

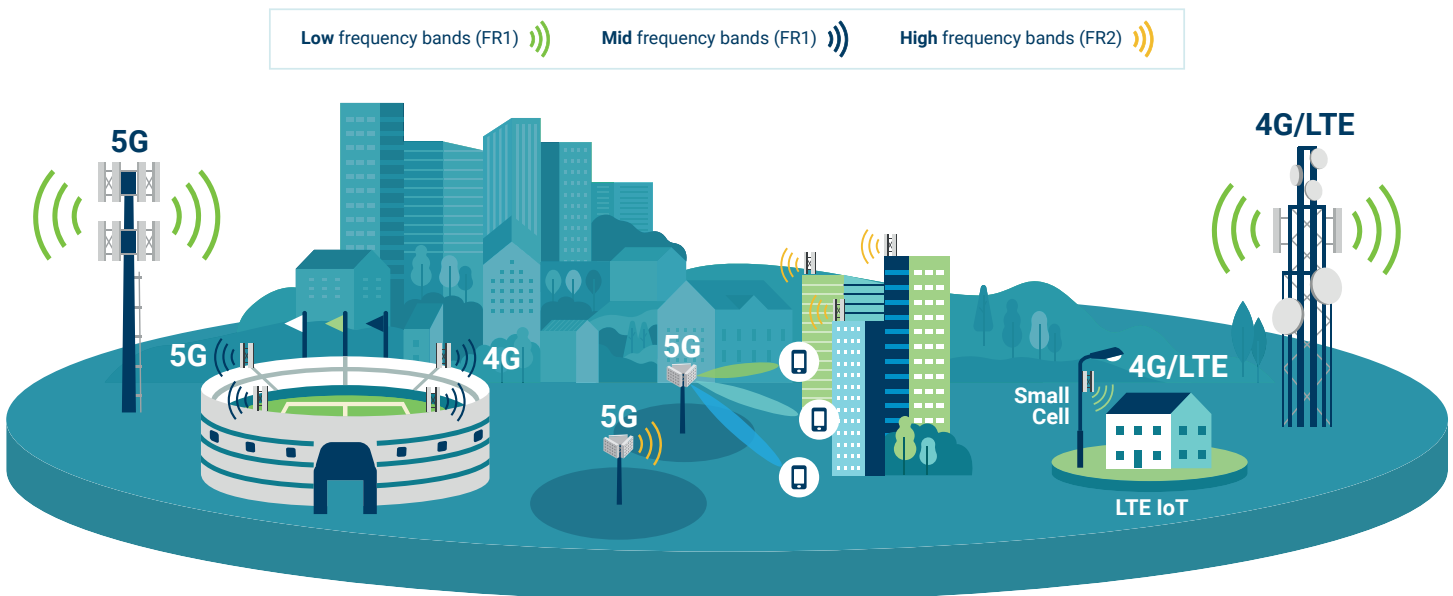
Quickly resolve issues, lower operating costs and improve 5G network performance



5G strategies across 3 spectrum bands

New frequency bands are being introduced to address overcrowding in the sub-6 GHz range, improve bandwidth speeds and ultimately unlock a wider range of 5G use cases. But navigating through all this new spectrum is adding to the complexity— bringing a new set of challenges for planning, deploying and maintaining 5G cell sites. The need for different, innovative test processes will be key for **lowering operating costs, reducing time-to-build, improving site metrics and delivering network quality.**

Let's start by looking at the big three spectrum options:



New 5G spectrum

	FR1: 600 MHz	FR1: CBRS/C-band, 3.3 – 4.2 GHz	FR2: mmWave
Background	UHF TV band repurposed for 5G	Satellite uplink band (3.3 to 4.2 GHz) repurposed for 5G	A new 5G spectrum band is introduced
Technology	<ul style="list-style-type: none"> • Similar to LTE installation with coaxial cable connecting the antenna to the base station • Provides wide area coverage • No beamforming 	<ul style="list-style-type: none"> • Active Antenna Systems (AAS) represents a true fiber-to-the-antenna topology • “Sweet spot” spectrum for 5G providing higher throughput and propagating effectively across relatively large areas • Beamforming and mMIMO technology deployments • Mainly TDD which allows transmission and reception on the same channel 	<ul style="list-style-type: none"> • Requires line-of-sight • Short reach coverage requiring multiple cells (i.e., 1 LTE site = ~20 mmWAVE sites) • Wider bandwidth (up to 400 MHz) • Beamforming and mMIMO technology deployments • Mainly TDD which allows transmission and reception on the same channel
Testing	<ul style="list-style-type: none"> • Fiber inspection • Radio validation (CPRI) • RF over CPRI • Fiber characterization (OTDR) • Transceiver validation • RF spectrum analysis (FR1) 	<ul style="list-style-type: none"> • Timing and synchronization (PTP) • RF absolute time error • Radio validation (eCPRI/Ethernet) • Beam analysis 	RF spectrum analysis (FR2)

5G radio networks: putting things into perspective

Degraded KPIs (RSSI, RTWP)

Trouble tickets can take several days to resolve, significantly impacting QoS and QoE.

High OPEX

Repeat tower climbs are very costly and don't guarantee issue resolution.

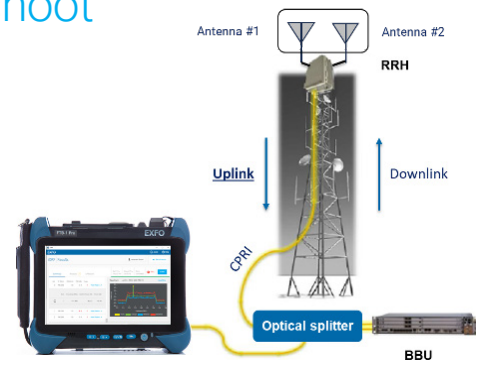
Bad QoS

Network synchronization and timing issues will dramatically impact performance of 5G networks.

Unused test tools

Technicians require 3-5 test tools to get the job done. Learning how to use different tools with unique interfaces is time-consuming.

EXFO's solutions can help you build and troubleshoot 5G cell sites faster, lower your operating cost and deliver first-time-right results:

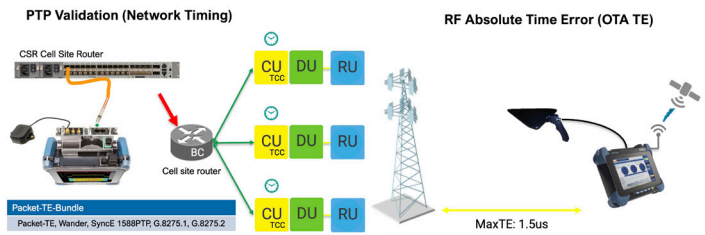


- 1 iORF (intelligent RF spectrum analysis over CPRI)**
 Automated test application generates up to **90% time savings** for frontline technicians and **improves KPIs (RSSI, RTWP) by 20%**.

- 2 Config-less RF spectrum analysis**
 Easy-to-use RF OTA spectrum analyzer simplifies 5G cell site activation and maintenance for technicians at any skill level, **improving MTTR and significantly reducing OPEX**.



- 3 RF absolute time error and PTP validation**
 Accelerate the test process with a **9x faster GNSS lock-time** and achieve nanosecond accuracy to validate timing and synchronization across every element in the 5G network.



- 4 Maximize ROI**
 Cell techs no longer need to carry multiple test sets to get the daily job done. **ONE complete solution** with a simple-to-use interface helps take the guesswork out of testing and accelerates deployment.

FTB 5GPro
Complete solution for 4G and 5G networks

- RF spectrum analyzer
- RF spectrum over CPRI
- Timing and synchronization
- Multi-protocol testing
- Transceiver validation
- Fiber characterization
- Fiber inspection
- Transceiver support (up to 100G)

Learn more about the FTB 5GPro
EXFO.com/FTB5GPro

