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Nokia AVA

Cognitive radio frequency analytics

CSP challenges and drivers

Grow revenue: Non optimal capacity performance or spectral efficiency indicate untapped revenues and low customer experience

Optimal CAPEX ROI by maximizing the use of existing radio resources, spectrum carriers, equipment and managing investments in additional bands/HW/SW

Challenges of freeing up capacity on the 4G layers for 5G introduction, 5G traffic ramp-up and combined technologies' optimization

Achieve OPEX reduction by minimizing drive test, geolocation costs and manual analysis

2G/3G traffic switchover to 4G as 2G/3G is ramping down in many Tier 1 and 2 operator networks worldwide requires additional capacity on 4G/5G

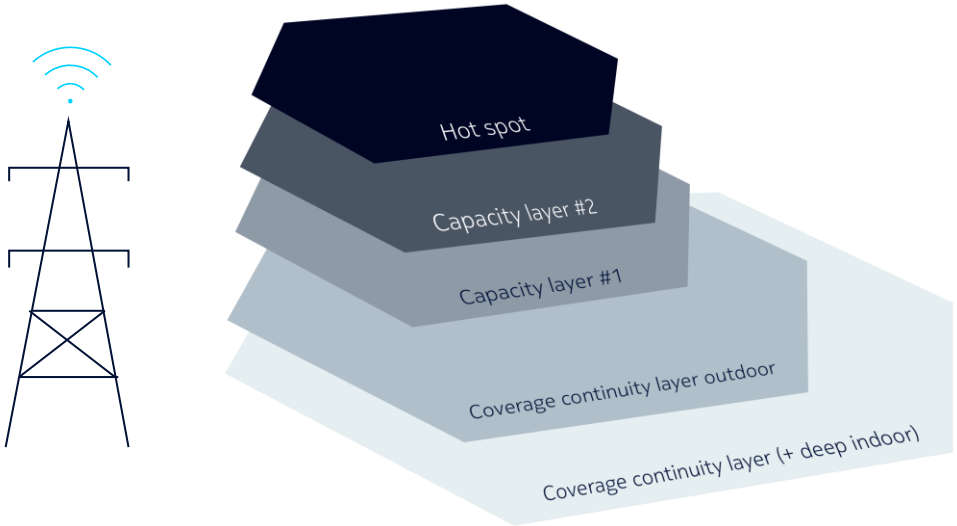
Digital transformation: Data OP and monetization using AIaaS framework, big data analytics, closed-loop capable, domain knowledge in lean, secured, least-touch and large-scale approach

Competitive benchmarking Multi-operator, multi-vendor RF and capacity (SE/throughput/…) comparison, P3 delta score analysis

Unified solution "in one box": maximizing RF performance in terms of coverage, quality, RAN capacity volume and user throughput

Coverage, capacity, and performance network analytics

Optimize CAPEX, increase performances, reducing OPEX



Coverage

Uses MDT/Geolocation/IQI/Crowdsourcing to optimise performances for the **coverage continuity layers** leveraging predictive what–if analysis in conjunction with GA automatic optimization

Capacity

Uses MDT/geolocation/crowdsourcing to optimize performances for the capacity/hot spots layers using ML-based algorithms

Analytics drive optimal utilization of network resources while lowering human intervention through assisted intelligence

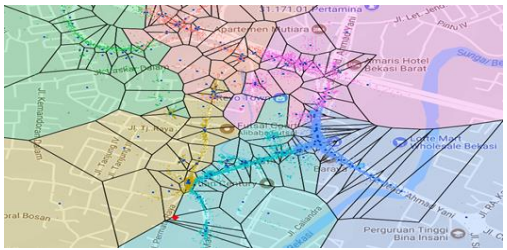
Cognitive radio frequency analytics

Maximize radio frequency performance for optimal coverage, capacity, spectral efficiency and user throughput

1

ML-based coverage and capacity geo-descriptive analytics

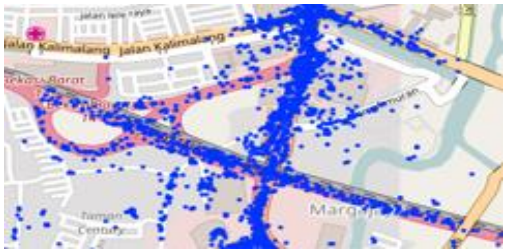
Auto-discovery of coverage-limited and capacity-limited clusters within the network. Spectral efficiency, user traffic performance, hot spot and coverage ML-driven geo-analytics with identification of inefficient spectral resource utilization, poor traffic channel quality and low throughout across 4G/5G cells and layers. Multivendor capable cloud network solution – up to 90% OPEX saving of drive test reduction, RF optimization RCA and geolocation.



