

# Gautam Kumar

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## Objectives:

Looking for a challenging opportunity to work as **5G|LTE|IMS System Testing (eNodeB or UE)** and Log analysis Engineer in challenging environment where I can expose my Testing/Debugging skills and abilities to contribute it towards organizational and individual professional growth. Capable and flexible to work under aggressive project timelines and able to work on all technical aspect of project

## Experience Summary:

Having **(9+ years)** Experience in Telecom industry, **3 Years in Quality Assurance** for Protocol and RF, and **3 Years in LTE Protocol testing in MAC, RLC (LAYER-2) UE Conformance Testing and RRC (LAYER-3) UE Conformance Testing.**

## Technical skills:

- ✓ Very good knowledge in LTE, NR Architecture.
- ✓ Good understanding of 4G, 5G Network Architecture.
- ✓ Good Understanding of the Wireless Technology UMTS, LTE.
- ✓ In Depth knowledge of LTE protocol stacks **RRC, RLC, PDCP, MAC.**
- ✓ Good knowledge of services and functions provided by each layer in LTE protocol stack (Both eNB side and UE side).
- ✓ Having work experience of Automation Testing, Regression Testing, Sanity Testing.
- ✓ Having good knowledge on LTE call Flows, Registration, Attach/Detach procedures Handovers (Intra & Inter-RAT), SIBs, and MIB.
- ✓ Having good knowledge in LTE Network Element Application Protocols S1AP, X2AP.
- ✓ Having knowledge on GTPC, Diameter protocol.
- ✓ Understanding of LTE Core Network Elements like MME, HSS, PCRF, SGW, PGW etc.
- ✓ Basic understanding of LTE Core interfaces (S1, S5, S10, S11, S13, S6A, Gx, SGi etc.)
- ✓ Very good working experience in LTE Conformance testing.
- ✓ Good understanding of different test scenario and setup configuration.
- ✓ Having a knowledge in Volte (IMS).
- ✓ Knowledge in TTCN3, PYTHON scripting languages.
- ✓ Good understanding in tools like PCT, PCAT, QXDM, QPST, QCAT.
- ✓ Good understanding on Bug Life Cycle.
- ✓ Good knowledge of Generating log files and interacting with the development/analysis team to resolve problems.
- ✓ Spec knowledge NR PHY 38.211, 38.523, 38.521.
- ✓ Having knowledge about basic 5G overview.
- ✓ Optimizing RF related parameters Retuning by analysing Drive logs and site data.
- ✓ Neighbours list analysis, Interference and Coverage Analysis and to suggest for changes to be made in network to Optimize the given network.

- ✓ Performing hard optimization of the network to minimize coverage loss & interference. RSRP, RSRQ, SINR, PCI.

### Testing Tools Knowledge:

Testing Tools	: Keysight, Anritsu, Elvior TestCast, Ericsson, Jio, Log Viewer, Qxdm, Qpst, Qcat.
Packet snipping tools	: Wire shark
Bug tracking tools	: Jira, Bugzilla
Scripting Languages	: TTCN3
Protocol	: RRC, PDCP, RLC, MAC, PHY
Operating Systems	: LINUX, WINDOWS

### Work Experience:

Working as a **Technical Lead** for **HCL Technologies, Bangalore, India** from August 2021 to till date.

### PROFESSIONAL EXPERIENCE:

#### **PROJECT 6 : QA for PCAT/PCT and RCT/RCAT/REG Product.**

Client	: <b>Keysight -Bangalore.</b>
Role	: Conformance Test Engineer.
Industry	: OEM-Wireless Test Solutions.
Domain	: LTE-5G NR PCT/PCAT/RF/ REG/RCAT Products.

### Project Description:

- The aim of the project is **Quality Assurance** for PCAT/PCT and RCT/RCAT/REG Product.
- 4G/5G Device Testing includes Protocol Carrier Acceptance Testing (PCAT) based on 3GPP specifications and Protocol Conformance Testing (PCT) based on GCF & PTCRB specifications for MNOs and MSOs of USA Telecom operators like Dish, ATT, Verizon etc.
- Executing Test Cases for MNOs like ATT, Verizon, T-MO etc., using Keysight Hardware and preparing Deliverable PQA report by analysing all aspects like Licenses & Logs Verification, Hardware requirement details and Network Scenario of every test case.
- Remote debugging with customer station for Critical issues. Worked on FR1/FR2 Benchtop, Full rack for sanity and regression testing.
- 4G/5G Protocol Test cases Development and Testing using Python programming as per 3GPP specifications and releases time to time.

