

5G NR: Radio
Access
Networks

RANDOM ACCESS

Random Access Procedure

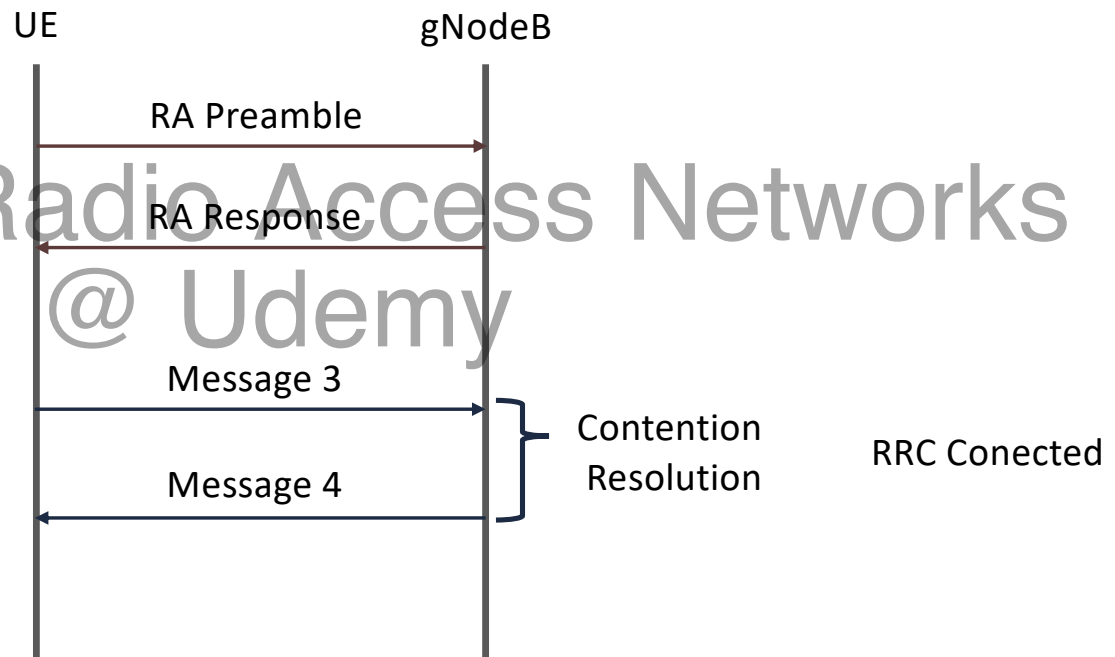
Triggers:

- RRC Idle to RRC Connected
- Uplink data
- Sync lost
- Sync during Handover

© 5G NR Handover Success Networks @ Ucdemy

CONTENTION BASED RANDOM ACCESS (CBRA)

CBRA



Step 1: Random Access Preamble (PRACH)



Preamble: Hi, I'd like to access the network
(Random preamble from a pool)

