



All things wireless ●

# Digital Twin rApp

# Rimedo Labs: Digital Twin rApp

## Brief introduction

The Rimedo Labs Digital Twin rApp (DT-rApp) creates a high-fidelity virtual replica of your 4G/5G RAN using live network data, 3D urban models, and ray tracing. It delivers a risk-free sandbox to evaluate AI/ML optimizations, test network resilience, and generate synthetic datasets for advanced algorithm training under flexible scenarios.

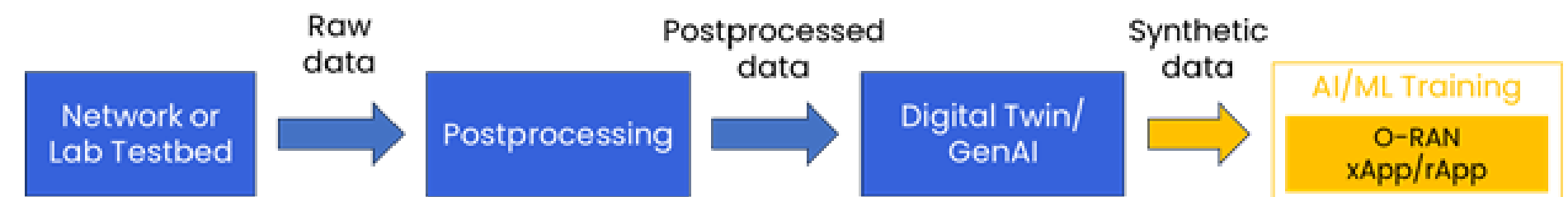
## Setting the scene

As 5G networks grow increasingly complex, operators are turning to automated, AI-driven rApps to optimize capacity and efficiency. However, deploying untested configurations into a live Radio Access Network carries significant operational risks, potentially degrading the user experience. Traditional testing lacks the scale and realism of dynamic, real-world environments. Operators urgently need a standardized, secure methodology to validate these advanced algorithms, understand their interactions, and assess overall network resilience before they are rolled out commercially. **Key requirement is to remain statistical properties of live-network KPIs, its topology, and propagation environment.**

## Introduction to solution

The Rimedo Labs Digital Twin rApp (DT-rApp) directly answers this need by operating as a high-fidelity software representation of the physical network within the Non-RT RIC. Utilizing EIAP interfaces, it ingests and post-processes live performance metrics to recreate precise traffic models. By enhancing this data with realistic 3D urban models and advanced ray tracing tools, the DT-rApp transforms static datasets into a dynamic, intelligent virtual environment, enabling operators to analyze network behavior under an infinite array of scenarios.

The **Ericsson Intelligent Automation Platform (EIAP)** provides Service Management and Orchestration (SMO) for Open RAN and further enhances openness, network management, and automation by supporting multi-vendor and multi-technology RAN environments. EIAP is supported by open interfaces and the industry's leading Software Development Kit (SDK) to enable an ecosystem of developers with all the capabilities needed to innovate, build, validate, share and operate rApps



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## Explanation of the solution

