

R&S®CMX500 - 5G NR RADIO COMMUNICATION TESTER



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CMX500 5G NR Signaling Tester

Future proof 5G NR signaling test platform

Independent Operating System (Linux)

Modular and scalable HW-Architecture

20 Gbps+ End-to-End IP Data Performance capability

FR2 Multiband Remote Radio Support (24 – 43.5GHz)

Single Web-based GUI for RF, Protocol and App Tests

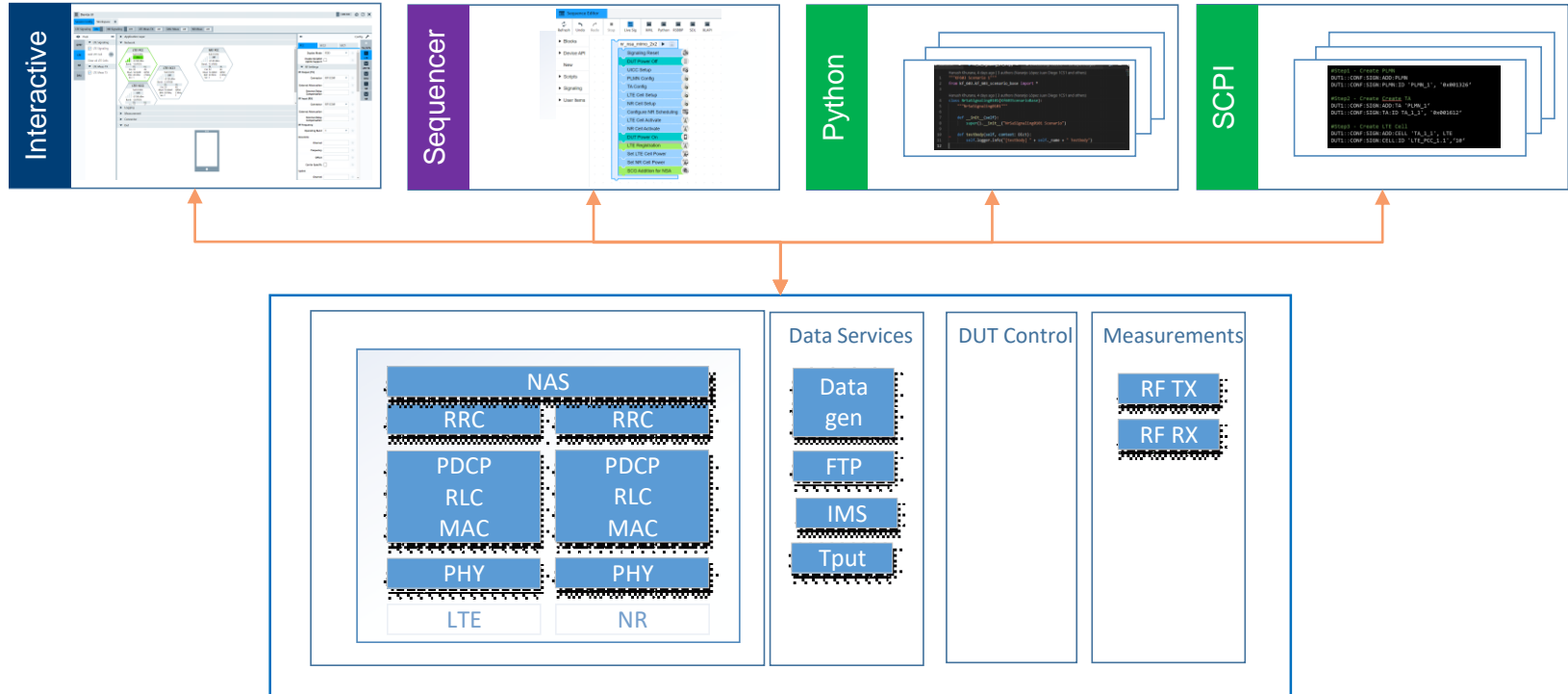
LTE Anchor support for up to 8CC LTE, 8x4 DL MIMO and 1024QAM (with CMW500)