### **Responsibilities:**

- ✓ Performing Sanity Testing, Regression Testing, Functional Testing with different RAT combinations on MTK & Qualcomm chipset platforms in Lab where different scenarios are being executed.
- ✓ Provide correct first level analysis and assign to next component for further analysis.
- ✓ Working on Agile Development tools like: Git, JIRA, Confluence, Bit bucket etc.
- ✓ Running Campaign of Test Cases, Analysing the Failed logs and inconclusive test cases using log analysis tool.
- ✓ Raising JIRA tickets and working closely with development team on product issues and getting resolved for smooth release by running daily Scrum Calls.
- ✓ Verdict debugging and reporting the bugs to the development team.
- ✓ Monitoring all HDRs and Internal JIRA's.

### **Previous Work Experience**

Company	Designation	Work Period
Cellplan Technology Private Limited	LTE Testing / RAN Engineer	July-16 to July-21
Telecom Network Solution	RF Engineer	Oct-14 to June-16

#### **PROJECT 5 : RRC (LAYER-3) UE Conformance Testing**

Duration : October 2020 to July 2021

Protocol : RRC

Tools : Elvior TestCast

Scripting Language: TTCN 3

Role : Testing Engineer

#### **Project Description:**

- Layers configuration for LTE, L3 (RRC).
- The project involved in the UE conformance testing before the product moves to the next level testing.
- The aim of the project is to validate the RRC features in the mobile handsets against the protocol specifications provided by 3GPP 36.331
- This project includes Conformance Testing of RRC protocols by using Conformance Tool set and involves Execution of test cases from 3GPP specification 36.523(for 4G) on test system ANITE.
- The features I have tested Include
  - RRC connection establishment.
  - RRC connection release.
  - RRC connection reestablishment.
  - RRC connection reconfiguration.
  - Radio link failure.
- Test cases of RRC are executed using Elvior TestCast Tool, Log files are checked for bug reporting

### **Responsibilities:**

- ✓ Good understanding of 3gpp specifications 36 series of RRC.
- ✓ LTE log analysis, Bug tracking and reporting of bugs using Bugzilla.
- ✓ Verdict debugging and reporting the bugs to the development team.
- ✓ Understanding the requirements for LTE test scenarios to be executed on Anite.
- ✓ Creation and automation of test suites for Conformance testing.
- ✓ Analysis of test logs to pin point issues.
- ✓ Preparation of test plans for the above activities based on 3GPP specifications.
- ✓ Bug Tracking and test case management using Quality Centre.

### **PROJECT 4 : MAC, RLC (LAYER-2) UE Conformance Testing**

Duration : Feb 2019 to Oct 2020  
Project : UE PROTOCOL CONFORMANCE  
Tools : Elvior TestCast  
Scripting Language: TTCN 3  
Protocols : MAC, RLC  
Team Size : 6  
Role : Testing Engineer

### **Project Description:**

- This project includes conformance testing of MAC Layer features in mobile handset according to the Test specification 36.523 provided by 3GPP.
- The Medium Access Control (MAC) layer of the radio interface protocol stack is specified within 3GPP TS 36.321.
- The Radio Link Control (RLC) layer of the radio interface protocol stack is specified within 3GPP TS 36.322.
- The features I have tested
  - Mapping between logical channels and transport channels.
  - MAC back off indicator.
  - MAC padding.
  - Logical channel prioritization handling.
  - Correct handling of MAC control information / Buffer status / Periodic BSR timer expires.
  - MAC PDU header handling
  - Unacknowledged mode.
  - Acknowledged mode.
- Test cases of MAC and RLC are executed using Elvior TestCast Tool.
- Log files are checked for bug reporting.

### **Roles and Responsibilities:**

- ✓ Executing the test cases and arriving at conclusion against expected result.
- ✓ LTE log analysis, Bug Tracking and Reporting.

- ✓ Understanding and analysing each test case before actual testing starts.
- ✓ Understand the 3GPP specification documents for the protocol MAC, RLC.
- ✓ To provide detail reports on daily basis with bugs and initial analysis for problems. Providing the logs to developers with the cause of failure
- ✓ Putting the actual failures in the error tracking system with detail analysis reports, cause of failure, and the real time logs are attached.

