

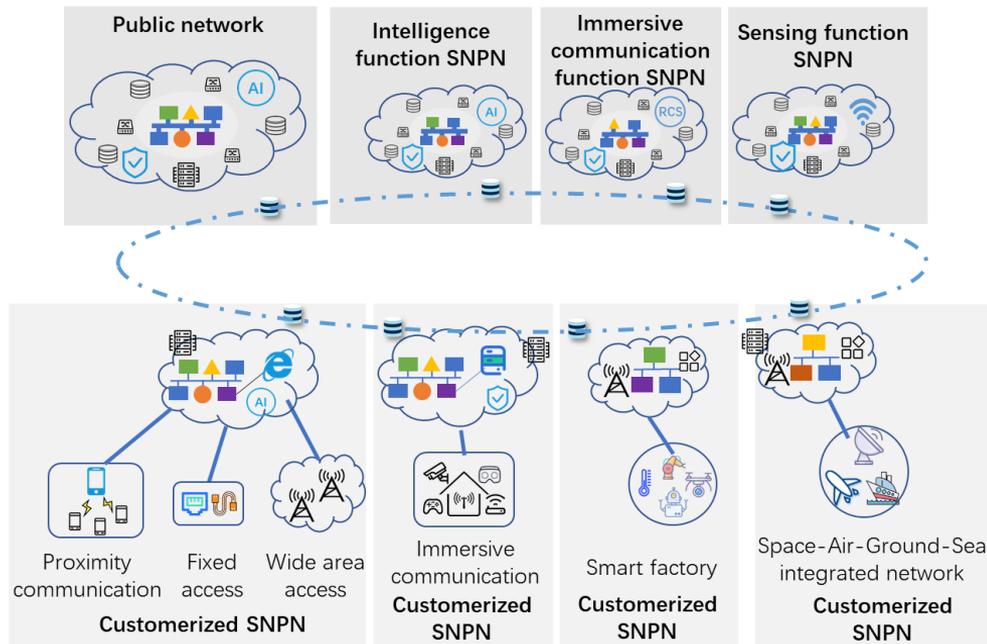
Discussion on Distributed Customization Network Services

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Background and Motivation

- 5G networks are becoming increasingly complex, and it is inefficient to provide differentiated services through a **unified complex network**.
- Due to the isolated operation of the SNPN from the public network, its deployment can be flexible and efficient.
- It is proposed to leverage SNPN for delivering services with selected or higher service requirements.
- One public network owned by the public network operator providing basic connectivity services and multiple customized SNPNs providing differentiated services owned by the public network operator and/or enterprises form a **distributed network**.



Use Case and Gap Analysis (1/2)

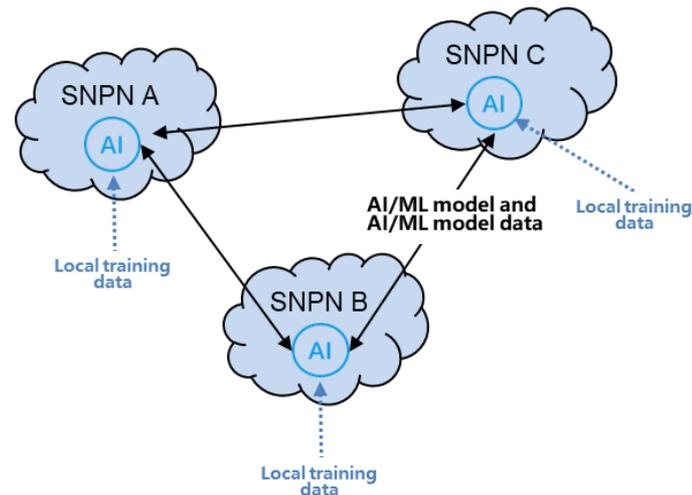
The collaboration of networks within a distributed network can improve **network service capability**:

Distributed/federated learning can be performed by multiple SNPNs and PLMN (forming a federated learning group), where local models are trained by each network using the local training data and AI/ML model data transmitted from other networks.

Gap analysis:

Distributed learning split into a group of UEs is supported. AI/ML model transfer between UEs is supported.

However, distributed learning split into networks (PLMN and SNPN) within a distributed network is not supported.



Use Case and Gap Analysis (2/2)

The collaboration of networks within a distributed network can improve **network resilience**:

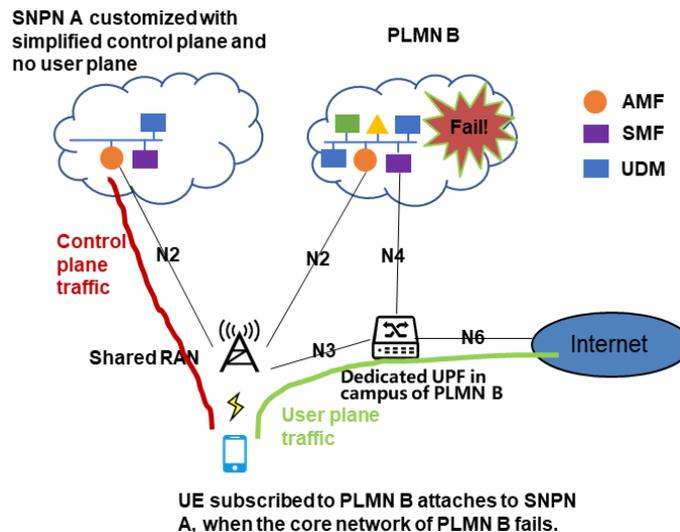
One network within the distributed network fails and its subscribers can receive services from the other networks based on agreements. For example, when the core network of the PLMN fails while its user plane remains functional (due to UPF deployed in a different location closer to users), the user plane of the PLMN can be taken over by the control plane of an SNPN and service continuity can be maintained.

Gap analysis:

For Disaster Roaming with home routing, user plane traffic and associated control plane traffic are routed over both the home and visited networks.

Access to PLMN services via SNPN is supported where users are registered to both the SNPN and the PLMN.

However, network operators cannot route user plane traffic in one network (PLMN B) and associated control plane traffic in another partnership network (SNPN A) for UEs registered with the partnership network.



The main objectives of this study include:

- Support of the collaboration of distributed networks formed by PLMN and customized SNPNs, including disaster relief under network failure, service delivery via multiple networks, activation/de-activation of networks for energy saving, etc.
- 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