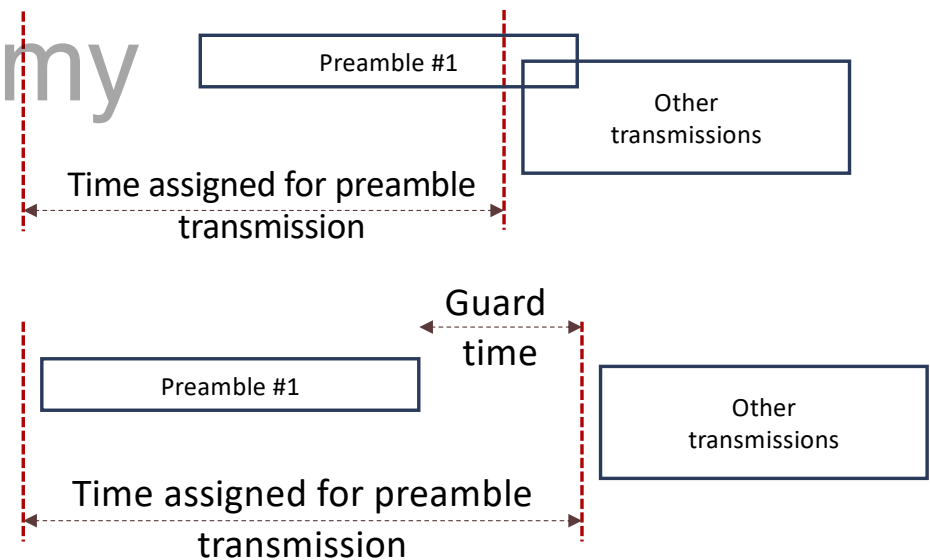


Timing Adjustment

- Estimate based on SS Block

Power Control

- Estimate based on SS Block
- Power Ramping



Step 2: Random Access Response (RAR)

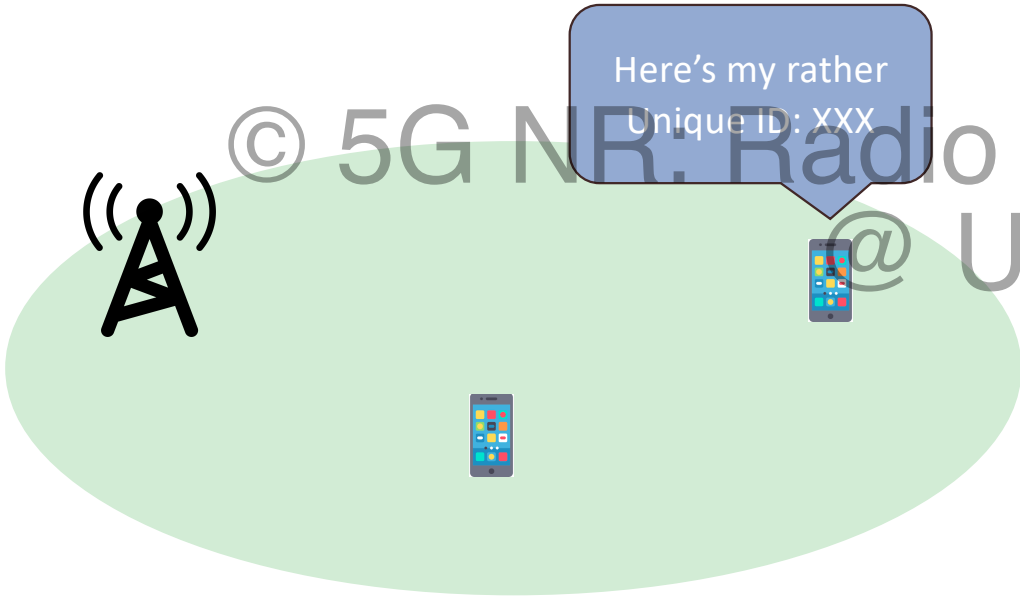
RAR: Hi, I heard you
Mr.Preamble#1. Here is
a temp ID and uplink
resources for you



Random Access Response

- Address: Random Access Preamble Identifier
- Timing correction
- Scheduling Grant (RARG)
- TC-RNTI