UNIFIED USER INTERFACE FOR PROTOCOL, RF AND APPLICATION TESTING



CUSTOMER INTERFACES

REMOTE CONTROL

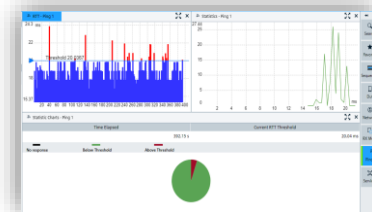
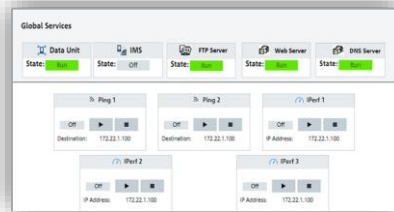


R&S®CMX500 APPLICATION TEST



Description:

- ▶ Fully integrated „In a Box“ IP data testing environment for 5G NR FR1/FR2 NSA and SA testing
- ▶ Optimized IPv4/IPv6 and Server environment for high throughput and low latency verification
- ▶ IP measurements and integrated tooling to support 5G E2E IP throughput test and latency measurement use-cases
- ▶ “Ready to use” and fully integrated application servers for testing common internet services e.g. File-Transfer, Web-Browsing, IMS-Services, Media-Streaming...
- ▶ “Simple to use and easy to configure” by **R&S®CMsquares** interactive mode or via remote (SCPI & XLAPI)



R&S®CMX500 APPLICATION TEST

Add measurements to Workspace

- Ping
- Iperf
- Throughput

Configure IP settings and servers

Services Configuration

Global Services

Data Unit	DNS	IMS	FTP	HTTP
State: Run	State: Run	State: Run	State: Run	State: Run