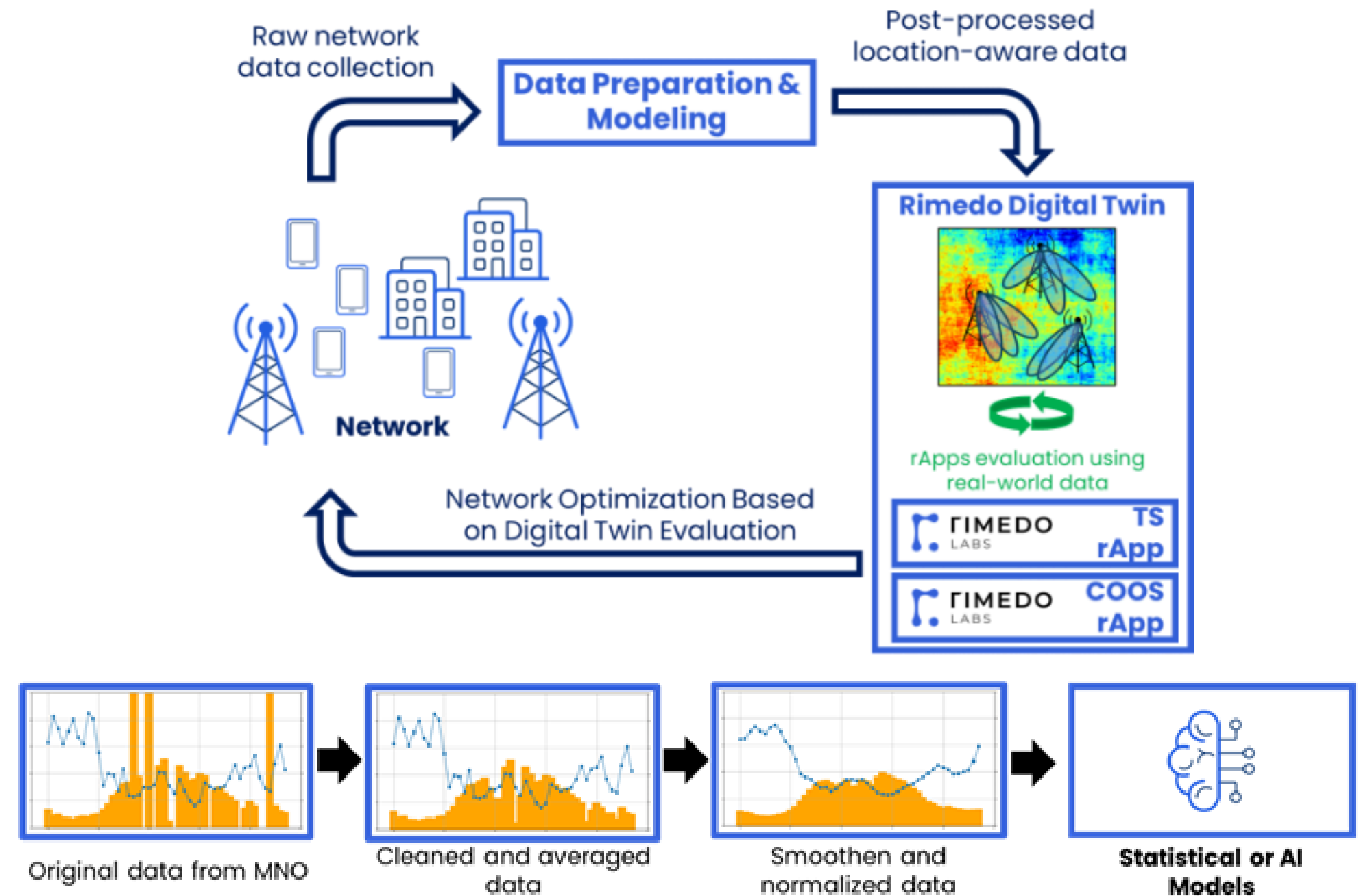
The DT-rApp functions as a comprehensive evaluation ecosystem. The core process begins with robust data ingestion: the application cleans and pre-processes raw 4G/5G RAN data, utilizing advanced statistics and AI to accurately model UE KPIs like throughput demand and cell traffic loads.

Once the baseline is established, the solution integrates real-world terrain, topography, and ray tracing capabilities to construct a highly accurate virtual propagation environment. This allows the DT-rApp to serve as a risk-free testing ground where operators can evaluate the impact of actions suggested by multiple interacting AI-empowered rApps or third-party planning tools. Operators can foresee exactly how a specific reconfiguration will affect QoS prior to live deployment.

Furthermore, the platform is integrated with specialized tools for generating extreme anomalies, such as floods or sudden base station shutdowns. This enables proactive testing of self-healing mechanisms and neighbor-cell reconfiguration strategies. Finally, leveraging these realistic models, the DT-rApp acts as a synthetic data producer, generating varied, high-quality datasets that retain the exact statistical properties of the original network - essential for training the next generation of AI/ML algorithms.

## Key benefits

- **Risk-Free AI/ML Optimization:** Test and validate RAN configurations and interactions of multiple AI-driven rApps within a secure, real-world data-based virtual replica before any changes are applied to the live network.
- **Network Resilience Evaluation:** Simulate complex anomalies (such as severe weather events or hardware sabotage) using real-world topography. Test the cost and efficiency of countermeasures and self-healing strategies to maintain QoS.
- **Synthetic Data Generation:** Produce unlimited variations of training datasets that accurately reflect live network statistical properties, accelerating the development of new AI models without compromising data privacy or availability.



## rApp characteristics

- **Supported technologies:** 4G, 5G
- **RAN technology:** O-RAN, Cloud RAN
- **RAN vendor:** multi-vendor
- **Deployment:** Non-RT RIC (SMO)
- **Algorithm:** System-level simulation (Digital Twin), Statistical Modeling, Live-network data processing
- **Application:** Network Evolution, Network Optimization, Automation & AI Foundation