

Automation and artificial intelligence are becoming business-critical

The complexity of cellular networks is continuously increasing. Mobile operators evolve their networks to introduce advanced capabilities and differentiated services for industries, enterprises and consumers.

This evolution requires higher sophistication, which comes with a growing number of functionalities, algorithms and parameters.

In addition, many operators deploy technologies from different suppliers, which increases the complexity and cost pressure.

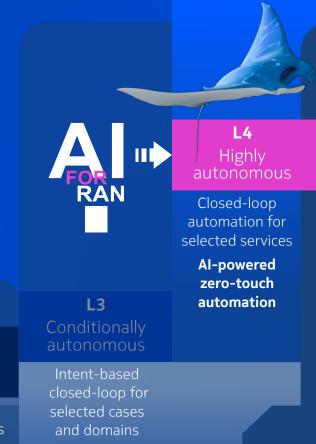
To effectively address these challenges, automation and artificial intelligence will be business-critical.

This solution brief describes Nokia MantaRay SMO, our Service Management and Orchestration solution whose Al capabilities are field-proven in customer networks. It's the industry's first solution that reaches level 4 of TM Forum's autonomous network framework today.



Advanced automation needs extensive Al

MantaRay SMO reaches TM Forum's level 4, which means intent-based autonomous network operations. Without extensive use of AI, it's simply not possible to reach L4.



L5Fully autonomous

Closed-loop automation across multiple services, domains & E2E lifecycle

LO Manual **L1** Assisted

Pre-configured execution

L2Partially autonomous

Closed-loop for few discrete cases

Service Management and Orchestration framework brings agility and efficiency

The O-RAN Alliance has defined the Service Management and Orchestration (SMO) framework as an open platform to manage a multisupplier, multi-technology radio access network (RAN).

SMO provides the intelligence, automation and coordination for managing the end-to-end lifecycle of the network. It enables intelligent service agility and enhanced operational efficiency.

The SMO framework consists of different layers:

- Multi-supplier network management
- Application automation comprising radio applications (rApps), and their intelligent control
- Orchestration

Nokia MantaRay SMO is built on this open architecture and supports RAN automation and optimization capabilities in a standardized way.



Field-proven MantaRay product family has evolved into Nokia MantaRay SMO



MantaRay SMO brings tangible benefits

Enhanced performance



- Optimizes the network for different KPIs simultaneously with AI algorithms
- Leverages intelligent closed-loop automation

Truly open architecture



- Supports O-RAN interfaces and an open ecosystem
- Enables an extensive catalogue of rApps (both Nokia and third-party)

Sustainable TCO



- Manages multi-supplier, multi-technology complexity
- Significantly reduces operational costs

Slice automation



- Automates the dynamic orchestration of network slices
- Ensures that each slice meets specific SLAs



Building future-proof capabilities on today's solid portfolio

We are paving a clear evolution path to the future, building on field-proven solutions that are available and used by many of our customers already today.

Already today, our portfolio

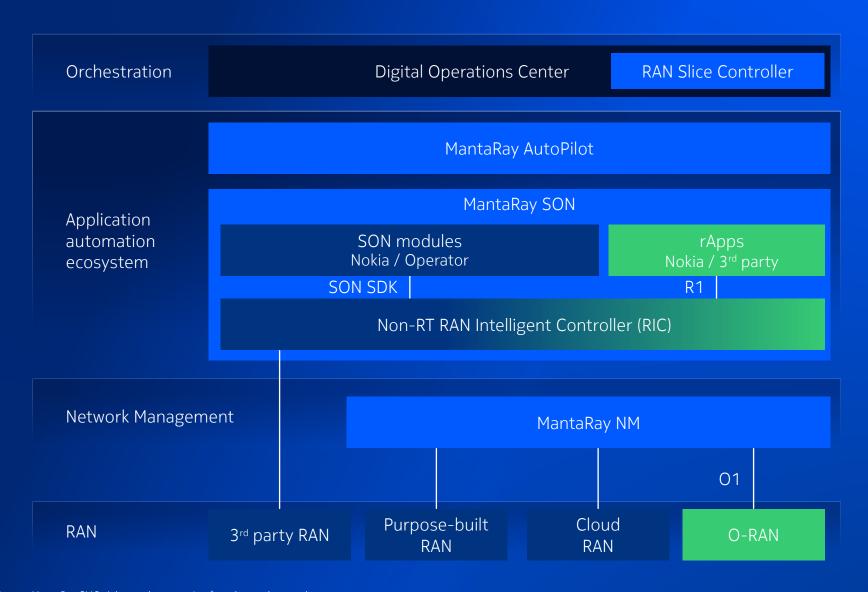
- Enables Al-driven optimization and automation
- Supports multi-supplier environments
- Manages purpose-built and Cloud RAN

