



# Testing Fixed-Wireless Gateways with an Automated Test Environment

The webinar will begin at :02 past the hour



Marouan Benabdellah-Chaouni  
Amarisoft



Matthew Langlois  
QA Cafe

# Why this, why now?

- More fixed-wireless gateway products in the market
- CDRouter users adding to their portfolio
- No easy way to test during development!
- QA Cafe and Amarisoft working together



# What is CDRouter?

- The industry standard test platform for broadband gateways and Wi-Fi routers
- Used by hundreds of companies worldwide
- Thousands of pre-defined test cases
- Fully-automated and integrates with CI/CD systems



**Where does  
Amarisoft fit in?**



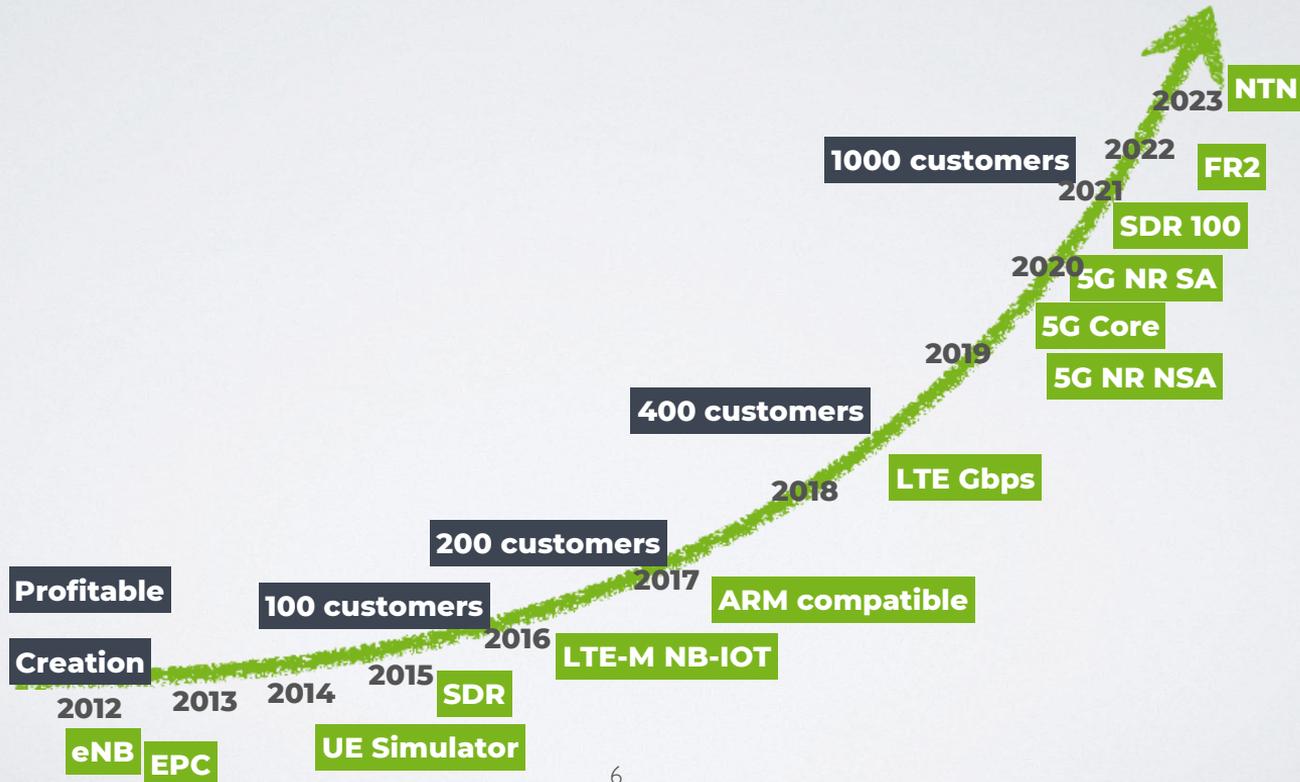


**From the lab to the field**

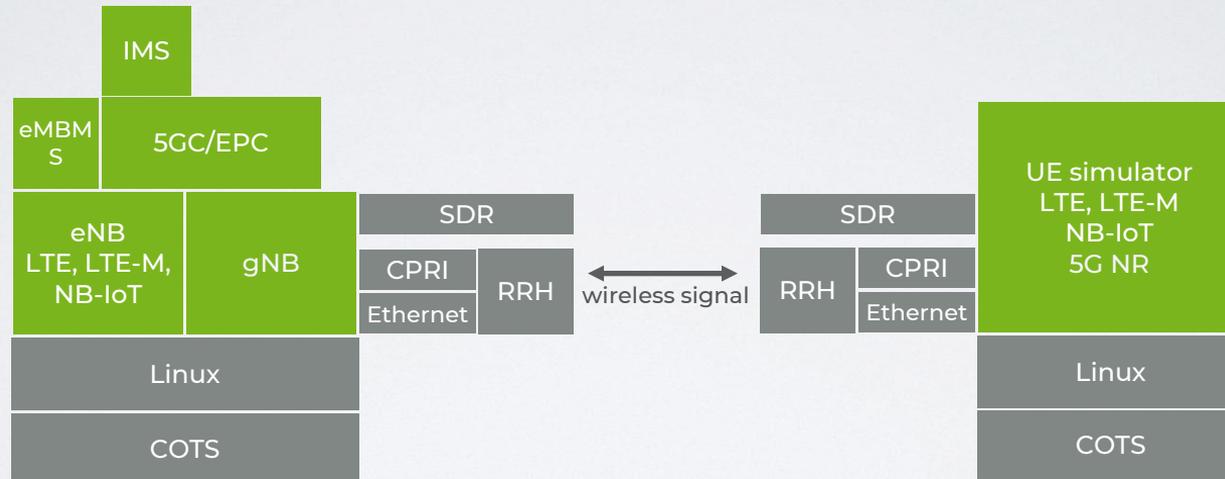
**Feb 2023**



**Intro**



### Technology

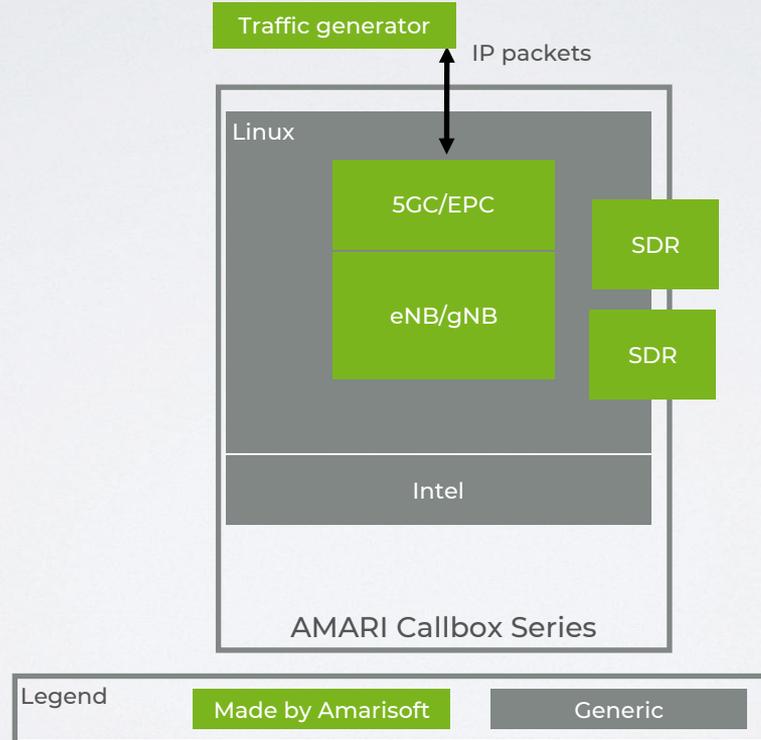


Legend

Software

Generic Hardware

## Test & Measurement



## Test & Measurement

100% SW	▶	High quality & Affordable products
OPEN	▶	Logging & Measurement Easy configuration & automation
LATEST 3GPP RELEASES	▶	Early access to 3GPP features
END TO END	▶	All in one equipment
VERSATILE	▶	Live deployment & Test features

