

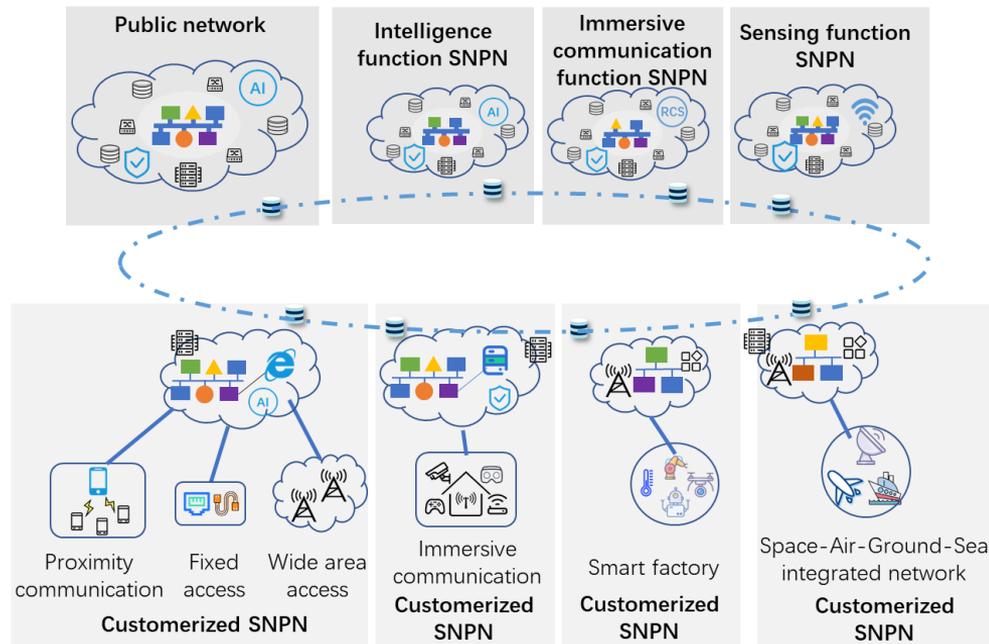
# Discussion on Distributed Customization Network Services

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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)

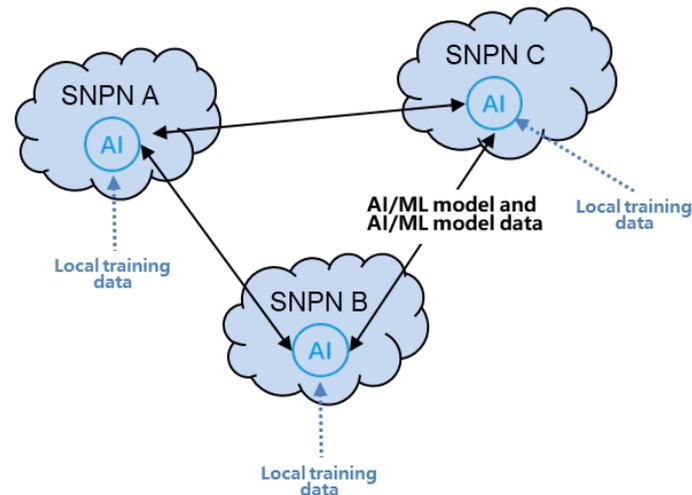
The collaboration of networks within a distributed network can improve **network service capability**:

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. AI/ML model transfer between PLMNs is supported.

However, distributed learning split into networks (PLMN and SNPN) within a distributed network is not supported. AI/ML model transfer between SNPNs is not supported.



# Use Case and Gap Analysis (2/2)

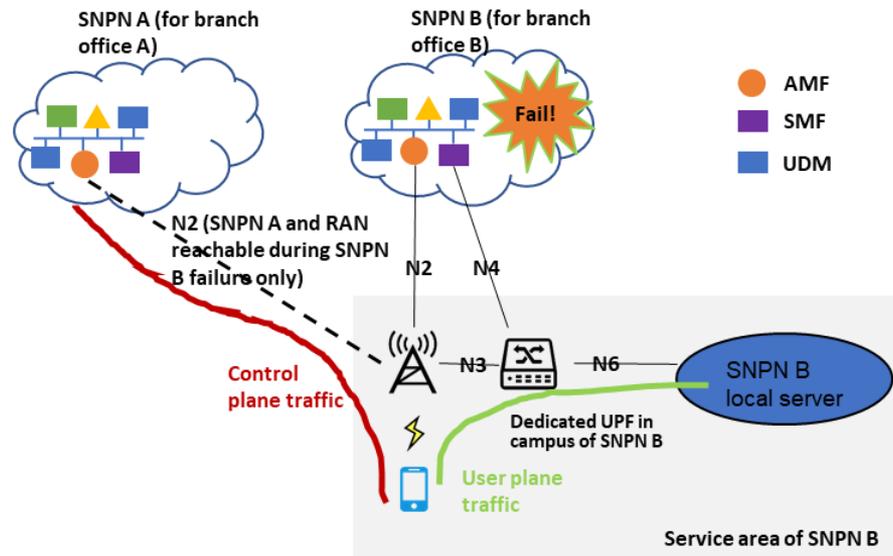
The collaboration of networks within a distributed network can improve **network resilience**:

SNPN A and SNPN B are deployed for two branch offices of the same company. When the control plane of SNPN B fails and its user plane remain functional, SNPN A obtains UE subscription data from the headquarter database and UE subscribed to SNPN B attaches to SNPN A. The user plane traffic remains being routed via SNPN B to SNPN B local server, while the control plane traffic is routed via SNPN A.

## 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.

However, routing user plane traffic in one network (SNPN B) and associated control plane traffic in another partnership network (SNPN A) for UEs registered with the partnership network is not supported.



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

