

5G Testbed for Network Slicing Security Evaluation

Motivation

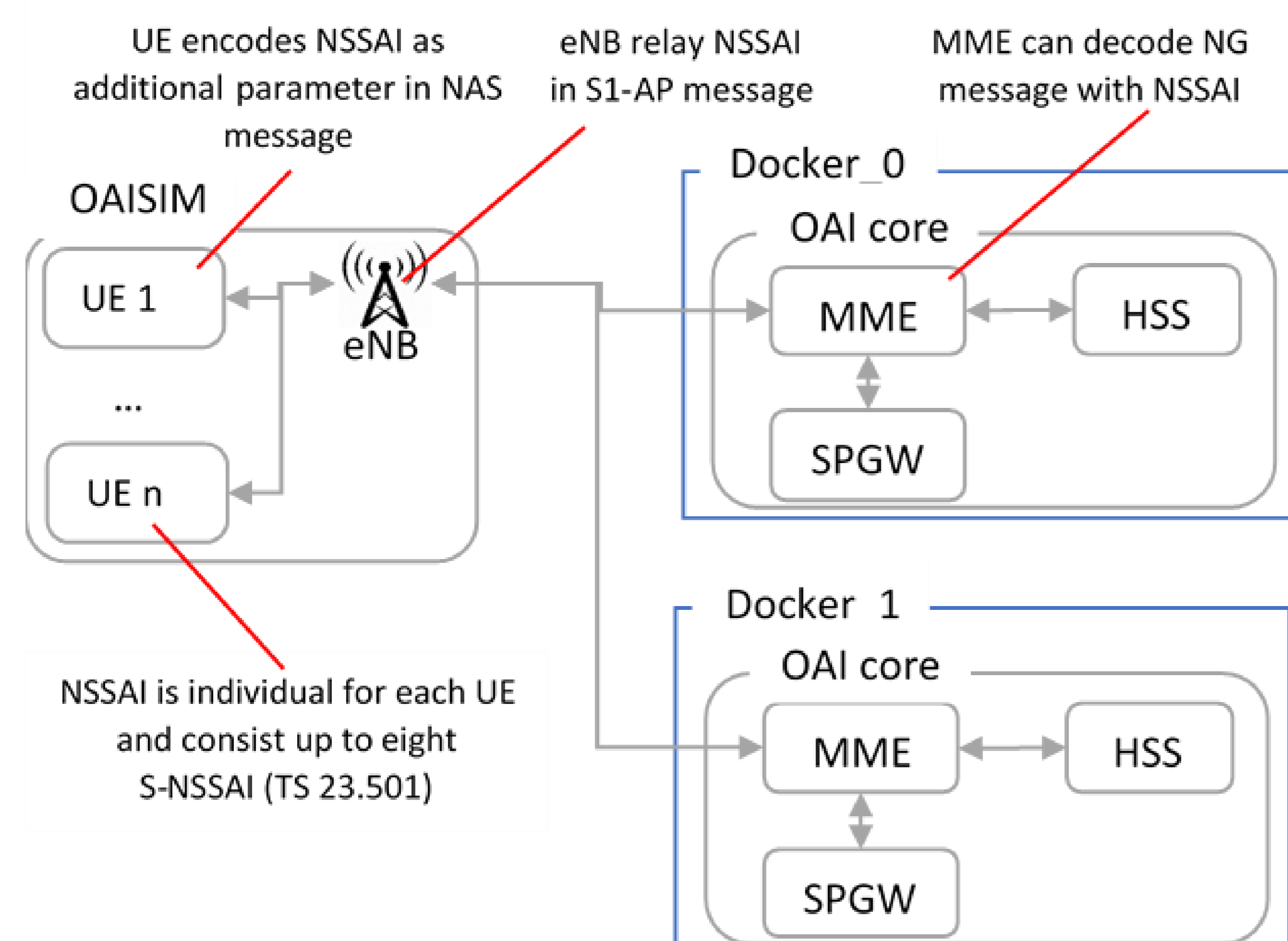
- **5G networks** are under development and **Network Slicing (NS)** is one of the major enablers of next generation networks
- Many research groups propose **solutions** on NS general architecture and security
- **Evaluation** of these solutions is very important to avoid **security, privacy, and performance** issues

Design

- To enable slice selection function the UE contains **Network Slice Selection Assistance Information (NSSAI)** regarding TS 23.501
- eNB relays NSSAI to MME while UE **attach request**
- **Backward compatibility:** Modified MME can serve regular LTE UE's