Ping 1
Destination: 172.22.1.100

Ping 2
Destination: 172.22.1.100

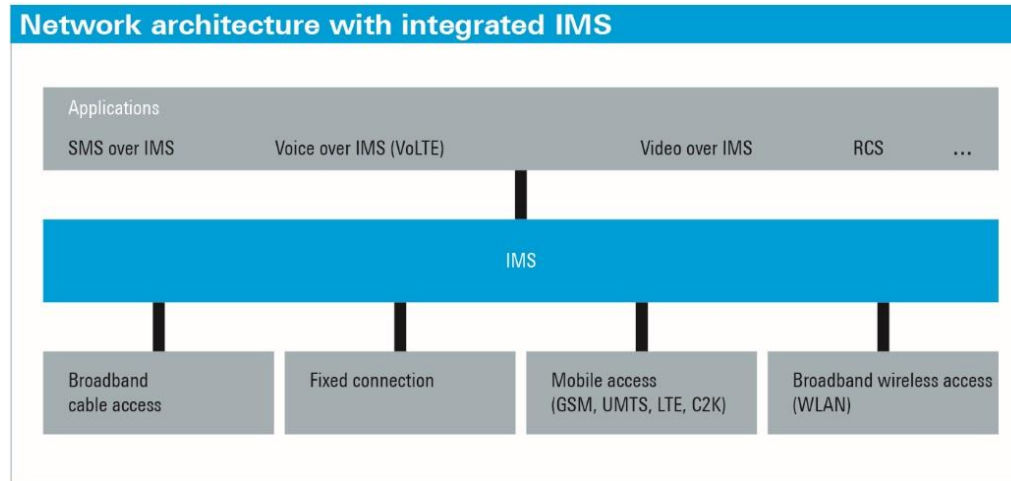
IPerf 1
IP Address: 172.22.1.100

IPerf 2
IP Address: 172.22.1.100

INTRODUCTION IMS – IP MULTIMEDIA SUBSYSTEM

DEFINITION

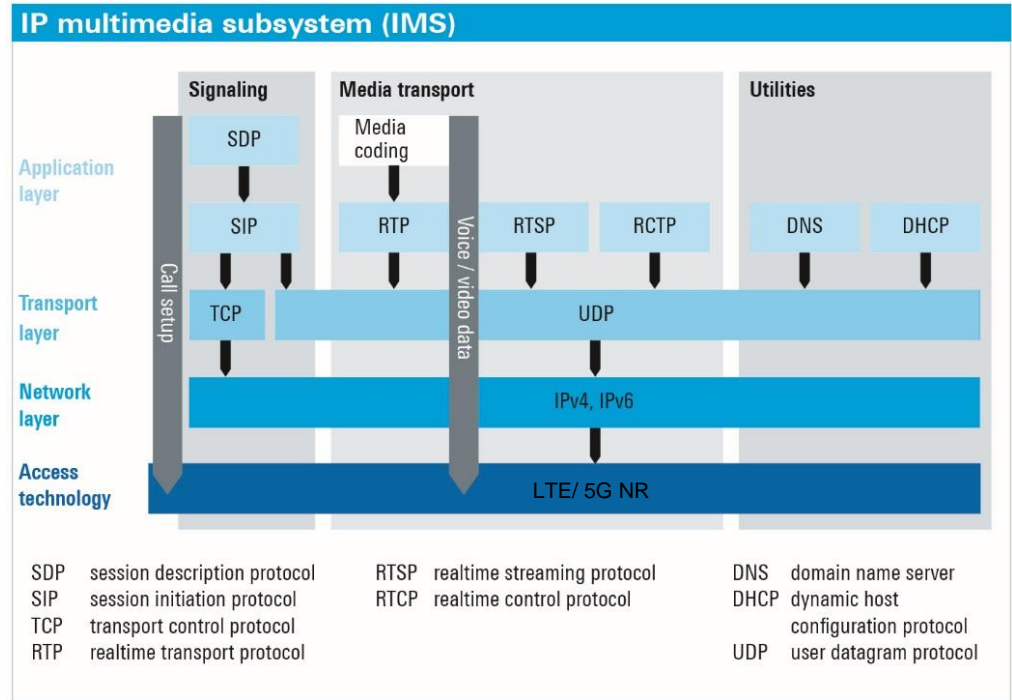
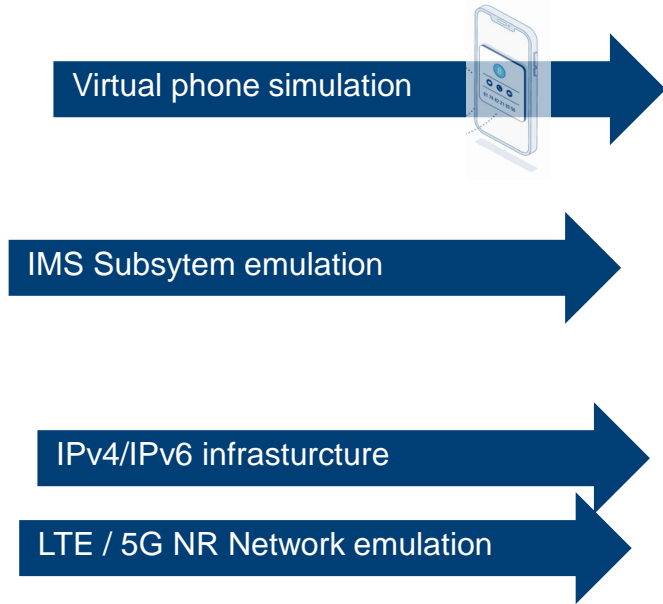
- ▶ IMS is the enabler for VoLTE & VoNR, SMS over IMS and value adding services.



