ATS

4G, 5G & ORAN PREMIUM SYLLABUS TRAINING

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SUMMARY

TECHNOLOGY

INTERVIEW PREPRATION

Session on Lab setup description, Testing Types, Test cases.
Technical question/answer s discussion.

SUPPORT

Resume preparation.
Naukari profile Optimization.
LinkedIn Profile Optimization.
Dedicated Pre Interview discussion.

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TRAINING SESSIONS CENTER

Live Classes Recording will be provided for each session.
Interactive Sessions.

TOOLS SESSION

QXDM/QCAT,ELT,LOGEL Wireshark, Keysight Novamos & Automation Tool

LAB SESSION

5G SDN Lab
LTE SDN Lab

Aarav Tech Solutions

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Training Sessions

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Tools Sessions

- QXDM
- QCAT
- ELT
- LOGEL
- Wireshark

Labs Sessions

- O-RAN Lab Setup
- 5G Lab Setup
- LTE Lab Setup

Interview Prepration

- Session on Lab
- Setup description,
- Testing Types
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Training Sessions

4G

5G

O-RAN

LTE

LTE-4G

- What is Testing & Why we need Testing?
- Testing Life Cycle
- Types of Testing in Telecommunication
- Testing Setup
- Test Cases description
- 3gpp Specification
- LTE Architecture and its Network Elements
- Function of nodes (eNodeB,MME,PGW,SGW,PCRF,HSS)
- LTE interfaces LTE-UU,S1,X2AP,S1-U,S11,S6A,S10,S5/S8
- LTE Protocol Stack
- Function of protocol stacks (NAS,RRC,PDCP,RLC,MAC)
- LTE Bands
- LTE Frame structure
- Resource Block,Resource Element(RE),Resource ElementGroup (REG)
- LTE Scalable Bandwidth
- Modulation Scheme
- OFDMA & SC-FDMA
- CP (Cyclic prefix)
- Channels and Channels Mapping
- PDCCH
- DCI (Downlink Control Information)
-

LTE-4G

- RNTI (Radio Network Temporary Identifier)
- RNTI and DCI mapping
- Radio Bearer (SRB and DRB)
- SRB (Signaling Radio Bearers) (SRB0,1,2)
- DRB (Data Radio Bearer)
- Non -GBR & GBR
- Transmission Mode
- Reference Signal
- RI,PMI and CQI
- Initial Acquisition/UE Power ON Procedure
- PSS
- SSS
- MIB
- SIB1 & SIB2
- Random Access Procedure(RACH) in LTE
- Types of RACH
- RACH Preambles
- Timers
- IMSI,TMSI,GUTI
- NAS : EMM & ESM
- RRC Conn Request & Setup
- Attach Request
- ESM Info Request & Answer
-

LTE-4G

- Attach Accept/ Activate default bearer request
- Attach Complete
- Modify Bearer Request/Response
- Security and Authentication
- Keys
- Authentication Info Request
- Authentication Info Answer
- Authentication Request
- Authentication Response
- Security Mode command
- Security Mode complete
- Control plane and RRC functionalities
- RRC functionalities and RRC states
- RRC – Connection Reconfiguration
- RRC – Connection Reestablishment
- RRC – Connection Release
- LTE Handover Concept
- X2 and S1 Handover Call Flow
- measurement related rrc reconfiguration
- Measurement GAP
-

LTE-4G

- LTE CSFB (Circuit Switch Fall Back)
- CSFB call flow
- Volte
- Mac layer process
- MAC Layer Functionalities
- MAC PDU Format for DL-SCH and UL-SCH
- MAC Subheader for DL-SCH and UL-SCH
- MAC Control Element
- HARQ (Hybrid Automatic Repeat Request)
- SR (Scheduling request)
- Scheduling
- BSR (Buffer Status Report)
- PHR (Power Headroom Report)
- LTE Paging
- DRX (Discontinuous Reception)
- PUCCH (Physical Uplink Control Channel)
- RLC (Radio Link Control) Functionalities
- TM,AM,UM
- LTE PDCP SubLayer – Structured view
- RObust Header Compression (ROHC)
- TE Advanced - Carrier Aggregation
- Carrier Aggregation Types
-

Content

5G-NR

- What is 5G?Introduction.
- The 5G Use Cases.
- 3gpp standard of 5G-NR.
- 5G Architecture(NSA & SA).
- 5G Deployment Options.
- 5G Service Based Architecture.
- 5G Core and each nodes functionalities.
- 5G-Network Slicing.
- 5G Bands (FR1 & FR2).
- 5G Different spectrum for different use cases Supplementary Uplink (SUL) and Supplementary Downlink(SDL) 5G-NR Numerology, Subcarrier Spacing .
- 5G-NR Frame structure, slots length.
- SRB (Signaling Radio Bearer).
- 5G NR Protocols. User Plane Protocol Stack.
- Control Plane Protocol Stack
- .SDAP (Service Data Adaptation Protocol).
- PDCP (Packet Data Convergence Protocol).
- RLC (Radio Link Control) RRC (Radio Resource Control).
- 5G Channels.
- SS Blocks (Time & Frequency domain).

5G-NR

- SS Burst,SS Burst set.
- PBCH DMRS(DeModulation Reference Signal)
- 5G NR CORESET – Control Resource Set
- 5G Recourse allocation in Time Domain.
- 5G Recourse allocation in frequency Domain.
- DCI in 5G.
- RNTI in 5G.
- Scheduling in 5G.
- 5G QOS.
- RRC States in 5G.
- Beamforming.
- Cell Search Procedure – Non Standalone Architecture(NSA)
- Cell Search Procedure –Standalone Architecture (SA)
- RACH in 5G-NR.
- 5G Call Flow (eNB - gNB dual connectivity) with logs.
- 5G SA Call flow with logs.
-

ORAN

- History of Open RAN.
- What is Open RAN ?
- Why Open RAN?
- Goal of Open RAN
- Example Scenario: OpenRAN Deployment Model
- Evolution to 5G OpenRAN
- RU(Radio Unit).
- CU (Centralized Unit).
- DU (Distributed Unit).
- RU/DU/CU Architecture .
- O-RAN Specification (Working groups (WG) Details).
- O-RAN Specification (Working groups Details).
- 7.2x Slpit
- Challenges in ORAN
- Lab Setup
- High Level Architecture of ORAN
- RIC
- Non RT RIC
- Near RT RIC
- Service Management and Orchestration (SMO)
- FCAPS
- CPRI & eCPRI
-

ORAN

- CPRI characteristics.
- eCPRI characteristics.
- IQ Data Transfer procedure.
- PTP (Precise Time Protocol (IEEE 1588))
- SyncE (Synchronous Ethernet)
- C-plane Protocol
- U-plane Protocol
- S-plane Protocol
- Clock Model and Synchronization Topology.
- Configuration LLS-C1
- Configuration LLS-C2
- Configuration LLS-C3
- Configuration LLS-C4
- Open RAN Management Plane (M-plane) for Open RadioUnit.
- Hierarchical model.
- Hybrid model.
- M-Plane functional description
- NETCONF Call Home to O-RU Controller(s)
- SSH Connection Establishment
- NETCONF Security
- NETCONF Authentication
- DHCP
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thank you

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