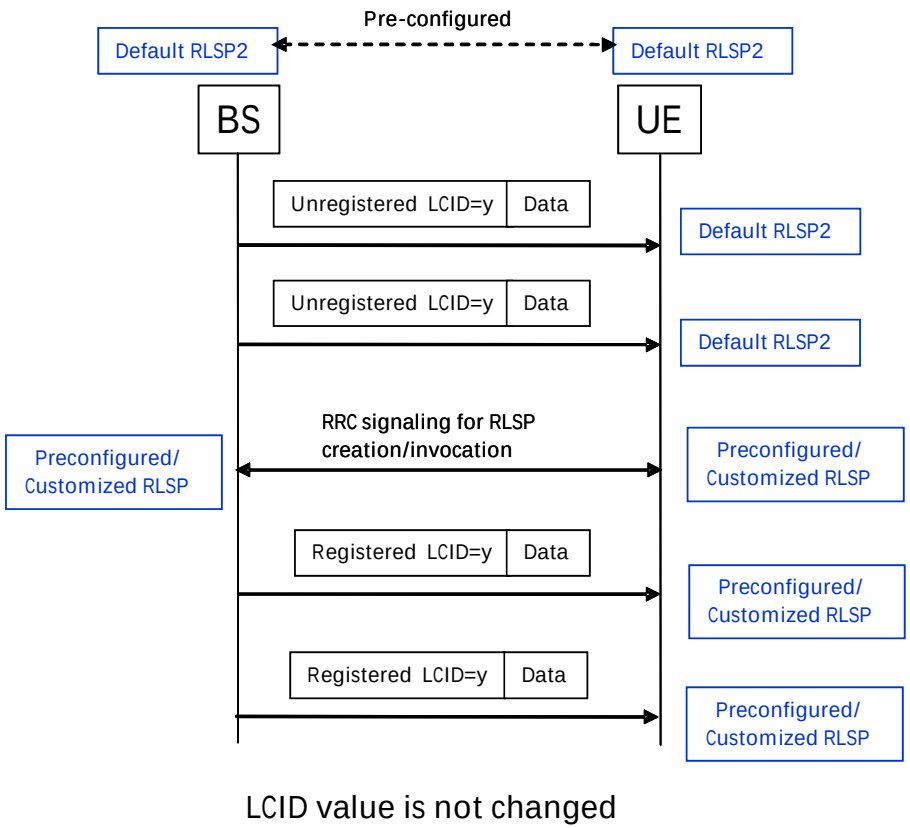
Example of the use of LCIDs

Case 1:(e.g. RRC signaling):



UE knows how to process data from the pre-configured association of default LCID to default RLSP1.

Case 2:



UE knows how to process data from the pre-configured association of unregistered LCID to default RLSP2, and then the configured association of registered LCID to preconfigured/customize RLSP

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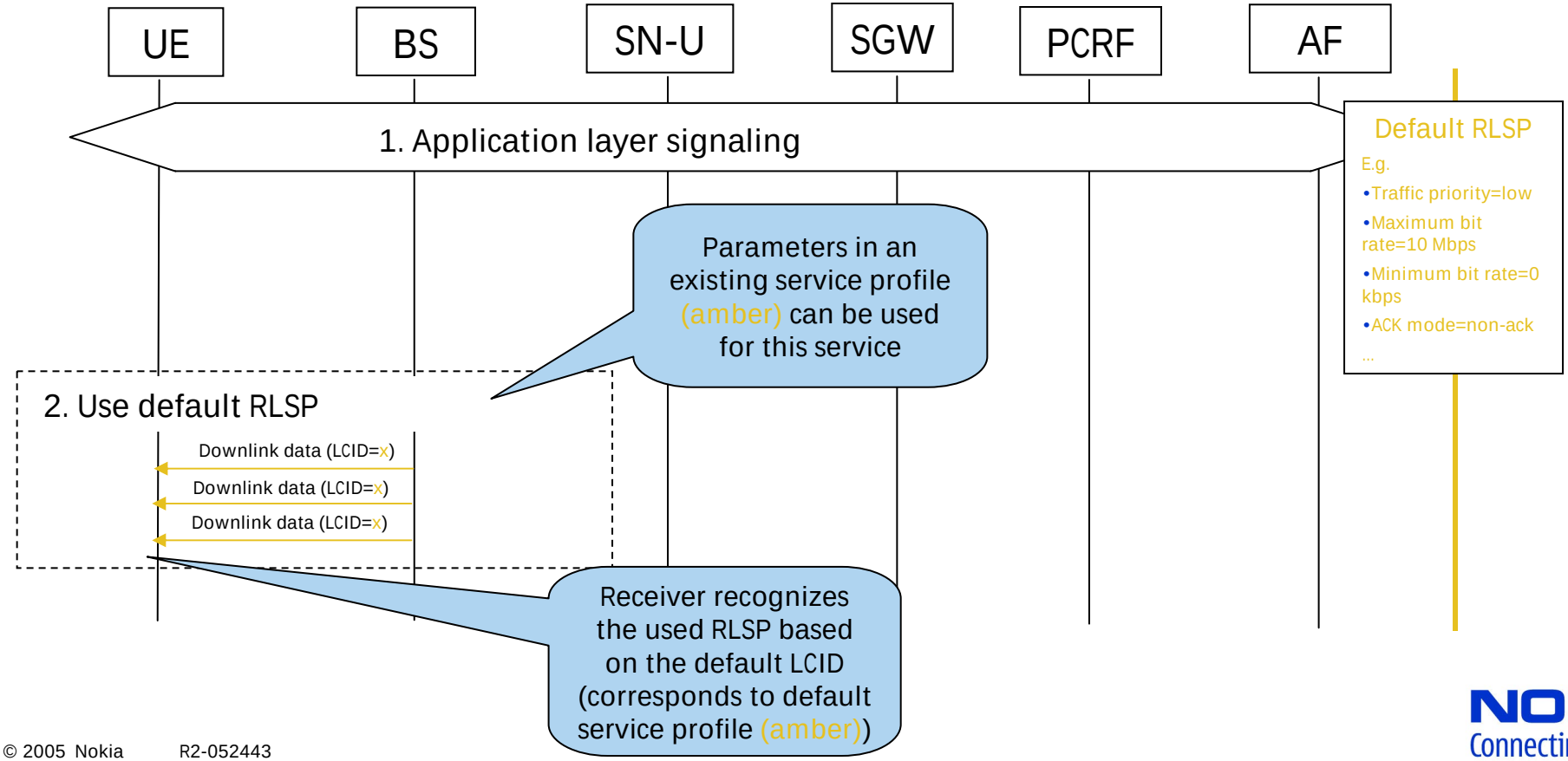
Connectivity Procedure example with generic QoS

