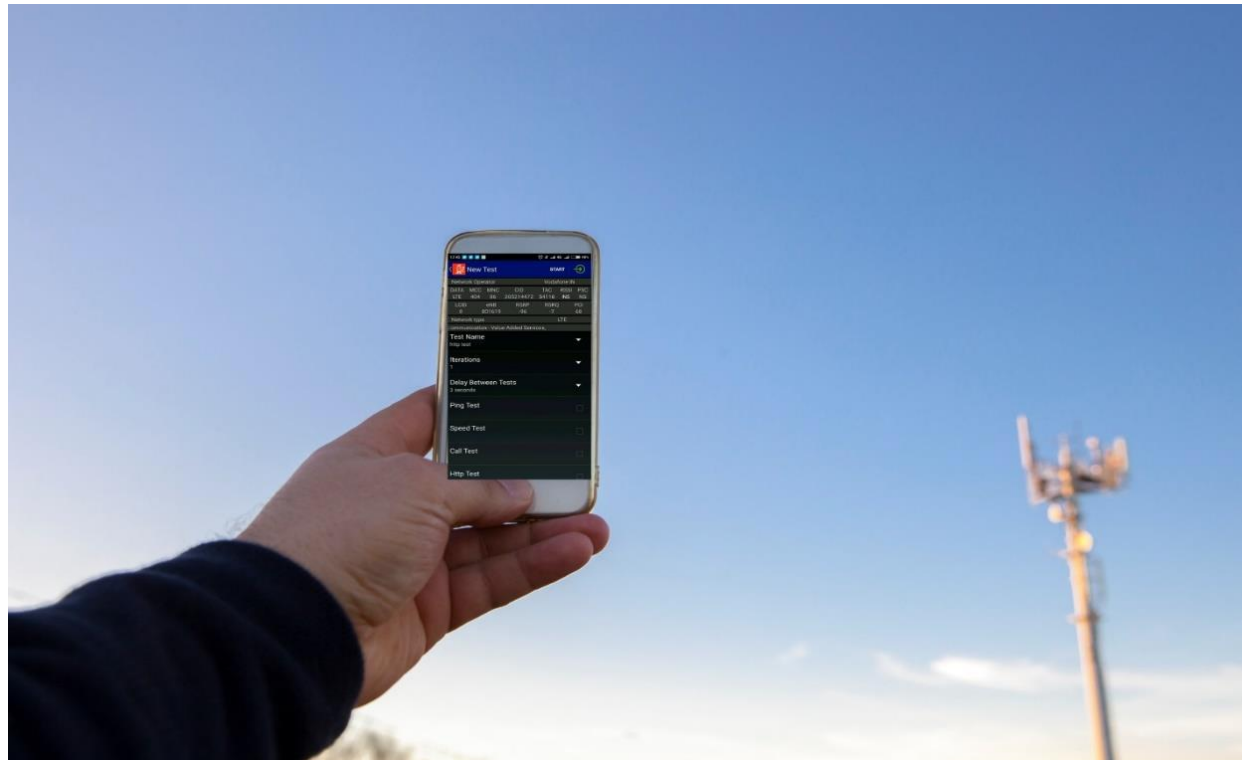


RantCell Cloud Solution measurement and KPI's capabilities data sheet 5G, 4G, 3G and 2G



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Network measurement capabilities on commercial grade Android phone (non-rooted device – In case of 5G Android 10+ phone supported devices only)

Network Measurements	5G	4G	3G	2G
• Operator Name	✓	✓	✓	✓
• MNC	✓	✓	✓	✓
• MCC	✓	✓	✓	✓
• VoLTE supported		✓		
• Data Connectivity Type <ul style="list-style-type: none"> ➤ For 5G – No data and 5G ➤ For 4G – No data and LTE ➤ For 3G – No data, UMTS, HSDPA, HSUPA, and HSPA+ ➤ For 2G – No data, GPRS and EDGE 	✓	✓	✓	✓
• eNbid		✓		
• CID			✓	✓
• LAC			✓	✓
• RSSI (RX Ivl)				✓
• RSCP			✓	
• ECID		✓		
• LCiD		✓		
• TAC		✓		
• PCI		✓		
• RSRQ		✓		
• RSRP		✓		
• SNR		✓		
• CQI (on some devices)		✓		
• NR csiSINR	✓			
• NR ssSINR	✓			
• NR PCI	✓			
• NR csiRSRP	✓			
• NR ssRSRP	✓			
• NR csiRSRQ	✓			

• NR ssRSRQ	✓			
• NR TAC	✓			
• NCI	✓			
• GPS	✓	✓	✓	✓
• ISP	✓	✓	✓	✓
• APN (on some devices)	✓	✓	✓	✓
• PSC			✓	
• RNC ID			✓	
• NR Arfcn	✓			
• EARFCN (Android 10 and above on supported devices only)		✓		
• UARFCN (Android 10 and above on supported devices only)			✓	
• BCCH ARFCN (Android 10 and above on supported devices only)				✓
• BSIC (Android 10 and above on supported devices only)				✓