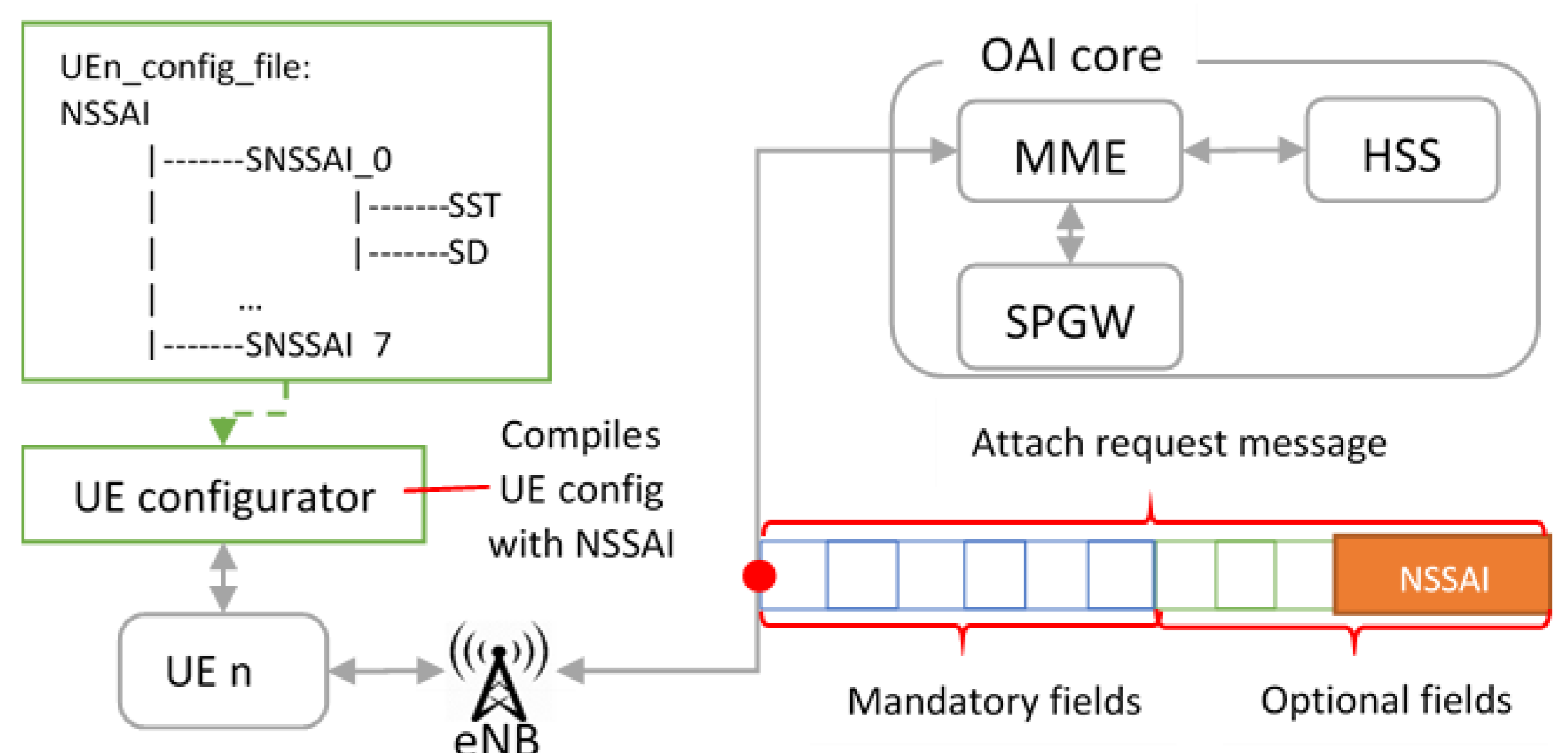
New features

- **UE:** NSSAI can be read from configuration file for each UE. Up to eight S-NSSAIs can be added. Each S-NSSAI has SST and SD parameter
- **CN:** MME can decode NSSAI for further processing
- **Containerization:** Multiple CNs can be run on the same machine to imitate different NSs



Implementation

- UE+AN are simulated with help of OAI Simulator (OASIM)
- Core Network presented by OAI Core Network (OAI-CN)
- OAI-CN is packed to Docker container
- NSSAI is added as additional fields to attach request message as mentioned in TS 23.502



Benefits of 5G testbed

- Allows to study potential **attacks** on NSSAI from different **angles** e.g. protocol, NS selection function in AN, processing NSSAI in CN
- Provides environment to **test** architectural and security **solutions** which manipulate NSSAI on UE, AN, and CN level
- Containers allow to **run, select, and access** the virtual **networks (NS)** that have **different performance and security** configurations at the same time