### **PROJECT 3 : MAC Layer UE Conformance Testing**

Duration : July 2018 to Feb 2019  
 Project : UE PROTOCOL CONFORMANCE  
 Tools : Elvior TestCast, Anite 9000  
 Scripting Language: TTCN 3  
 Protocols : MAC  
 Team Size : 6  
 Role : Testing Engineer

#### **Project Description:**

- This project includes conformance testing of MAC Layer features in mobile handset according to the Test specification 36.523 provided by 3GPP.
- The Medium Access Control (MAC) layer of the radio interface protocol stack is specified within 3GPP TS 36.321.
- The features I have tested
  - Mapping between logical channels and transport channels.
  - MAC Back off- indicator.
  - MAC padding.
  - Logical channel prioritization handling.
  - Correct handling of MAC control information / Buffer status / Periodic BSR timer expires.
  - MAC PDU header handling
- Test cases of MAC and RLC are executed using Elvior TestCast Tool.
- Log files are checked for bug reporting.

#### **Roles and Responsibilities:**

- ✓ Executing the test cases and arriving at conclusion against expected result.
- ✓ LTE log analysis, Bug Tracking and Reporting.
- ✓ Understanding and analysing each test case before actual testing starts.
- ✓ Understand the 3GPP specification documents for the protocol MAC.
- ✓ To provide detail reports on daily basis with bugs and initial analysis for problems. Providing the logs to developers with the cause of failure
- ✓ Putting the actual failures in the error tracking system with detail analysis reports, cause of failure, and the real time logs are attached.

### **PROJECT 2 : ENB, E2E Testing .**

Duration : July 2016 to June 2018  
 Client : Ericsson - Maharashtra  
 Project : SCFT, SCVT, LTE log analysis testing  
 Tools : TEMS, NEMO, TEMS DISCOVERY,

Protocols : L1,L2,L3  
Team Size : 12  
Role : RAN Engineer  
Company : Cellplan Technology Private Limited

### **Project Description & Responsibilities:**

- Analysis for Call Drop and Call Setup Failure
- Performing Drive Test & Optimization for 4G Network.
- Post Processing of Log Files.
- log analysis of RRC, MAC, PHY layer
- Neighbour's optimizations, TCH Blocking, Drop call rate, Handover failure ratio,
- Optimizing RF related parameters Retuning by analysing Drive logs and site data.
- Experience on Dual Band 900/1800.
- Neighbours list analysis, Interference and Coverage Analysis and to suggest for changes to be made in network to Optimize the given network.
- Handling all RF related customer complaints by checking / inspecting serving BTS site  
Planned additional sites, if any.
- Performing hard optimization of the network to minimize coverage loss & interference. RSRP, RSRQ, SINR, PCI,
- Doing Drive Test with TEMS, and analysing RSRP, RSRQ, Call Drop, bad quality, interference, swaps handover failures, physical optimization.
- Analysis of log files on TEMS Optimization of new sits as well as existing sits.
- RSCP, EC/IO, SC, HSDPA, HSUPA, MULTI RAB, HSDPA, HSUPA testing through R99  
Analysis of log files on TEMS.
- Features which I have tested:
  1. Peak Throughput DL, UL with log analysis
  2. MO, MT call verification
  3. Ping test
  4. Registration, Deregistration features
  5. Intra cell HO

### **PROJECT 1 : ENB, E2E Testing .**

Duration : OCT 2014 to June 2016  
Client : Ericsson - Rajasthan  
Project : SCFT, SCVT, LTE log analysis testing  
Tools : TEMS, NEMO, TEMS DISCOVERY,  
Protocols : L1,L2,L3  
Team Size : 8  
Role : RF Engineer  
Company : **Telecom Network Solution.**

## **Project Description & Responsibilities:**

- Preparation of circle Daily SCFT Plan Data.
- Check RSRP, RSRQ, SINR and Physical cell identity (PCI), TAC and resolve swap during Drive Test
- Cluster Drive, Scanner and MRO drive experience, HOTSPOT Test, IBS Test.
- Check Latency
- SCFT of 4G Sites (PING, ATDT, CSFB, SMS, PDSCH throughput, PUSCH throughput).
- Doing Cluster Drive for WCDMA, GSM.
- Cluster Drive for Data & Voice to identify the region having bad Network Coverage.
- Check Network Parameter like a RSCP, EC/NO, Throughputs for WCDMA.
- Providing solutions for different abnormal events during drive tests, analysis of Handover Failure, Missing Neighbor using test logs.

## **Education Qualification:**

**B Tech in Electronics and Communication Engineering** (2014) from **Biju Patnaik University of Technology**.

## **Personal Skills:**

- Productive, Adaptability to new atmosphere
- Self-motivated hard worker
- Quick learner
- Able to lead the team
- Hard working with intelligence

## **Personal Details:**

- Nationality : Indian
- Languages Known : English, Hindi

## **Declaration:**

I hereby declare that the information furnished above is true to the best of my knowledge and belief.

**Place: Bangalore**

**Name**

**Date:**