With MantaRay SMO, we introduce the next-level of openness and automation:

- MantaRay SON evolves to non-real-time RAN Intelligent Controller (RIC)
- Our SMO supports O-RAN R1 interface, which enables an extensive catalogue of rApps (both Nokia and third-party applications)
- It manages O-RAN in addition to purpose-built RAN and Cloud RAN

We offer a simple evolution, not an unnecessary revolution.

Simple evolution to open architecture with investment protection



Comprehensive solution enabling advanced Al and zero-touch automation

MantaRay SON

MantaRay SON is a market-leading self-organizing networks solution. It's been field-proven in more than 120 large-scale multi-supplier networks worldwide.

It will evolve into a non-real-time RIC platform with O-RAN compliant interfaces and rApps.

Our open application marketplace will also include an extensive catalog of third-party rApps.

MantaRay AutoPilot

MantaRay AutoPilot is an intent-based, Al-powered solution that autonomously orchestrates the SON modules, enabling intent-based autonomous network operations.

Its extensive AI and automation capabilities are unique in the industry, already leveraged for optimizing and automating major customer networks today.

Read more about MantaRay AutoPilot



MantaRay NM

MantaRay NM is a centralized radio network management solution for purpose-built RAN and Cloud RAN, including data center hardware and cloud infrastructure. We are further enhancing it with O-RAN-compliant interfaces.

More than 500 customers are already running MantaRay NM in their networks.

Digital Operations Center

Digital Operations Center integrates a key functionality for the SMO, the RAN Slice Controller. It provides dynamic orchestration and resource management capabilities, so that each network slice meets specific service level agreements. It's field-proven in customer networks globally.

Fostering collaboration and innovation with a unique application ecosystem

We have long been offering a software development kit (SDK) to MantaRay SON customers and application developers. To date, our customers have developed and deployed more than 250 SON modules to enhance their network capabilities.

With the evolution to SMO, we will initially offer more than 30 rApps based on our exciting field-proven MantaRay SON modules.

Our open application marketplace will also include an extensive catalog of third-party rApps.

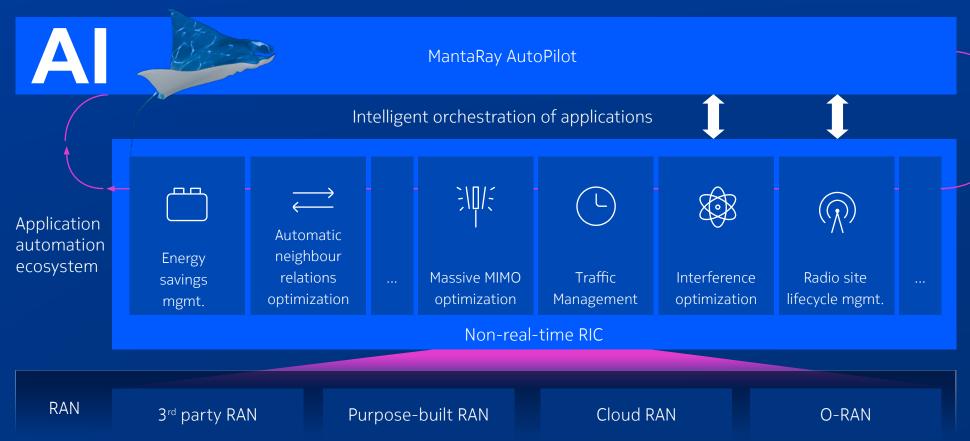
The rApp marketplace accelerates innovation and helps operators and developers create new revenue streams.