2

Prescriptive to automatic recommendations with RF predictions

Combining network performance and user-experienced measurements to maximize capacity, spectral efficiency, user throughput and RF coverage quality via automatic RF shaping actions with predictive coverage simulation. Minimizing radio resource utilization providing better coverage and serving more traffic at lowest CAPEX requirements for additional capacity

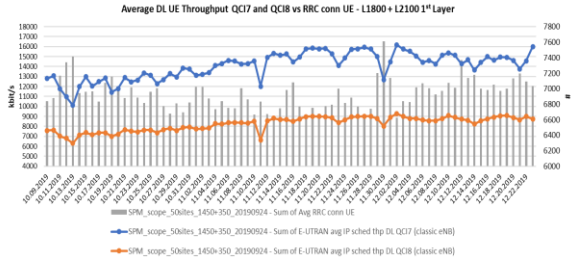


3

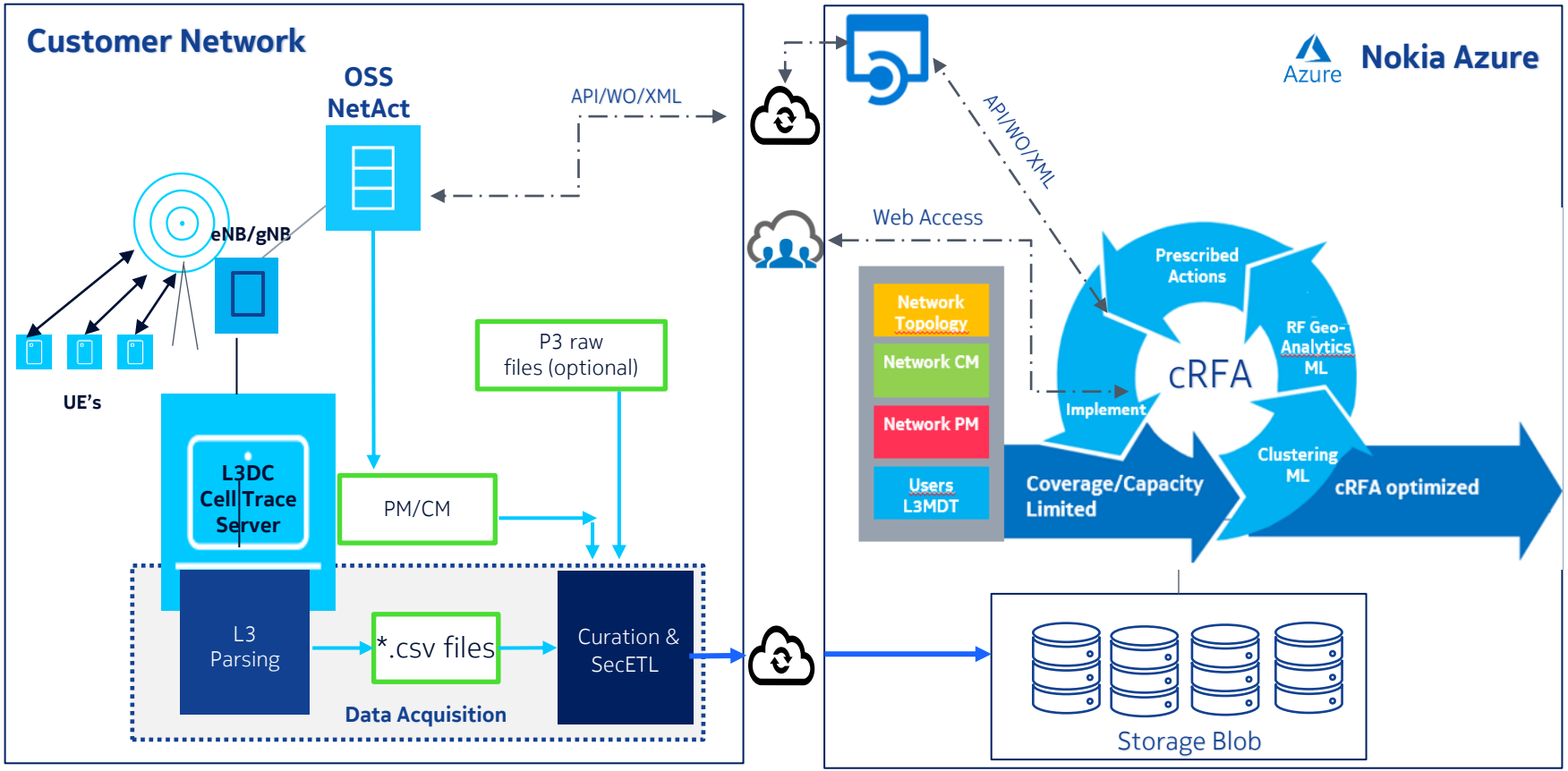
Continuous dynamic RF shaping option for max. sustained gains

- Double digit spectral performance improvement
- More than 20% throughput improvement
- PRB utilization improvements by 10%

With visualization analytics nRT dashboard, comprehensive capacity and coverage benchamrking reports and exports.



Cognitive RF Analytics based Service Architecture



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Cognitive radio frequency analytics - capabilities

Capabilities

Predictive
Simulation-based of RF coverage/quality and potential capacity gains

MDT-based
Up to <10 m accuracy

Cognitive/ML
Advanced geo-ML as a framework for RF and capacity fingerprinting

Multivendor
Support for Nokia/Ericsson/Huawei/ ZTE/Samsung/..

Closed loop ready
Generate configuration plans with recommended changes

Big data
Collect and analyze huge volumes of network cell trace MDT data

Gains in DL+UL
Analyzes and improves DL/UL capacity, quality and user throughput

Network Op.
Detect antenna anomalies, x-feeder, PCI conflicts, problematic neighbor relations,

Competitive benchmarking
Multi-operator RF comparison. P3 delta score analysis.

Automatic recommendations
Highly accurate and effective automatic RF cell recommendations for direct application on NWK

RF analysis
Coverage, quality, dominance, interference and Island analysis

4G/5G
Fast insights and gains for large-scale multi-layer 4G/5GDSS/NSA/.. networks

Continuous
Zero-touch with API to OSS


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