Case Study Report: Exploring Field Test Mode on Smartphones

Objective: The purpose of this case study is to explore and understand key networking information available on smartphones by accessing Field Test Mode or using other diagnostic tools. This report details how to gather essential information about the phone's network settings and performance.

1. Device Types Covered:

- **Android Device** (My Oneplus Mobile)

2. Key Network Information

Below is a summary of each network parameter collected during the field test and its importance.

2.1 IMEI

- **Explanation:**
  The IMEI is a unique 15-digit number that identifies each mobile device. It is essential for network operators to distinguish between different devices, and it is used to block stolen phones from accessing the network.

2.2 MAC

- **Explanation:**
  The MAC address is a unique identifier assigned to the phone's network interfaces (such as Wi-Fi or Bluetooth). It operates at the data link layer of the OSI model.

2.3 IP Address

- **Explanation:**
  An IP address is assigned to a device when it connects to the internet. It can either be dynamic (changing) or static (permanent).

2.4 Network Operator/Brand

- **Explanation:**
  This refers to the name of the cellular provider offering network services to the device (e.g., Verizon, AT&T, Airtel).

2.5 Network Type (4G LTE, 5G, etc.)

- **Explanation:**
  The network type shows the generation of cellular technology the phone is currently connected to, such as 4G LTE, 5G, or 3G.

2.6 Signal Strength (Measured in dBm)

- **Explanation:**
  Signal strength is the strength of the connection between the phone and the cell tower, measured in dBm (decibels relative to 1 milliwatt). The closer the number is to zero, the stronger the signal (e.g., -50 dBm is stronger than -100 dBm).

2.7 Download/Upload Bandwidth

- **Explanation:**
  This refers to the physical channel configuration and the speed at which data is transferred. Download bandwidth represents how quickly data is received by the device, while upload bandwidth is the rate of data sent from the device.

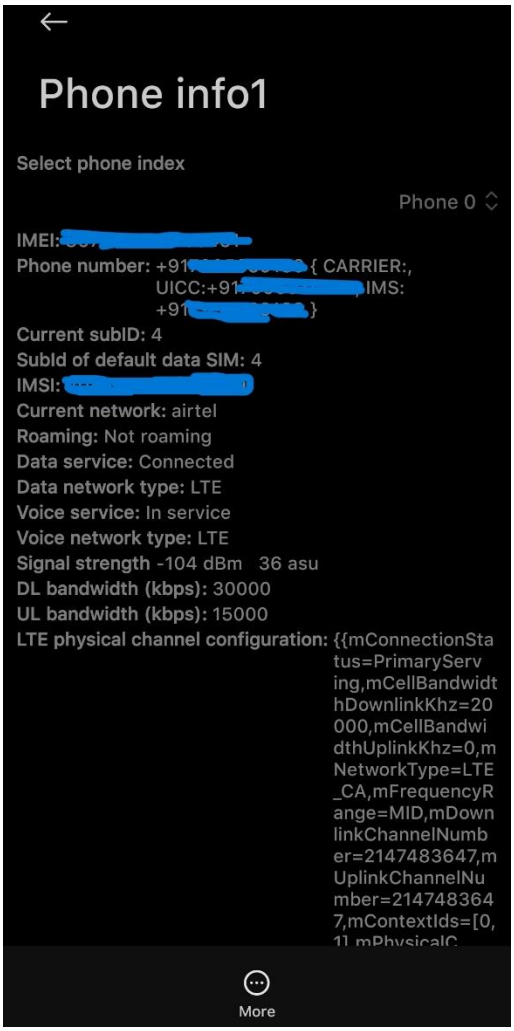
2.8 Mobile Location Information (LAC - Location Area Code and CID - Cell ID)

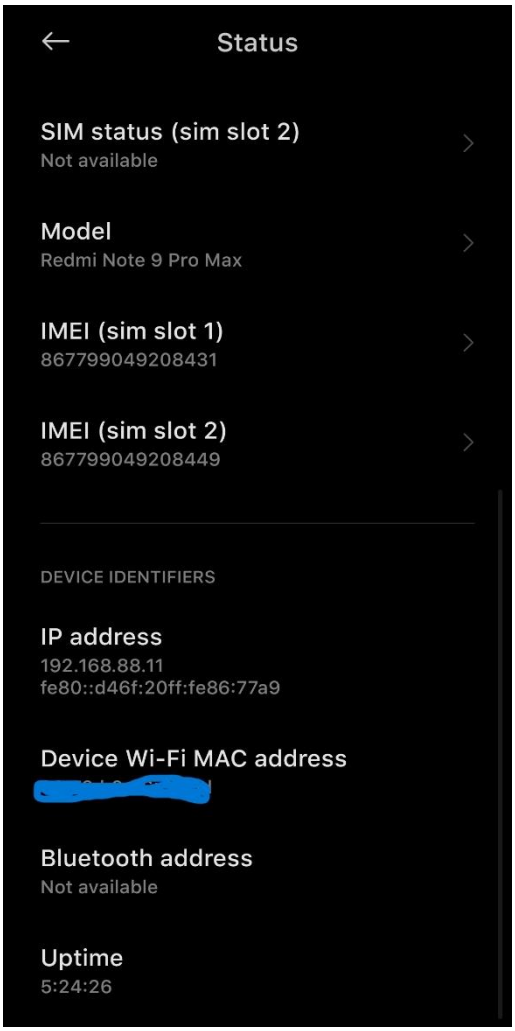
- **Explanation:**
  The Location Area Code (LAC) is a unique number assigned to a group of cell towers in a specific geographic area. The Cell ID (CID) identifies a specific cell tower within that LAC.

3. Screenshots from Field Test Mode

3.1 Android Device (General)

- IMEI, Signal Strength, Network Type:





4. Steps to Access Field Test Mode

4.1 Android Devices

1. Open the phone dialer.
2. Enter `*#*#4636#*#*` to access the testing menu.
3. Navigate to **Phone Information** and **Wi-Fi Information**.
4. Collect and screenshot the IMEI, signal strength, network type, etc.

5. Conclusion

Through this case study, I have gained an understanding of key network parameters such as IMEI, MAC Address, IP Address, and others. By accessing Field Test Mode, I could gather critical insights about my device's connection to the network, its signal strength, and performance characteristics. This exercise provided a practical exploration of mobile network diagnostics and reinforced the importance of these parameters in understanding how smartphones communicate with cellular networks.

6. Submission

- **GitHub Repository:** Case-Study-Assignment
- **Google Classroom Submission:** Submitted via Google Classroom.

This concludes my case study report on exploring Field Test Mode on smartphones. The screenshots and collected data are attached for further reference.