

# 5G Core Network in an Hour

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## CONTENTS

This course provides a condensed overview of the 5G Core Network as defined in the R16 3GPP standards. It is intended to give a quick and concise summary of improvements and new concepts when comparing with the 4G EPC.

“5G Core Network in an Hour” provides a birds-eye view of the topic, focusing on the principles of the Service Based Architecture design and on the new network features intended to facilitate handling of the modern services, with high demands on the transport network resource guarantees.

It has been designed to be fully covered by students within one hour. This course also has a one day and a full three-day version.

## PREREQUISITES

Technical knowledge of the mobile telecom, especially the 4G LTE/EPS is strongly recommended.

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

## Rationale behind defining a new system: why not LTE?

- Defects of the LTE
- Modern day application/service requirements
- 5G Use Cases
  - Enhanced Mobile Broadband, eMBB
  - Massive Internet of Things, MIIoT
  - Ultra-Reliable and Low Latency Communication, URLLC
  - Vehicle-to-Anything, V2X

## 5G Deployment Options

- 5G Dual Connectivity Deployment options:
  - Options 3 and 7: Non-Standalone New Radio
  - Option 4: Non-Standalone E-UTRA
  - Option 2: Standalone New Radio
- Co-existing/Combined EPS and 5GC

## Service Based Architecture, SBA

- The SBA Design
- Communication Principles over the SBA
- Reference Points
- Security on the SBA
- Cloud-native approach to the SBA design:
  - NF Virtualization
  - Deployment options: Virtual Machines/Containers

## 5G Core Network Features

- Network Slicing
  - What is a Network Slice?
  - What are the benefits of deploying Network Slices?
  - Identifiers for Network Slices
  - Principles to allocate appropriate Network Slice(s) for a UE/service and the role of the Network Slice Selection Function, NSSF

- Multi-access Edge Computing, MEC
  - What is Edge Computing?
  - What are the benefits of using Edge Computing?

### Resource Definitions for 5G

- PDU Sessions:
  - PDU Session with Multiple PDU Session Anchors, PSAs
  - PSA/IP address change for an active PDU Session
  - Local Area Data Networks, LADN
- QoS Flows

### Service Influencing

- AF as an external source of service-specific data handling
- Influencing of QoS, routing and charging in 5G
- Information exchange between an external AF and the 5GC:
  - Subscription Data
  - Policy Rules
  - Event Monitoring
  - Analytics
- Policy Control: Access management, Mobility Management, QoS, routing and charging rules

### 5G Security

- Improvements compared to 4G:
  - UE Authentication
  - UE Identity protection