

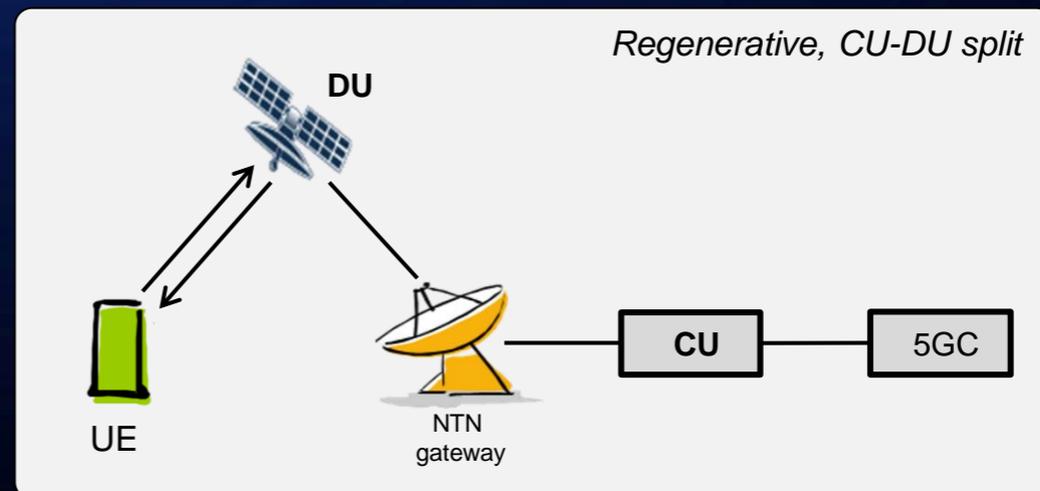
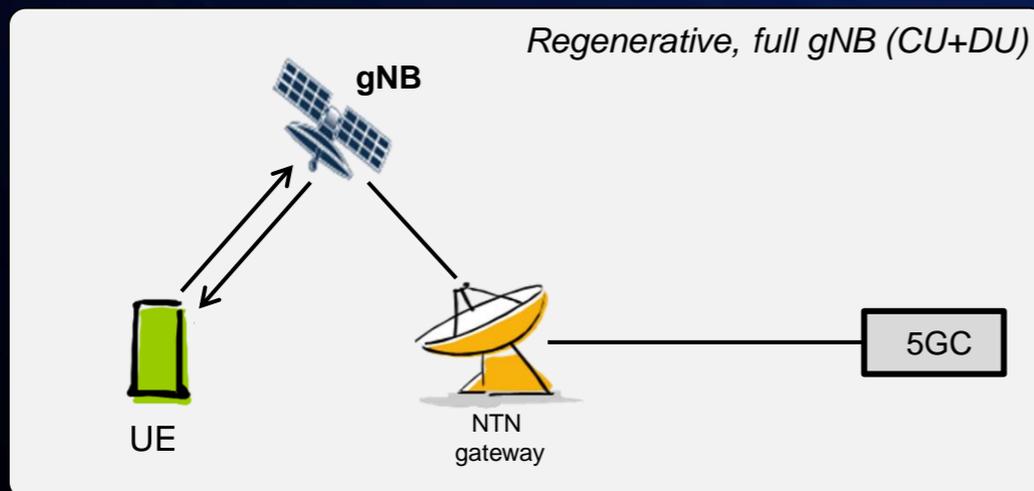
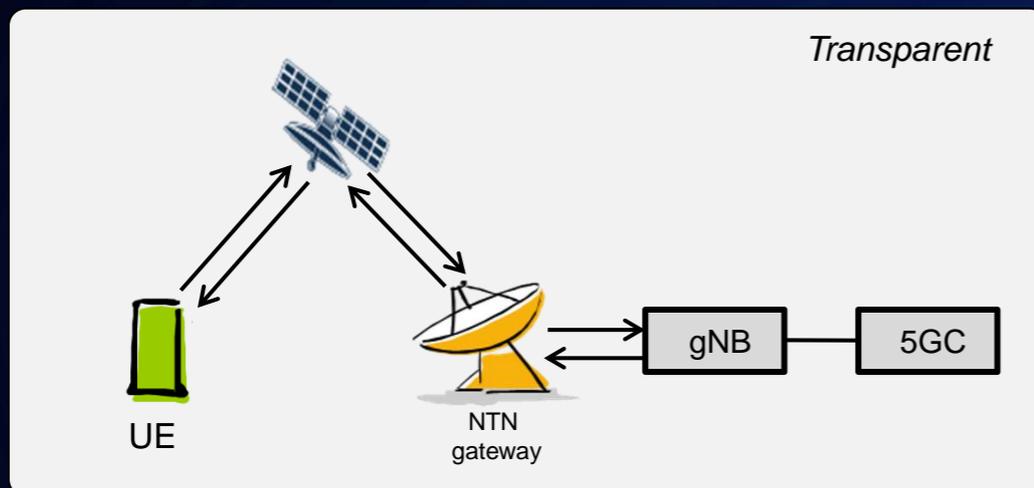
# Views on NTN evolution for Rel-19



# Regenerative Payload

- **Support regenerative payload with no preference on full gNB or CU-DU split**

- Thanks to the shorter UE-gNB distance, the delay between UE and gNB (i.e., NR Uu) is reduced compared with that using transparent payload.
- Regenerative payload would be much effective when the NTN gateway is located very far from the satellite.



# High-Power UE (HPUE)

- **Support HPUE for NTN coverage enhancement, at least in emergency scenarios**
  - Handheld UE with practical antenna gain of -5.5 dBi may suffer from link budget deficiency.
  - HPUE with pre-defined UE Power Classes (e.g., support of PC1.5 and PC1) can be considered.
- **NTN coexistence with terrestrial network in the presence of HPUE**
  - The NTN UL TPC model<sup>TR 38.863</sup> with HPUE can be studied to secure UL link budget while preventing harmful interference with TN.
  - The TPC model with Power Class 3 UE ( $P_{max} = 23$  dBm)

$$P_t = P_{max} \times \min \left\{ 1, \max \left\{ R_{min}, \left( \frac{CL}{CL_{x-ile}} \right)^\gamma \right\} \right\}$$

- $P_{max} = 23$  dBm
- $R_{min} = \text{TBD dB}$
- $CL_{x-ile} = 88 + 10 \log_{10}(200/X) + 1 - Y$  where  $X$  is UL transmission BW (MHz) and  $Y$  is the BS noise figure.
- $\gamma = 1$  for UL scenario

# Mobility Enhancements

- **Continuous NTN mobility enhancement considering TN/NTN seamless mobility and satellite switch with re-sync**
  - Seamless connectivity in TN/NTN is crucial for a great user experience for mobile users, and thus, **enhancing mobility should constantly be in the scope of NTN evolution.**
  - Mobility enhancements including **TN-NTN reselection and satellite switch with re-sync** should be considered if not finalized in Rel-18.

# Conclusion

- **Potential objectives for Rel-19 NTN evolution**
- **Objective 1: Support regenerative payload with no preference on full gNB or CU-DU split**
- **Objective 2: Support HPUE for NTN coverage enhancement, at least in emergency scenarios**
- **Objective 3: NTN coexistence with terrestrial network in the presence of HPUE**
- **Objective 4: Continuous NTN mobility enhancement considering TN/NTN seamless mobility and satellite switch with re-sync**