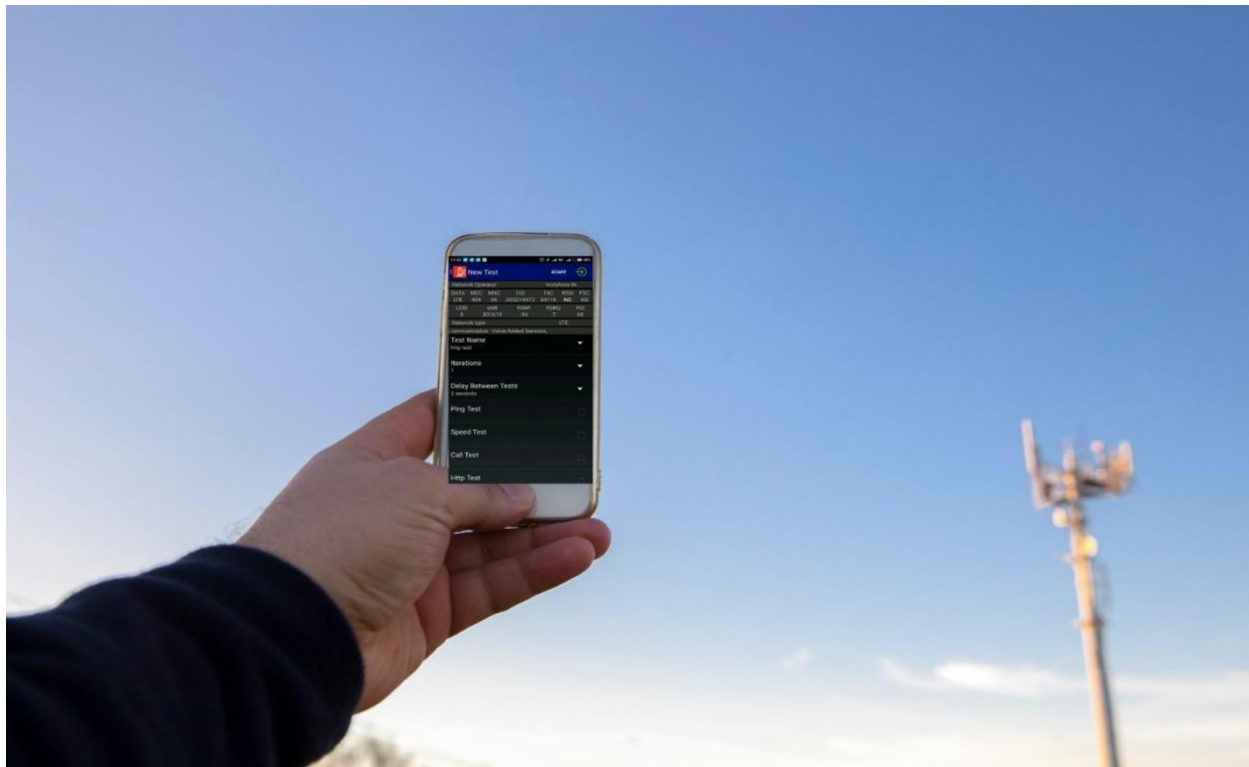# RantCell Cloud Solution measurement and KPIs capabilities data sheet 5G, 4G, 3G, 2G and Wi-Fi

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

Network Measurements	Supported on Android devices				Supported on iOS devices			
	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• Operator Name	✓	✓	✓	✓	✓	✓	✓	✓
• MNC	✓	✓	✓	✓	✓	✓	✓	✓
• MCC	✓	✓	✓	✓	✓	✓	✓	✓
• VoLTE supported		✓				✓		
• Data Connectivity Type								
➢ 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 lvl)				✓				✓
• RSCP			✓				✓	
• ECID	✓	✓						
• LCiD	✓	✓						
• Arfcn								
• TAC	✓	✓						
• PCI	✓	✓						
• RSRQ	✓	✓						
• RSRP	✓	✓				✓		
• SNR	✓	✓						
• CQI (on some devices)	✓	✓						
• NR csiSINR	✓							

Network Measurements	Supported on Android devices				Supported on iOS devices			
	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• NR ssSINR (units – dbm)	✓							
• NR PCI	✓							
• NR csiRSRP	✓				✓			
• NR ssRSRP (units – dbm)	✓				✓			
• NR csiRSRQ	✓							
• NR ssRSRQ (units – dbm)	✓							
• NR gNBID	✓							
• NR BAND	✓							
• NR CID	✓							
• NR TAC	✓							
• NCI	✓							
• GPS	✓	✓	✓	✓	✓	✓	✓	✓
• ISP	✓	✓	✓	✓				
• APN (on some devices)	✓	✓	✓	✓				
• PSC			✓					
• RNC ID			✓					
• NR ARFCN	✓							
• EARFCN (Android 7 and above on supported devices only)		✓						
• UARFCN (Android 7 and above on supported devices only)			✓					
• BCCH ARFCN (Android 7 and above on supported devices only)				✓				
• BSIC (Android 10 and above on supported devices only)				✓				

Note: 5G NSA all parameters are supported in some devices only.

