

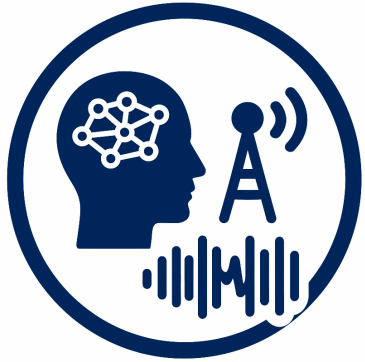


Supermicro

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Improving RAN with AI



Beamforming &
Massive MIMO

Deep learning enhances
channel estimation and
interference
management



Predictive Resource
Management

AI forecasts traffic,
optimizes spectrum use,
and reduces energy
consumption



Network Planning &
Simulation

AI-driven site planning
and digital twins
support smarter
deployments



Fault Detection &
Root-Cause Analysis

AI/ML for predictive
maintenance and
interference
classification

Improving RAN with AI



Intelligent Network Optimization

Dynamic Self-Optimizing Networks (SON) for real-time parameter tuning, coverage balancing, and anomaly detection



RAN Intelligent Controllers (RIC)

AI-driven xApps and rApps enable closed-loop automation and cross-vendor optimization



Security

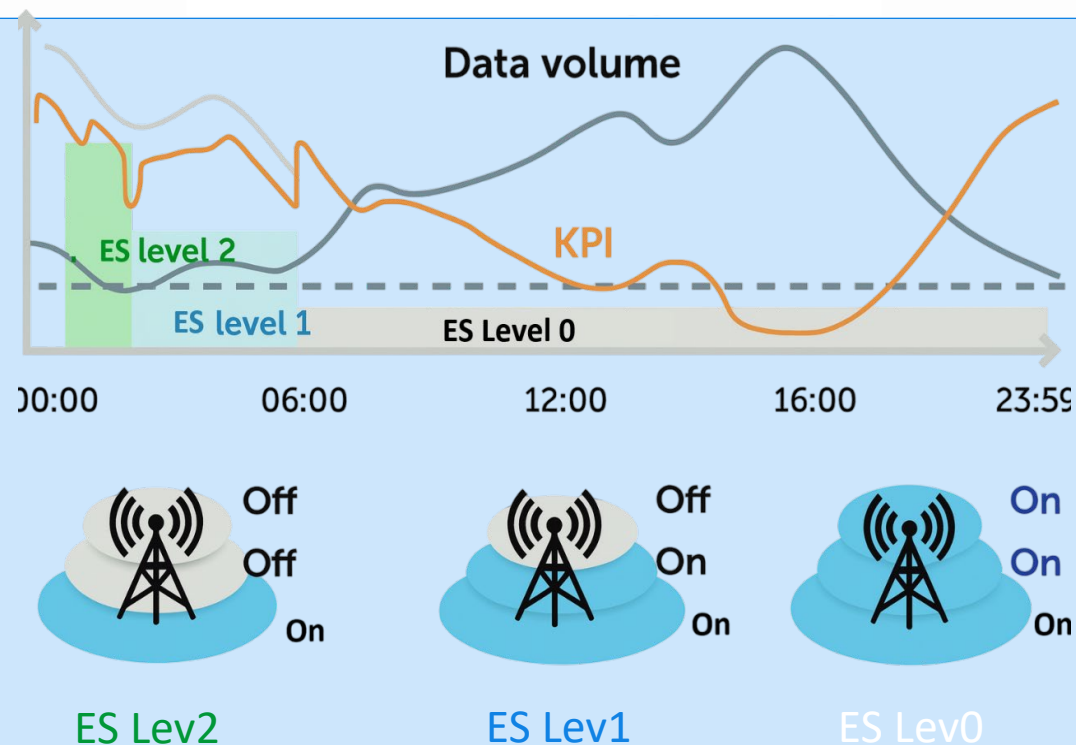
Anomaly detection and adaptive defenses strengthen network resilience



User Experience Optimization

Predicts QoE, improves mobility and resource scheduling

Predictive Resource Management Use Case



Solution:

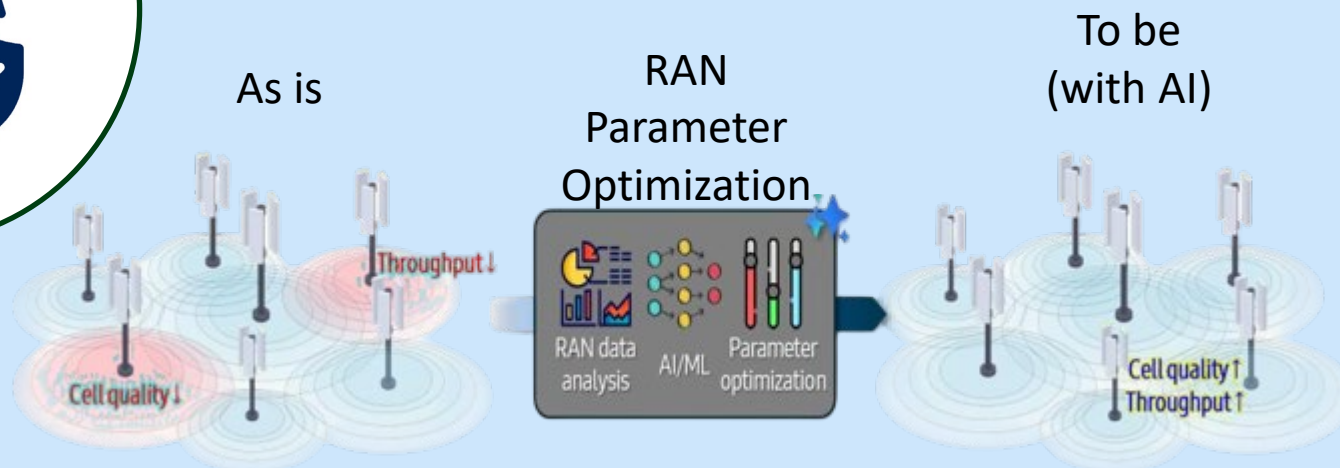
Scalable AI hardware and software at the RAN empower telcos to interpret real-time usage trends against KPIs, improving radio resource management across markets of varying density



Outcome:

AI-powered dynamic radio management helps operators reduce energy use by turning off radios during low-demand hours—without compromising network quality

Intelligent Network Optimization



Solution:

Boost real-time performance using AI-powered RAN hardware that continuously optimizes data collection and processing across central and edge nodes to meet key performance and energy goals.



Outcome:

Optimized hardware and software deployment boosts network performance through intelligent parameter tuning—reducing both manpower and operational costs

Conclusion



Stage	Description	AI Role	HW Optimization		Expected Outcome
Today (5G)	Semi-automated SON and traffic optimization	Vendor Specific Supervised ML	Traditional NEP		Energy reduction, basic automation
Near-Term (5G-Advanced)	Closed-loop optimization via RIC & SMO	Reinforcement Learning, Edge AI		Traditional NEP with Accelerated Compute & AI RAN Deployments	Self-optimizing RAN, predictive energy control
Future (6G)	Fully autonomous, self-learning RAN	Federated & self-evolving AI		Native AI RAN that scales/"right-fit" based on market KPIs	"Zero-touch" operations, 40–60% lower OPEX, carbon neutrality alignment

Benefits

OPEX savings: 15–30% reduction in network energy

Carbon footprint reduction: Up to 25% lower CO₂ emissions per site

Operational efficiency: Fewer manual interventions and faster network adaptation

QoE improvements: Smarter trade-offs between energy efficiency and user experience



Thank you!