- Procedure for services that do not require custom QoS
  - Suitable unregistered LCID is used



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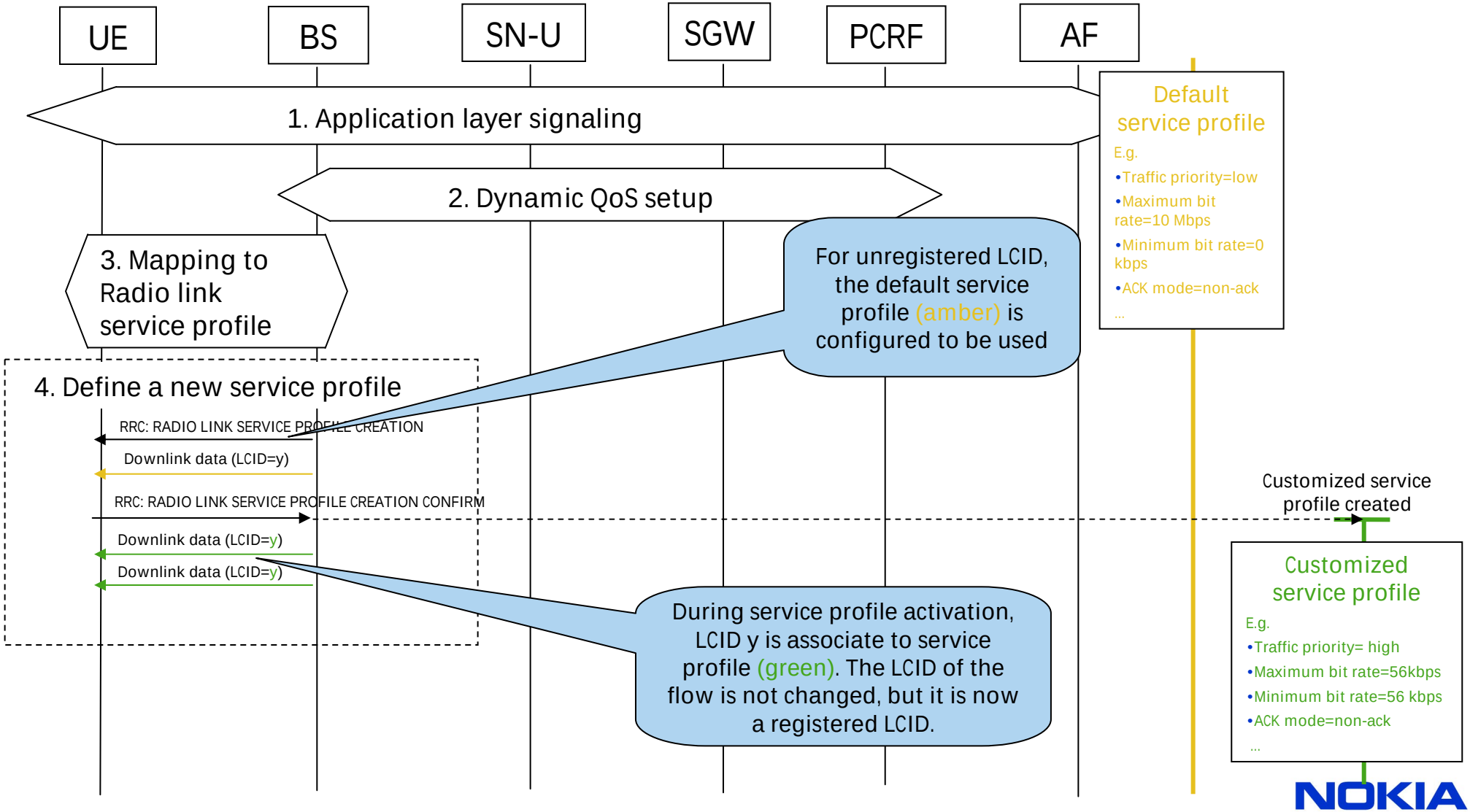
Connectivity Procedure example with service-specific QoS



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