Step 3: Scheduled Transmission / Contention Resolution



Here's my rather
Unique ID: XXX

Only device – No collision

Two simultaneous Random Access

- Different Preamble -> Different TC-RNTI
- Same preamble -> TC-RNTI

RRC Connection Setup Request

- UE Contention Resolution Identity
- C-RNTI

Step 4: Contention Resolution and Connection Setup



© 5G NR Machine Type Communications Networks
@_Odemy

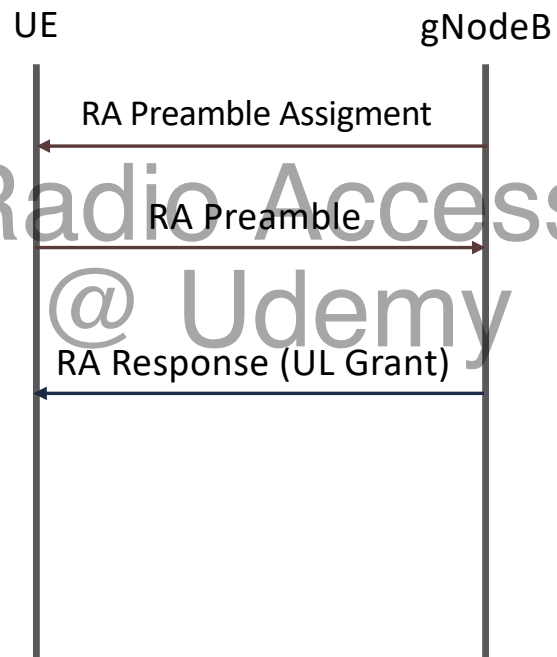
CONTENTION FREE RANDOM ACCESS (CFRA)

CFRA

Triggers:

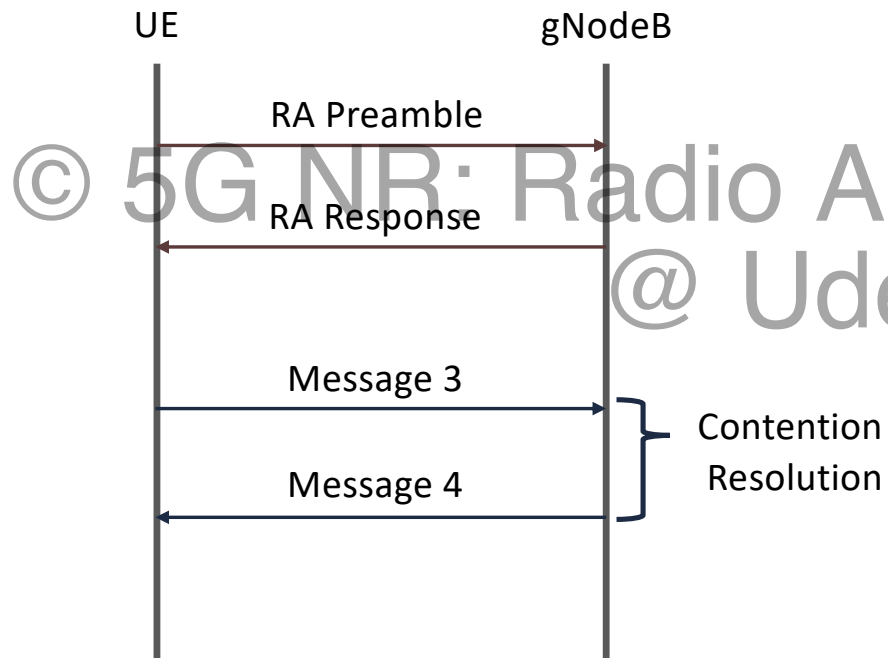
- Handover
- DL data for UE
- Non-stand alone mode, NR cell

CFRA

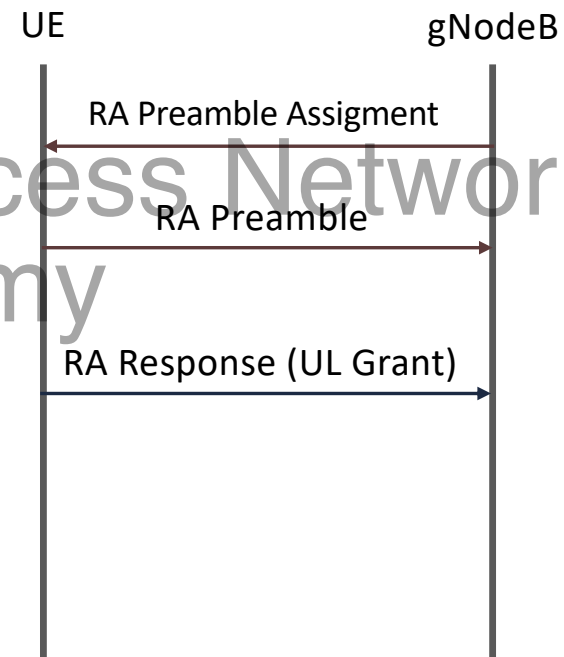


Summary

CBRA



CFRA



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THANK YOU
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