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User QoE KPIs measurement supported on commercial grade Android and iOS devices.

Network Measurements	Supported on Android devices				Supported on iOS devices			
	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
Voice Calls								
• VoLTE calls while UE on 5G network	✓							
• Vo NR calls	✓							
• 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								
	Supported on Android devices				Supported on iOS devices			
Network Measurements	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• 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								
	Supported on Android devices				Supported on iOS devices			
Network Measurements	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• 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	✓	✓	✓	✓	✓	✓	✓	✓
• Failure cases for HTTP transfers	✓	✓	✓	✓				
• Floor plan based indoor walk testing.	✓	✓	✓	✓				

CSFB								
	Supported on Android devices				Supported on iOS devices			
Network Measurements	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• 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.		✓						

Stream Testing (Video Testing)								
	Supported on Android devices				Supported on iOS devices			
Network Measurements	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• 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. Web Response Time		✓	✓	✓				
• Resolution Percentage: Video played resolution with percentage (240px, 360px, 480px, 720px, 1080px)		✓	✓	✓				
• Current Status: Status of current video i.e., loading, buffering, playing etc.		✓	✓	✓				

Web Testing								
	Supported on Android devices				Supported on iOS devices			
Network Measurements	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• Web Response Time: Time Taken to receive the first reply from a web server to client	✓	✓	✓	✓				
• Page Loading Time: Time Taken to load a complete web page on the client-side	✓	✓	✓	✓				
• Total web page load Time: It displays total response time and total page loading time	✓	✓	✓	✓				
• Visible Time: Time Taken by the web to show first partial content on client-side	✓	✓	✓	✓				
• Page Size: Total Data used by the app download the web page	✓	✓	✓	✓				
• Web Performance Rating: It displays the performance score of a web page	✓	✓	✓	✓				

iPerf Testing

Network Measurements	Supported on Android devices				Supported on iOS devices			
	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• iPerf TCP ➢ Transferred Data (Mb)	✓	✓	✓					
• iPerf TCP download average and Peak throughputs.	✓	✓	✓					
• iPerf TCP upload speeds with session time and data transfer	✓	✓	✓					
• iPerf TCP upload average and Peak throughputs	✓	✓	✓					

• iPerf UDP
  ➢ User Defined Bandwidth (Mbps)
  ➢ Jitter
  ➢ Loss Datagram
	✓	✓	✓					

• iPerf UDP download average and Peak throughputs.	✓	✓	✓					
• iPerf UDP upload speeds with session time and data Transfer	In Roadmap	In Roadmap	In Roadmap					
• Floor plan based indoor walk testing.	✓	✓	✓					

Cell Tower Monitoring

Network Measurements	Supported on Android devices				Supported on iOS devices			
	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• 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.				✓				

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Drive Testing QoE Reports								
	Supported on Android devices				Supported on iOS devices			
Network Measurements	5G (SA/NSA)	4G	3G	2G	5G (SA/NSA)	4G	3G	2G
• 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.	✓			✓				

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

Network Measurements	Supported on Android devices.								Supported on iOS devices		
	Indoor/outdoor	Latency	Speed test	HTTP test	Video Stream test	Web Test	iPerf TCP Test	iPerf UDP Test	Indoor/outdoor	Speed Test	Latency
• Wi-Fi SSID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
• Wi-Fi BSSID	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
• Wi-Fi RSSI	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
• Wi-Fi Frequency	✓	✓	✓	✓	✓	✓	✓	✓			
• Wi-Fi Link-Speed	✓	✓	✓	✓	✓	✓	✓	✓			
• Wi-Fi AP (meters)	✓	✓	✓	✓	✓	✓	✓	✓			

Note on iOS devices.

Please note that it's not possible to measure signals levels directly from iOS APIs hence following computation is being made,

For Cellular RSRP/ssRSRP/RSSI/RSCP:
Green (-65dbm) when all 4 signal bars highlighted on iOS device and score is 5 out of 5.
Green (-80dbm) when all 4 signal bars highlighted on iOS device and score is 4 out of 5.
Amber(-90dbm) when 2 signal bars highlighted on iOS device and score is 3 out of 5.
Red (-105dbm) when 2 signal bars highlighted on iOS device and score is 2 out of 5.
Grey (-113dbm) when 1 signal bars highlighted on iOS device and score is 1 out of 5.
Grey (-120dbm) when no signal bars highlighted on iOS device and score is 0 out of 5.

For Wi-Fi RSSI:
Green (-44dbm) when all 4 signal bars highlighted on iOS device and score is 5 out of 5.
Green (-44dbm) when all 4 signal bars highlighted on iOS device and score is 4 out of 5.
Amber (-56dbm) when all 3 signal bars highlighted on iOS device and score is 3 out of 5.
Amber (-60dbm) when 2 signal bars highlighted on iOS device and score is 2 out of 5.
Grey (-80dbm) when 1 signal bars highlighted on iOS device and score is 1 out of 5.
Grey (-90dbm) when 0 signal bars highlighted on iOS device and score is 0 out of 5.