



Discussion on Satellite Communication Enhancement for Rel-19

Xiaomi

mao.yuxin1@xiaomi.com



Satellite Scenario and Gap Analysis

➤ One of 5G-Advanced targets is to provide ubiquitous mobile network access

➤ **Satellite access deployment scenarios**

- Satellite access can act as supplement to terrestrial access to provide coverage to areas like oceans, deserts, mountains, etc., since extremely expensive to build and maintain terrestrial network in such areas
- Satellite access can replace ground access when disaster happens

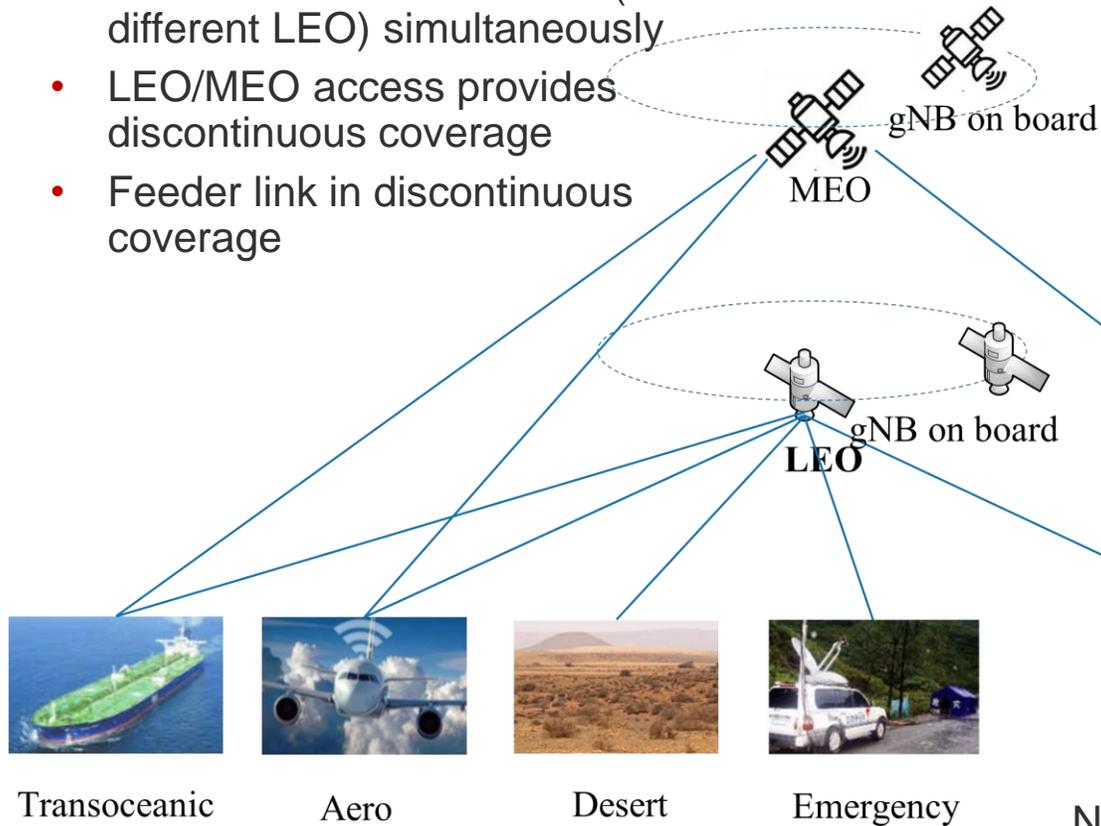
➤ **Gap analysis**

- Bandwidth of satellite access is limited which may be difficult to meet the bandwidth requirements of some services (e.g. remote video surveillance)
- Service continuity is impacted due to discontinuous coverage caused by sparse constellation or intermittent beams
- UL data can't be transmitted to 5GC on the ground over the satellite access because of the unavailability of the feeder link between satellite and its ground gateway.

Enhanced Satellite Network

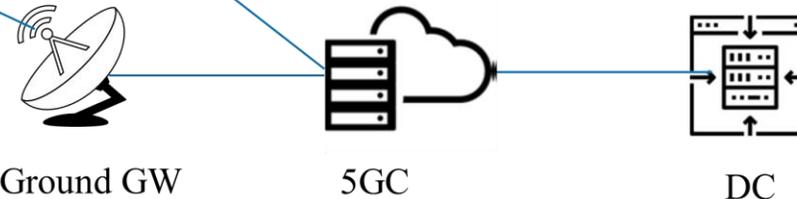
Deployment Scenario:

- UE accesses LEO & MEO (or two different LEO) simultaneously
- LEO/MEO access provides discontinuous coverage
- Feeder link in discontinuous coverage



Requirements:

- Expending bandwidth through multi satellite access, e.g. one application traffic can be carried by both LEO& MEO access
- Applications can select different type of satellite accesses based on their delay or bandwidth requirements.
- Data flows can be handed over between LEO and MEO due to LEO discontinuous coverage to ensure service continuity
- gNB stores data received from UE at given area and sends it later to core network when connection to the GTW/ground station becomes available.



NOTE: the first three requirements can consider ATSSS architecture as baseline, and aim to enhance its support to dual 3GPP access 3

What can we benefit from enhanced satellite network



- Making services with high bandwidth requirement available through multi satellite access
- Mitigate satellite traffic load through traffic balance between different types of satellite network
- Supporting service continuity by complementary coverage with multi satellite access
- IoT service, e.g. IoT data transmit between transoceanic ships and terrestrial center can be achieved based on the gNB store and forward capability