User QoE KPI's measurement supported on commercial grade Android devices

Network Measurements	5G	4G	3G	2G
Voice Calls				
• VoLTE calls while UE on 5G network	✓			
• Call setup time	✓	✓	✓	✓
• Cell setup average time on multiple tests	✓	✓	✓	✓
• Call setup success rate	✓	✓	✓	✓
• Call drop rate	✓	✓	✓	✓
• Call setup failures	✓	✓	✓	✓
• Call handover rate	✓	✓	✓	✓
• Call failure causes – Setup failed network error, dropped call, weak signal, no network	✓	✓	✓	✓
SMS				
• SMS MO success rate	✓	✓	✓	✓
• SMS MT success rate	✓	✓	✓	✓
• SMS send / receive elapsed time (roundtrip time)	✓	✓	✓	✓
• SMS send failed causes – no network or network error	✓	✓	✓	✓

Data				
• Latency measurement RTT max, RTT min , RTT avg (Ping size variable).	✓	✓	✓	✓
• Ping success rate.	✓	✓	✓	✓
• % of dropped packets based on ping.	✓	✓	✓	✓
• FTP download speeds with session time and file size indicator, percentage of RAN technology type used (2G,3G,4G), signal level capture.	✓	✓	✓	✓
• FTP download average and Peak throughputs.	✓	✓	✓	✓
• FTP upload speeds with session time and file size indicator percentage of RAN technology type used (2G,3G,4G), signal level capture.	✓	✓	✓	✓
• FTP upload average and peak throughputs.	✓	✓	✓	✓
• HTTP download speeds with session time, average, peak.	✓	✓	✓	✓
• HTTP upload speeds with session time, average, peak.	✓	✓	✓	✓
• Failure cases for FTP and HTTP transfers			✓	✓
• Floor plan based indoor walk testing.	✓	✓	✓	✓
Stream Testing (Video Testing)				
• Video Performance Rating: Video performance rating parameter indicates user experienced on video streaming in terms of video rating (Good, Fair and Poor)	✓	✓	✓	✓
• Launch Time: Launch time is time taken by the player to load all web view scripts and files	✓	✓	✓	✓
• Load Time: Initial buffer time is the measurement of the time taken for the player to initialize the video with buffer.	✓	✓	✓	✓
• Stalled Time: Stalled time is total time for which user experienced video stalling while playing	✓	✓	✓	✓
• Stalled Count: Stalled count is the number of times user experienced video stalling while playing.	✓	✓	✓	✓
• Total Video Play Time: Video play time is the amount of time taken to play the video from start to end.		✓	✓	✓
• Resolution Percentage: Video played resolution with percentage (240px, 360px, 480px, 720px, 1080px)		✓	✓	✓
• Current Status: Status of current video i.e. loading, buffering, playing etc.		✓	✓	✓
CSFB				
• CSFB 4G to 3G success rate.		✓		
• CSFB 4G to 3G fall back time.		✓		
• CSFB 4G to 2G success rate.		✓		
• CSFB 4G to 2G fall back time.		✓		
• 3G/2G to 4G reselection time.		✓		

Drive Testing QoE reports				
• GPS capture	✓	✓	✓	✓
• Capture of signal levels and RAN technology type while drive testing.	✓	✓	✓	
• Capture of signal levels and RAN data (EDGE, GPRS) technology type while drive testing.				✓
• Percentage calculation of RAN technology type used while doing drive testing.	✓	✓	✓	✓
• Percentage indicator of signal levels experienced during drive testing.	✓	✓	✓	✓
• Geographical areas where no signals reported.	✓	✓	✓	✓
• Geographical areas where low data connectivity reported.	✓	✓	✓	✓
• Geographical areas where no data connectivity reported.	✓	✓	✓	✓
• Geographical areas where call drops are reported.	✓	✓	✓	✓
• Identification of no data connectivity areas.	✓	✓	✓	✓
• Floor plan based indoor walk testing.	✓			✓
Cell Site Monitoring				
• 24 hours benchmarking on cell site data and voice calls performance (Static testing).	✓	✓	✓	✓
• Active alarm notifications when QoE tests fails.	✓	✓	✓	
• Active alarm notification when cell site is off the air.	✓	✓	✓	✓
• Automated SRAN (2G,3G and 4G) forced selection testing supported on devices supplied by RantCell.			✓	
• Active alarm notifications when QoE tests fails custom thresholds could be set.				✓

iOS Version (Network Measurement Capabilities)

Network Measurements	5G	4G	3G	2G
• GPS capture.				
• MCC, MNC, Operator name.				
• Network Generation type.				
• Data connectivity type (2G, 3G ,4G or Wi-Fi).				
• Upload and download of FTP throughput KPI's.				
• Latency (Ping) tests.				



Wi-Fi network measurement capabilities on commercial grade Android phone (non-rooted device).

Network Measurements	Indoor/outdoor	Speed Test	HTTP test	Video Stream test	Latency
• Wi-Fi SSID	✓	✓	✓	✓	✓
• Wi-Fi BSSID	✓	✓	✓	✓	✓
• Wi-Fi RSSI	✓	✓	✓	✓	✓
• Wi-Fi Frequency	✓	✓	✓	✓	✓
• Wi-Fi Link-Speed	✓	✓	✓	✓	✓
• Wi-Fi AP (meters)	✓	✓	✓	✓	✓