Discussion on Distributed Customization Network Services

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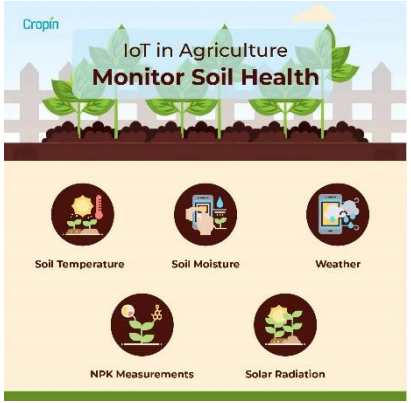
Background and Motivation

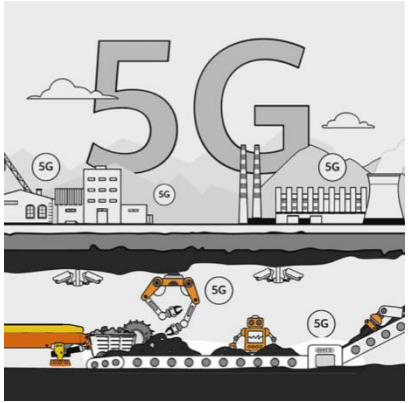
- Emerging new use cases put forward differentiated requirements for network functionality and performance.
- 5G networks are becoming **increasingly complex**, and it is inefficient to provide differentiated services through a **unified complex network**.
- To better address differentiated requirements, improve network resource efficiency, and reduce network construction, deployment, and maintenance costs, there is a need for the 3GPP network to **support on-demand customization**.

Use Case



Extremely low-data-rate IoT

- Small data transmission can be done with control plane, **making user plane unnecessary.**



Mining

- Digging machines and sensors do not move, rendering **mobility management services in control plane unnecessary.**

Non-terrestrial core network

- Considering the limited capacity and storage resources of satellites, **network simplification (e.g. simplifying policy control) and the collaboration with ground core network** are required.

-> Distributed, customized networks with only the necessary services required by users or enterprises are desired.

Figure source from left to right: 1: https://www.cropin.com/blogs/iot-in-agriculture-for-healthier-fertile-soil 2: https://www.gsma.com/5ghub/5gmining 3: https://inews.gtimg.com/newsapp_bt/0/14297848664/641

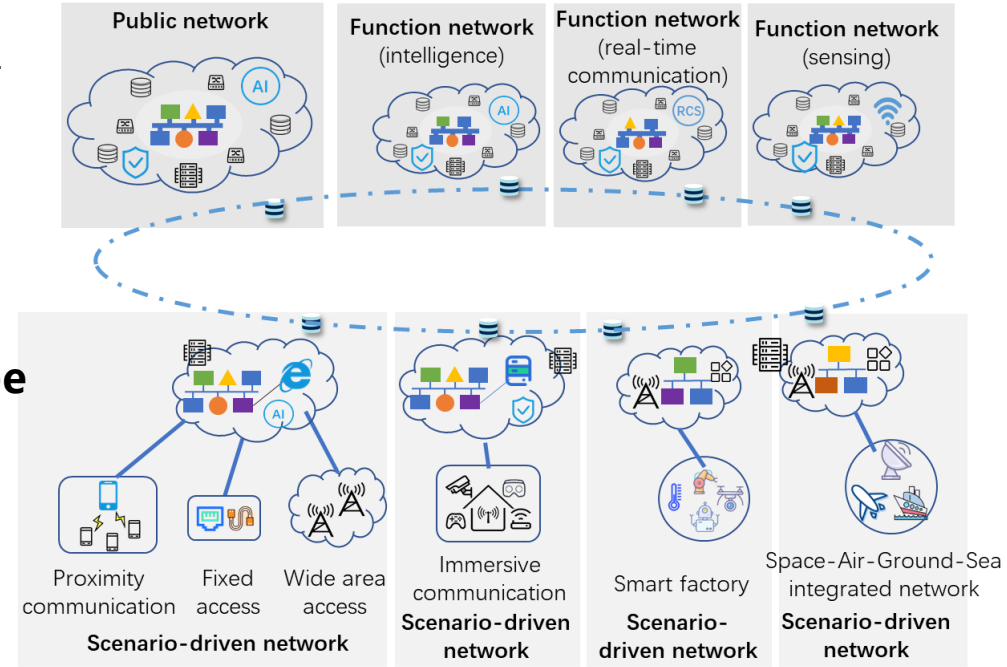
Gap analysis

☹ Network customization today

- a network slice or NPN has to be a complete logical network, comprising of all network functions and NF services, configured end-to-end
- enable customization through allocating dedicated resources. For example, deploying dedicated UPF in campus for low latency

☺ Distributed, customized network will be

- customized with only the essential network functions needed for delivering the services required by users or enterprises
- system procedures execute efficiently in the distributed, customized, logically incomplete networks
- support the interconnection and collaboration of distributed networks



Objective

The main objectives of this study include:

- Studying use cases on distributed, customized network services, and grouping use cases with common characteristics, e.g. network functionality and performance.
- Support of distributed, customized network services.
- Support of the interconnection and collaboration of distributed, customized networks.
- Investigating gaps between the identified new potential requirements and the requirements already specified for the 5G system.
- Other aspects, including privacy, charging and security requirements.

THANKS