4G and 5G Interworking – 1 day

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This course presents the interconnection and interworking procedures between 4G Evolved Packet System and 5G System, as specified in the 3GPP standards.

The course focuses on the deployment options, UE capabilities, network features, plus procedures for idle and connected mode device mobility and service continuity in a multi-access environment with 4G/5G core networks and possible inter-RAT dual connectivity scenarios.

PREREQUISITES

Technical knowledge of the architecture and procedures in the 4G and 5G systems is necessary.

Attending Apis “LTE System Overview” and “5G System Overview” courses or having the equivalent knowledge will allow the participants to benefit fully from the course.

Note: This course is not delivered with the FoldOut methodology.

Network Architecture

- Brief overview of the 4G and 5G System architecture.
- Overview of deployment options for 4G and 5G core networks.
- Overview of deployment options for connecting 4G/5G radio to 4G/5G core networks.
- Brief overview of the IMS functionalities.
- Protocol used for communication on various interfaces within 4G/5G core networks, towards RAN, and to/inside IMS network elements.
- Overview of idle and connected mode mobility procedures for UEs moving between 2G/3G/4G/5G radio and core network.
- Overview of various possibilities to handle IMS signaling and media between 4G/5G RAN and core network.
- Data connectivity: PDN Connections and EPS Bearers in 4G, PDU Sessions and QoS Flows in 5G.

Interworking: Core Network

- Deployment options for HSS/UDM/UDR.
- UE idle mode mobility procedures between 2G, 3G, 4G, and 5G.
- UE connected mode mobility procedures between 2G, 3G, 4G, and 5G.
- Handling of data connections in idle/connected mode mobility procedures.
- PDN Connection/PDU Session establishment aspects: CN domain selection, redirection, etc.
- Single and dual registration mode UEs.
- Interworking with and without N26 interfaces between 4G and 5G core networks.
- RAT Fallback and EPS Fallback for IMS sessions.
- Handling of Terminating Access Domain Selection for MT IMS calls.
- SMS transport options over 4G, 5G, and IMS over 4G or 5G.
- ANDSP and URSP data connections.
- Comparison of optimizations and data transfer options for IoT devices.

Interworking: Access Network

- 5G Access Network options: NR, E-UTRA, Wi-Fi, Fixed Access.
- Various intra-/inter-RAT Dual Connectivity options.
- System Information parameters and UE radio capabilities related to IMS and 4G/5G interworking.

- RAN bases Dual Connectivity procedures.
- CN-based and RAN-based User Plane splitting options.
- Session transfer procedures between 3GPP and non-3GPP access, e.g.: Wi-Fi to/from 5G NR.
- RAN procedures for Dual Connectivity handling: Secondary Node handling, handover procedures.
- Unified Access Control in 5G.