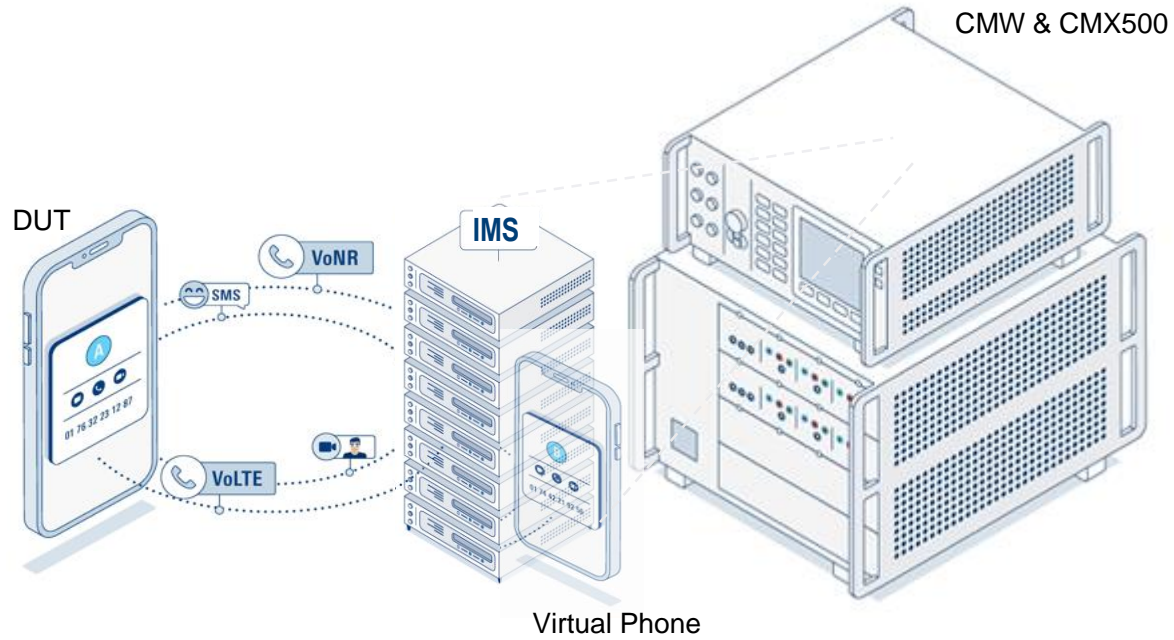
- ▶ IMS is a global access-independent and standards-based IP connectivity and service control architecture that enables various types of multimedia services to end-users using common Internet-based protocols.

IMS PROTOCOL STRUCTURE

TEST SOLUTION REQUIREMENTS



TEST SETUP



IMS SERVER

Use Case:

- ▶ Verification of IMS related functions e.g. registration procedures or voice/video calls
- ▶ Configuration of the internal IMS server
 - Switch ON/OFF
 - Configure parameters:
 - e.g. IP Sec Encryption Algorithm
 - Integrity Algorithm a.o.
 - Perform Voice and Video calls
 - ...

Services Configuration

DAU Config DNS IMS

Call Settings

Network Settings

Authentication Scheme: AKA V1

IPsec Enabled:

IPsec Encryption Algorithm: Null Encryption

IPsec Integrity Algorithm: Auto

TCP Keep Alive: ON

UDP TCP Threshold: Default 1300

Timer T1: Default 2000

Media Endpoint: Internal Loopback

Virtual UE

Signaling Type: Without Preconditions

Dedicated Bearers:

Video Codec: H.264

Video Attributes: [Red bar]

Audio Codec: AMR-WB

AMR-WB Alignment: Bandwidth Efficient

Modes [kb/s]	06.60 <input checked="" type="checkbox"/>	08.85 <input checked="" type="checkbox"/>	12.65 <input checked="" type="checkbox"/>
	14.25 <input checked="" type="checkbox"/>	15.85 <input checked="" type="checkbox"/>	18.25 <input type="checkbox"/>
	19.85 <input checked="" type="checkbox"/>	23.05 <input checked="" type="checkbox"/>	23.85 <input checked="" type="checkbox"/>

IMS

State: Run

Internal Loopback

External DAU USB sound card

Internal Loopback

IP Forward

Audio Codec: AMR

Alignment: Bandwidth Efficient

Modes [kb/s]	4.75 <input type="checkbox"/>	5.15 <input type="checkbox"/>	5.90 <input type="checkbox"/>	6.70 <input type="checkbox"/>
	7.40 <input type="checkbox"/>	7.95 <input type="checkbox"/>	10.2 <input type="checkbox"/>	12.2 <input type="checkbox"/>