

5G Femto study proposal (supporting material)

Nokia, Verizon, Casa Systems, Oracle, BT,
MATRIXX Software, SK Telecom, AT&T, Samsung,
Cisco, NTT DOCOMO, T-Mobile US, Telefonica,
Reliance Jio

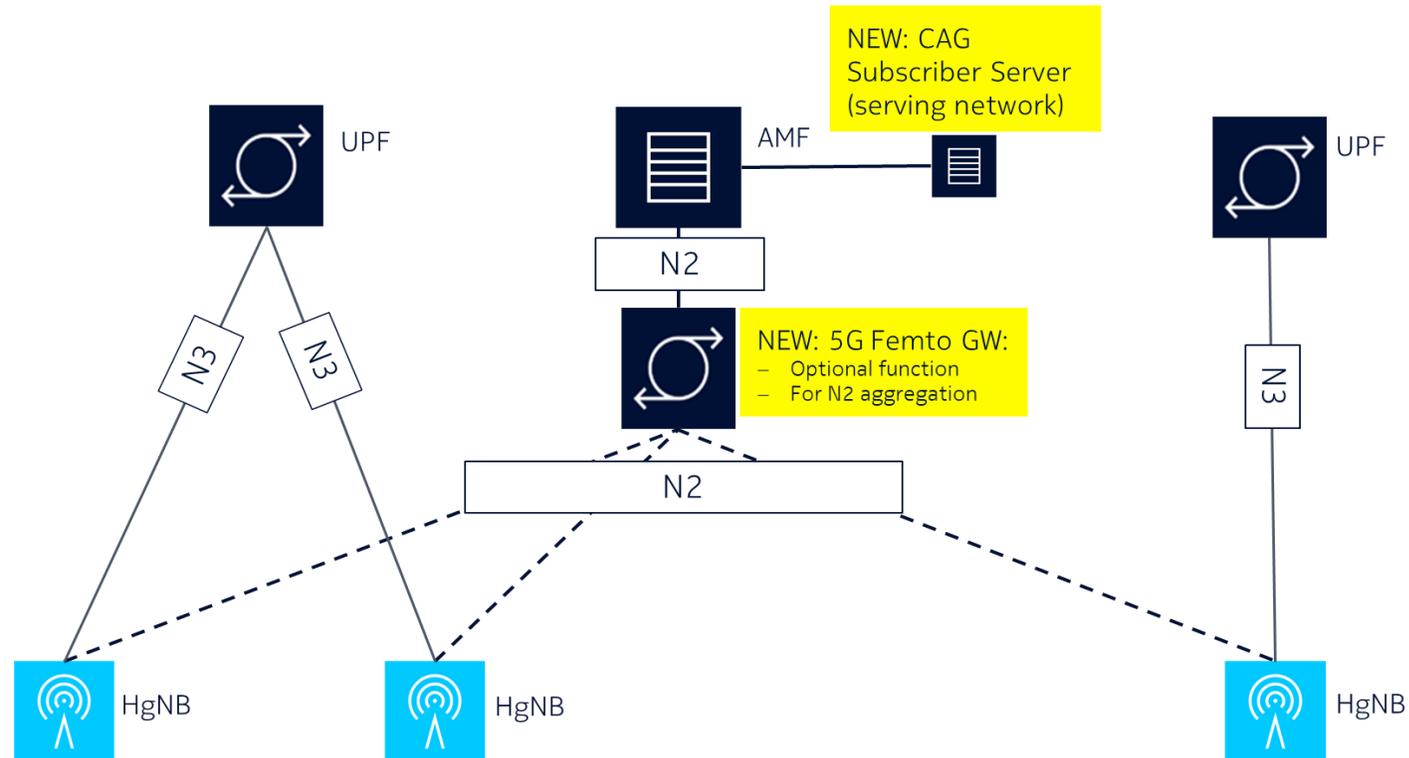
Motivation

- Femto or Home eNB/Home NodeB is a well-known concept that were defined in previous releases allowing small access points deployed in customer premises (on a campus or at home) for **access to operator, Internet and local services** like local printers or local servers
- 3G/LTE based Femto deployments exist in the market but there is no standardized 5G Femto architecture enabling smooth upgrade from 3G/LTE to 5G Femto, leveraging **higher throughput and lower delay** provided by 5G
- High bandwidth and throughput with 5G are required at home and at campus locations to enable new immersive applications such as AR/VR/MR gaming, e-sports, UHD 8K video, telepresence, etc.
- Main goal of this study item is to define the overall architecture and required functional and procedural impacts for supporting deployments of 5G Femto with focus on enabling access control for 5G Femto use cases
- 5G Femto offers a cost-effective way to **improve 5G indoor coverage, offload traffic from the macro network, enabling better voice quality, and better support for Enterprise mobility**
- 5G Femto extends coverage using higher frequency bands (e.g., FR2 bands) leading to efficient and effective usage of higher frequency spectrum
- 5G Femto enables a simple way for **plug-and-play of 5G radio equipment** at customer sites and for **customized access control** for visitors

Content of the 5G Femto Study

- How to define the overall architecture and required functional and procedural impacts for supporting 5G Femto deployments.
- How to define the 5G Femto access control mechanism based on the existing CAG concept.
 - RAN internal architecture aspects need to be studied in RAN WGs (introducing a Femto GW, Xn enhancements). Cooperation with RAN WGs is required, e.g., regarding potential enhancements to the RAN-Core interface (NGAP enhancements).
- How to enable provisioning of subscribers allowed to access 5G Femto cells and how to manage 5G Femto access control by the Closed Access Group (CAG) owner or an authorized administrator
 - Access control for visitors may require a function like the CSG Subscriber Server (CSS) specified for EPS
 - Possible enhancements to the existing CAG concept introduced for PNI-NPN may require cooperation with RAN WGs
- How to enable access to DN and local services (like printers or servers) via an UPF integrated in the HgNB

Potential 5G Femto architecture



Summary

- Femto is a concept specified in 3G and LTE times, deployed in networks
- For 5G a similar concept is currently missing allowing to monetize the 5G Femto business case
- 5G Femto enables improved 5G indoor coverage, offloading traffic from the macro network, better voice quality and support for mobility
- Applications at home or in Enterprises with high demand on throughput and lower delay benefit from 5G Femto deployments