MX-ORS: 5G/6G OPEN RAN STUDIO

Product Name
MX-ORS

Version
1.2

Usecases
Digital Twin, Education, Testing, PoC

OVERVIEW

BubbleRAN **MX-ORS** is a **production-grade cloud-native** environment allowing users to **seamlessly design, operate, automate and experiment** an emulated end-to-end 3GPP and O-RAN **standard-compliant network** with edge services, at scale.

User Equipment and radio channels in **MX-ORS** are **emulated**, making it **ideal** for rapid prototyping, validation, measurement, and what-if analysis in a realistic controlled environment with **guaranteed reproducibility.**

MX-ORS works out the challenge of **multiple parallel 5G network digital twins at scale** required by the public operators to:

➡ Realize a **predictive maintenance** and planning
➡ **Gain powerful insights** from a 5G-powered digital twin
➡ **Automate and optimize** 5G networks

ADVANTAGES

➡ **OPTIMIZE**
Costs of building, operating and maintaining a testbed

➡ **MINIMIZE**
The time and effort required to go from idea to PoC

➡ **ENABLE ADVANCED RESEARCH**
Advanced 5G/6G research thanks to state-of the art features:
- Cloud-native 5G
- Intent-based networking (IBN)
- Artificial intelligence (AI)
- Generative AI (GenAI) techniques including Large Language Models (LLMs)

INCLUDED IN THE SOFTWARE PACKAGE:

Telco Cloud	5G Network	O-RAN SMO/OAM	O-RAN NEAR-RT RIC and NON-RT-RIC
• Telco-Optimized Kubernetes • Hybrid public and private clouds	• OpenAirInterface 5G gNB/CU/DU • srsRAN 5G gNB/CU/DU • Simulated O-RU and Channel Model	• Resource detection and discovery (day 0) • Deploy (day 1) • Test (day 2) • Release (day 2) • Upgrade (day 2)	• E2AP v2/v3 • A1AP v2
• Synchronization • Auto-device discovery, • Optimized data plane • eBPF observability	• OpenAirInterface 5G Core • Open5Gs core	• Provisioning (day 0) • Configuration (day 1) • Reconfiguration (day 2)	• O-RAN KPM E2SM • O-RAN RC E2SM • O-RAN CCC E2SM • BubbleRAN Slice Control E2SM • BubbleRAN Trafic Control E2SM • BubbleRAN Sensing E2SM
	• OpenAirInterface 5G soft UE • srsRAN soft UE	• Fault management • Deep insights with full observability including monitoring, log processing, metrics, and alarms	• Data collections xApps • Status monitoring xApp • RAN slicing xApp • RAN Traffic Control xApp • RAN reconfiguration xApp • QoS xApp • Handover Control xApp
		• Zero touch operations • Auto-pilot • GenAI/AI optimization	• FlexPolicy rApp • FlexMon rApp • FlexData rApp
			• Portfolio of xApps in source code • Portfolio of rApps in source code

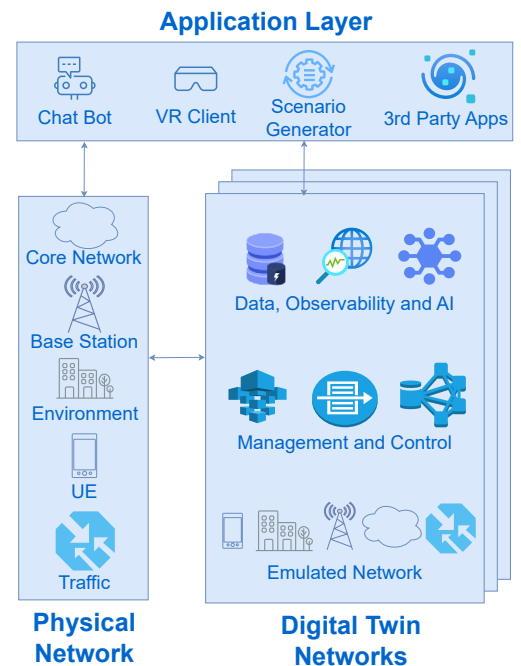**Product Name**
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FROM EDUCATION TO LAB ENVIRONMENT

MX-ORS FOR PUBLIC OPERATORS   **Multiple parallel large networks**

- Easy large scale deployment of Public Digital Twin
- Possibility to deploy multiple parallel Digital Twin networks for the same physical network enabling investigation of several possible scenarios boosting performance
- Easy Observation and Management of both Digital Twin (DT) and Physical Network (PN)
- Hybrid Model-Driven-Data-Driven (MD-DD) Approach offering flexibility as well as proactive and generative capabilities
- Improvement of future networks by our unique **Time travel** capability allowing recreation of network states from the past to perform root case analysis and explore what-if scenarios

Application Layer

Chat Bot   VR Client   Scenario Generator   3rd Party Apps

Core Network

Base Station

Environment

UE

Traffic

Physical Network

Data, Observability and AI

Management and Control

Emulated Network

Digital Twin Networks

MX-ORS FOR EDUCATION   **Large number of small networks**

- Facilitate lab-based learning with realistic network setups
- Enabling highly accurate realistic simulations/emulations
- Comprehensive lecture notes and lab courses available
- Allowing users to perform full lifecycle operations from "Day 0 to Day n"
- Make operations on an end to end 3GPP and O-RAN compliant network
- Users and applications tailored to concerned use case

Design & Develop   **Network & Usecase**   **Deploy & Customize**   **Measure & Test E2E**   **Analyze & Evaluate**