



CapacityAdvisor™ 9400 for LTE

Measuring user experience with real-world traffic generation

The Viavi Solutions™ CapacityAdvisor product family provides advanced load generation for 3G and 4G networks, giving customers an unmatched ability to test equipment and services under realistic traffic loads in their labs. CapacityAdvisor enables LTE network performance and capacity testing where coverage, capacity, and performance are load-dependent. Testing under load with the CapacityAdvisor 9400 LTE system ensures optimal wireless network performance to give end users the best possible experience.

Key Applications

- Functional feature tests — quantify performance of LTE subsystems, measured at the Uu interface
- System performance tests — with mixed data applications measuring maximum data throughput, packet latency, and jitter, among other things, under dynamic RF environments
- Call model tests — to verify system performance under real-world traffic scenarios
- Stress testing under traffic load — to measure the impact on RF resources, scheduler performance, as well as the integrity of signaling under load
- Data application performance tests — to measure quality of service (QoS) and its impact on data throughput for mixed data traffic for new applications such as VoLTE
- VoLTE-specific performance tests — utilize the R-Factor MOS to characterize changes in VoLTE performance when other VoLTE users and Internet traffic are present
- Scheduler analysis — to measure scheduler performance and analyze resource allocation
- Mobile perspective — to provide logging and performance analysis
- Deterministic analysis — unlike mobile-based test beds, the capacity test provides repeatable and deterministic performance.

CapacityAdvisor 9400 for LTE helps bring new products and services to market faster, with better quality, and at a reduced cost.

Key Benefits

- Accelerated network life-cycle testing
- Faster time to revenue and reduced test-cycle time
- Repeatable and deterministic test behavior
- Find defects earlier in the development cycle
- Higher-quality products to market in less time
- Ultra-high terminal density in a server footprint
- Easy-to-define real-world traffic models
- Low-maintenance platform

Key Features

- 6000 simultaneous data sessions per baseband unit
- Eight 2x2 and 4x2 MIMO sectors per baseband unit
- Support for 5, 10, 15, and 20 MHz bandwidths
- Support for all major FDD and TDD bands
- LTE-Advanced carrier aggregation
- UE Category 6 transfer rates of 300 Mbps downlink/50 Mbps uplink
- Logging at multiple protocol layers
- Performance analysis tools
- Proven SDR platform
- Common user interface supporting concurrent LTE/UMTS load
- Virtual drive-test environment

Specifications

System Configuration

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|--|
| Up to 6000 UEs per baseband unit |
| OFDM 2x2 and 4x2 MIMO |
| 1 to 8 MIMO sectors |
| 5, 10, 15, and 20 MHz |
| Up to 150 Mbps downlink throughput at 20 MHz bandwidth |
| LTE-Advanced carrier aggregation (PCC + nCC aggregation) |
| Dynamic downlink SCC activation/deactivation |
| Handover using intuitive drive-test map |
| User-configurable mix of R8 and R10 UEs on each PCC |
| User-configurable RF bandwidth and band pairings for PCC and SCC |
| High-Capacity VoLTE Solution |
| 900+ VoLTE UE per sector |
| Up to 8 DRB per UE across multiple APN |

Traffic Model

Traffic Mix

| |
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| Ping |
| UDP streaming |
| FTP file transfer |
| HTTP browsing |
| SMTP/POP3 e-mail |
| Custom application development available |
| VoLTE |
| SIP/RTP |

STT Identities and Grouping

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|----------------------------------|
| Create groups from USIM database |
| Coordinated or random behavior |

Supports Multiple RAB/SRB Combinations

SDR Test Terminal (STT) Control

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| GUI-based test case definition |
| Create virtual propagation environment, virtual pilot strength/path loss within a drive test map ; includes BLER and SINR degradation to trigger channel performance enhancers in the eNodeB such as TTI bundling |
| Control of STT mobility including support for handover |
| Test termination conditions and triggers |
| Time-based |
| Until statistic achieved |
| Until pass or fail condition achieved |
| Terminal ramping based on: |
| Number of terminals (control of single or multiple STTs in group) |
| Ramp up/down period |
| Statistical or time-based conditions under which ramping is considered complete |

Air Interface/Protocols

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|----------------|
| R8 LTE Dec 09 |
| R10 LTE Dec 12 |

Statistics Collection

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| Logging at PHY, MAC, RLC, PDCP, RRC, NAS, and application |
| Statistical analysis by STT group, by sector carrier, or eNodeB |
| Statistics (total counts, averaged) such as: |
| Session originations |
| Registrations |
| Access attempts |
| Network release |
| Terminal release |
| Soft handover |
| Call control |
| Data application |
| Connection reconfiguration |

Management and Administration

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| GUI-based workbench (Windows 7) |
| Configure eNodeB connections |
| Configure system resources |
| Log and storage management |
| Import/export and group USIM records |
| Manage user accounts and software licenses |
| Backup/restore test cases and system configurations |
| Automation tool SDK |

RF Bands

| Band | Uplink (UL) (MHz) | Downlink (DL) (MHz) | Band | Uplink (UL) (MHz) | Downlink (DL) (MHz) |
|------|-------------------|---------------------|------|-------------------|---------------------|
| 1 | 1920 to 1980 | 2110 to 2170 | 23 | 2000 to 2020 | 2180 to 2200 |
| 2 | 1850 to 1910 | 1930 to 1990 | 24 | 1625.5 to 1660.5 | 1525 to 1559 |
| 3 | 1710 to 1785 | 1805 to 1880 | 25 | 1850 to 1915 | 1930 to 1995 |
| 4 | 1710 to 1755 | 2110 to 2155 | 26 | 814 to 849 | 859 to 894 |
| 5 | 824 to 849 | 869 to 894 | 27 | 807 to 824 | 852 to 869 |
| 7 | 2500 to 2570 | 2620 to 2690 | 28 | 703 to 748 | 758 to 803 |
| 8 | 880 to 915 | 925 to 960 | 30 | 2305 to 2315 | 2350 to 2360 |
| 9 | 1749.9 to 1784.9 | 1844.9 to 1879.9 | 33 | 1900 to 1920 | 1900 to 1920 |
| 10 | 1710 to 1770 | 2110 to 2170 | 34 | 2010 to 2025 | 2010 to 2025 |
| 11 | 1427.9 to 1447.9 | 1475.9 to 1495.9 | 35 | 1850 to 1910 | 1850 to 1910 |
| 12 | 699 to 716 | 729 to 746 | 36 | 1930 to 1990 | 1930 to 1990 |
| 13 | 776 to 787 | 746 to 757 | 37 | 1910 to 1930 | 1910 to 1930 |
| 14 | 788 to 798 | 758 to 768 | 38 | 2570 to 2620 | 2570 to 2620 |
| 17 | 704 to 716 | 734 to 746 | 39 | 1880 to 1920 | 1880 to 1920 |
| 18 | 815 to 830 | 860 to 875 | 40 | 2300 to 2400 | 2300 to 2400 |
| 19 | 830 to 845 | 875 to 890 | 41 | 2496 to 2690 | 2496 to 2690 |
| 20 | 832 to 862 | 792 to 821 | 42 | 3400 to 3600 | 3400 to 3600 |
| 21 | 1447.9 to 1462.9 | 1495.5 to 1510.9 | 43 | 3600 to 3800 | 3600 to 3800 |
| 22 | 3410 to 3500 | 3510 to 3600 | 44 | 703 to 803 | 703 to 803 |



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