## Test & Measurement



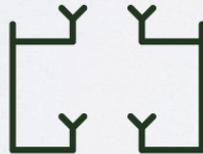
Up to 500 UEs



200 Mbps  
75 Mbps



eDRX/PSM



mimo2x2

VOLTE



[Download Datasheet](#)

## Test & Measurement



Up to 1000 UEs



600 Mbps  
150 Mbps



Handover

Configuration examples:  
3 LTE 20 cells 2x2  
5G NSA 50MHz 2x2 + 10MHz LTE anchor  
5G SA 50MHz 2x2

**VOLTE**



eMBMS

**lte**

**LTE-M**

**NB-IoT**

**5G**

[Download Datasheet](#)



## Test & Measurement



Up to 1000 UEs



3 Gbps in DL



Handover

2 x NR 100 MHz 4x4

mmWave option available

**VOLTE**



eMBMS



[Download Datasheet](#)

## Test & Measurement



Up to 1000 UEs



5 Gbps in DL  
500 Mbps in UL



Handover

4 x NR 100 MHz 4x4

mmWave option available

**VOLTE**



**lte**  
**LTE-M**  
**NB-IoT**  
**5G**

[Download Datasheet](#)



## Test & Measurement

	Mini	Classic	Advanced	Ultimate
<b>Size</b>	7.8cmx20cmx25cm	30cmx27cmx35cm	47cmx24 cmx53cm	47cmx24 cmx53cm
<b>Weight</b>	2,2 Kg	11 Kg	14 Kg	14 Kg
<b>CPU</b>	Intel i3 Core	Intel i7 Core	Intel i9 Core	Intel i9 Core
<b># PCIe SDR</b>	1 (50MHz 2x2)	3 (50MHz 2x2)	2 (100MHz 4x4)	4 (100MHz 4x4)
<b>Max DL TP</b>	200 Mbps	600 Mbps	5 Gpbs	5 Gpbs
<b><math>\Sigma(\text{Bi} \cdot \text{Li})</math></b>	40	120	800	1600
<b>LTE config ex.</b>	20MHz 2x2	3 x 20MHz 2x2	5 x 20MHz 4x4	5 x 20MHz 4x4
<b>5G NSA config ex.</b>	-	50MHz 2x2 + 10 MHz 2x2	100MHz 4x4 + 20MHz 4x4	4x100MHz 4x4
<b>5G SA config ex.</b>	20MHz 2x2	3x20MHz 2x2	2 x 100MHz 4x4	4 x 100MHz 4x4

Bi is the bandwidth in MHz of cell i - Li is the number of dl mimo layer for cell i



[www.amarisoft.com](http://www.amarisoft.com)



[sales@amarisoft.com](mailto:sales@amarisoft.com)



[www.linkedin.com/company/amarisoft](http://www.linkedin.com/company/amarisoft)