Operators can browse, select and deploy rApps tailored to their specific needs, ranging from network optimization and automation to advanced analytics and Al-driven service assurance.

MantaRay SMO can orchestrate existing SON modules, Nokia rApps and third-party rApps

Intelligent orchestration of SON modules and rApps

The great advantage of MantaRay AutoPilot is that it can orchestrate existing SON modules that our customers use today and new rApps developed by Nokia, our customers and application developers. Here are some examples of the various applications that operators can leverage for optimizing network configuration, energy efficiency, performance, quality of service and much more.



Extensive Al and automation capabilities field-proven in customer networks

A large Tier 1 operator

stc Saudi Arabia



The large Tier 1 operator has one of the biggest multi-supplier SON deployments in the world.

The advanced AI and automation capabilities of MantaRay AutoPilot enabled fully autonomous optimization routines based on the performance targets the operator has defined for its network.

Key results include:

- 30% enhancement in network KPIs
- Up to 22 times faster module execution with 9 times more optimization opportunities detected
- 100% accuracy in detecting network incidents

In 2025, MantaRay Autopilot performed 15,000 autonomous operations per hour with massive ongoing network traffic in stc's commercial network. This degree of dynamic network optimization is simply not possible without Al.

Key results include:

- 15,000 autonomous corrective actions per hour
- 60% reduction in cell outages
- 10% enhancement in peak throughput

Already in 2024, MantaRay AutoPilot delivered substantial operational enhancements for stc during Hajj while network traffic grew by 40%. At that time, we implemented a unique 15-minute learning interval for the AI algorithms.

Read the case study from 2024



Why Nokia?

Simple evolution with investment protection

MantaRay SMO is the next evolution step of our fieldproven MantaRay product family, which provides investment protection to our current customers.

Industry-leading AI and automation

Our market-leading MantaRay product family with embedded AI and automation capabilities has been running in large-scale, multi-supplier customer networks since 2019.

Reaching TM Forum level 4 today

We are the only supplier reaching level 4 of TM Forum's autonomous network framework today, which is made possible by MantaRay SMO's advanced AI capabilities.

Open solution for multi-supplier networks

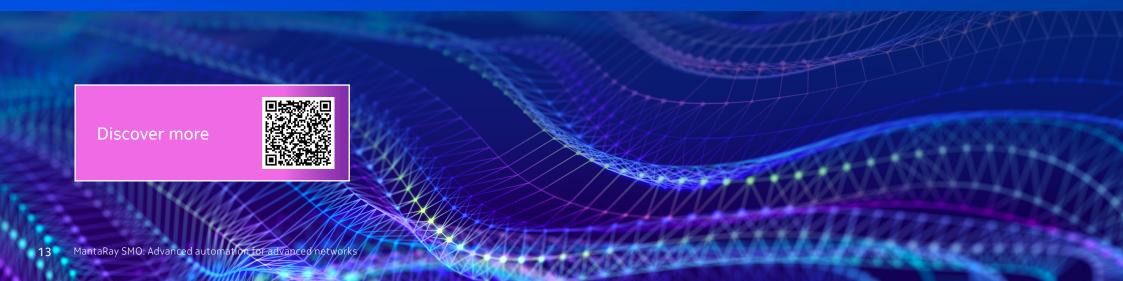
Our truly open SMO solution already supports multisupplier networks today. It also supports O-RAN interfaces.

Unique application ecosystem

MantaRay SMO comes with more than 30 rApps based on our existing SON modules. We are building an open ecosystem with an extensive catalogue of rApps, and we offer a software development kit (SDK) to our customers and application developers.

Focus on business outcomes

Our extensive Al and automation capabilities are proven in commercial networks, delivering tangible benefits to our customers. In addition, we deliver enhanced efficiency with our Al-based services.



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At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.

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