<https://twitter.com/amarisoft>

### **HQ in Paris**

16-18 Rue Rivay,  
92300 Levallois Perret  
**FRANCE**

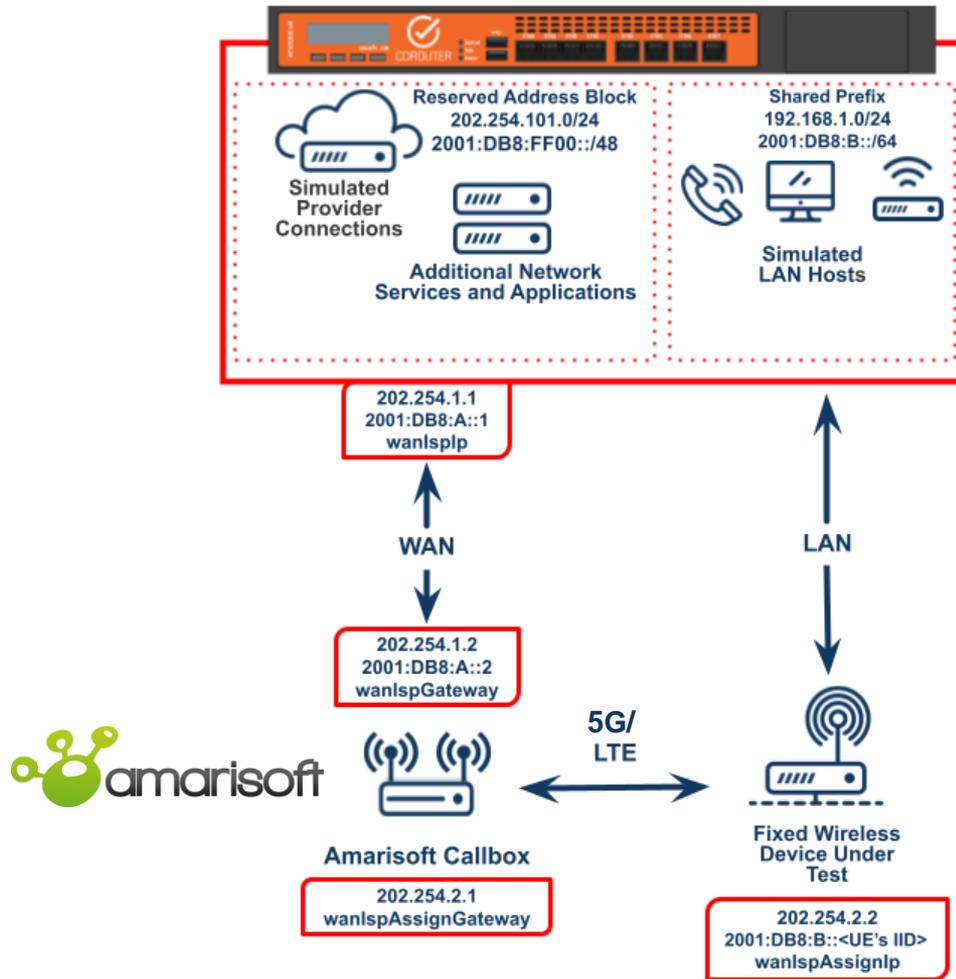
### **South of France Office**

1300 route des Crêtes,  
06560 Sophia Antipolis  
**FRANCE**

**Let's look at the  
test setup**

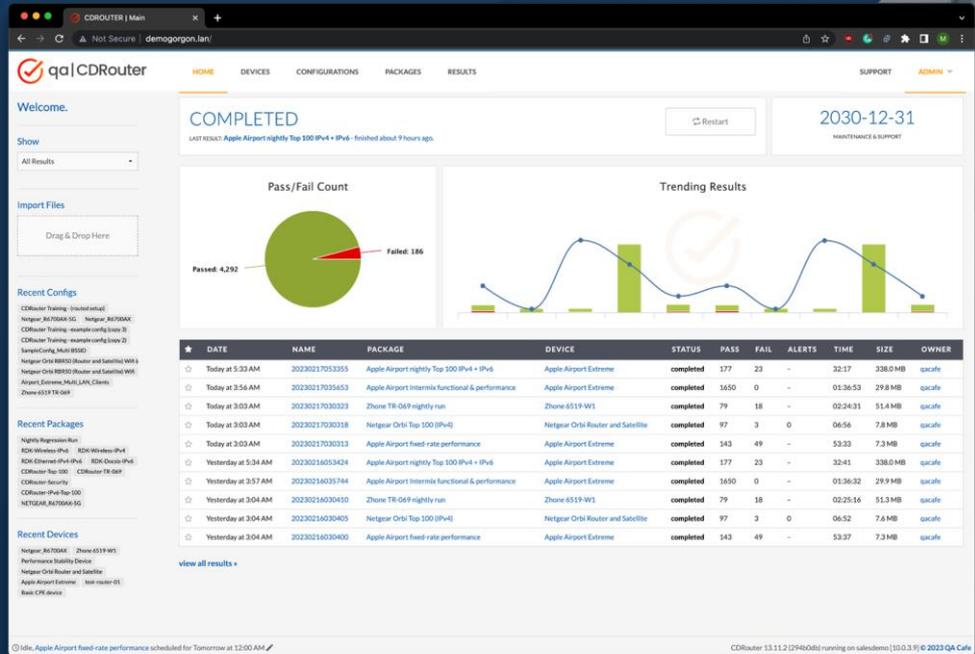


# CDRouter/ Amarisoft Test Setup



# What automated tests can I do?

- ✓ Functional
- ✓ Performance
- ✓ Stability
- ✓ Security
- ✓ Certification



# CDRouter functional test coverage

- Core IPv4
- Core IPv6
- Management technologies
  - SNMP, CWMP, and USP
- Wi-Fi, LAN client scaling, & guest mode
- Core protocols
  - DNS, DHCP, multicast, and [more!](#)



# CDRouter performance test coverage

- Single client & multi client tests
- Configured rate & fixed rate tests, up to 10Gbps
- Multiple traffic profiles
  - Multicast/unicast, IPv4/IPv6, TCP/UDP, etc.
- Upstream, downstream, & LAN-to-LAN
- Highly configurable!
  - Duration, streams, etc.

# Performance testing with CDRouter has many advantages

- All tests have clear **PASS** or **FAIL** results based on user defined thresholds or pre-defined test metrics.
- Tests are performed within a realistic environment with multiple WAN services and LAN clients enabled.
- Performance data and visualizations make it easy to identify regressions.
- Advanced test execution features make stability testing possible **and** easy.

# Stability & security testing with CDRouter

- Stability testing
  - Mixed functional + performance testing
  - Looped for longer durations
- Security features
  - Cloud access for UEs and DUTs using ICS
  - Network discovery & port scanning with Nmap
  - Traffic analysis with Suricata



# Certification & open source testing with CDRouter



- Certification
  - BBF.069 (CWMP)
  - BBF.369 (USP)
- Open source
  - prpl
  - RDK-B

# Caveats

- The Callbox manages all addressing of the UE/DUT within this environment. Since CDRouter runs in static mode on the WAN, certain tests associated with dynamic WANs such as DHCP, PPPoE, etc. are not applicable and cannot be performed in this environment.
- The maximum throughput of the FWA test environment is determined by the capabilities and configuration of the Callbox.

# How do I get started?

1. Talk to Amarisoft to determine which Callbox is right for you
2. Connect your UE to the Callbox and optimize the FWA config with the help of Amarisoft support
3. Connect the Callbox to CDRouter
4. Configure the Callbox and CDRouter
5. Select and run your tests!



# Resources

- ✓ [support.qacafe.com/cdrouter/knowledge-base/amarisoft](https://support.qacafe.com/cdrouter/knowledge-base/amarisoft)
- ✓ [www.amarisoft.com/products/test-measurements/amari-lte-callbox/](https://www.amarisoft.com/products/test-measurements/amari-lte-callbox/)
- ✓ [www.qacafe.com/best-practices-for-testing-wi-fi-routers-aps-and-mesh-products/](https://www.qacafe.com/best-practices-for-testing-wi-fi-routers-aps-and-mesh-products/)
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