

Solution brief

MantaRay AutoPilot:

Powering AI-driven Autonomous RAN Operations

NOKIA



Start the journey towards autonomous RAN operations

The business environment in the telecommunications industry is transforming. Like various other industry sectors, it relies increasingly on autonomous operations.

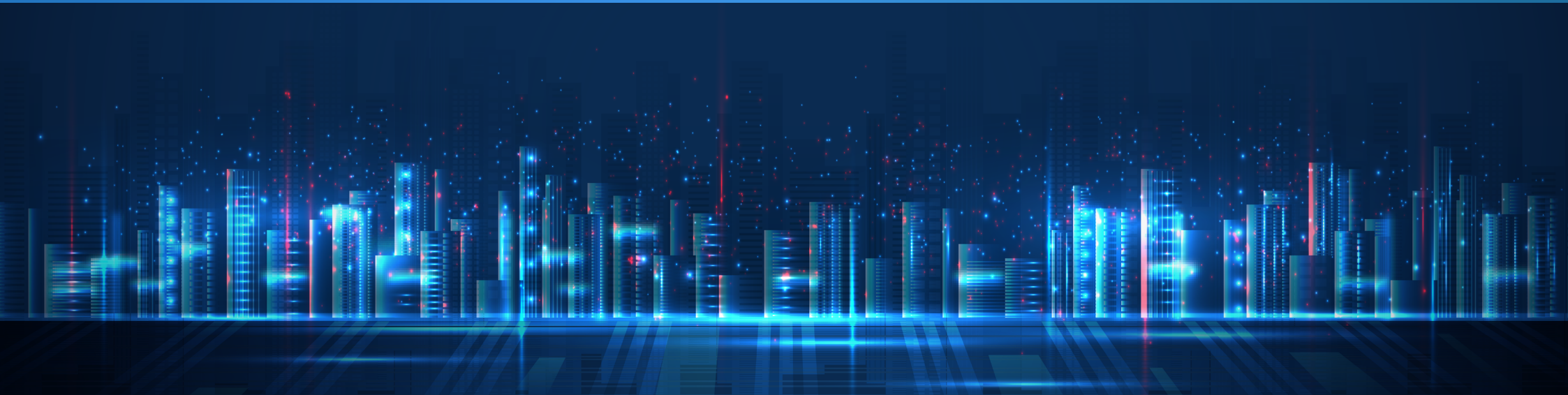
In this environment marked by exponentially growing complexity, mobile network operators need an autonomous network operations solution that works behind the scenes without interruptions and is truly integral to the network.

New innovations and embracing artificial intelligence capabilities are essential for achieving a higher level of automation in the network.

Artificial intelligence will allow you to:

- Simplify operations
- Maximize performance
- Optimize energy efficiency
- Minimize operational costs

The AI-based MantaRay AutoPilot is the simplest way to start the autonomous network RAN journey.



Artificial intelligence is a game changer for RAN operations

With the wider adoption of 5G, we will see tailored services for different market segments, such as industries, enterprises and consumers.

At the same time, the coexistence of previous generations of radio technologies, from 2G and 3G to 4G, makes mobile networks more complex than ever before.

Operators will add more frequency bands, dedicated network slices and sophisticated software capabilities that all need to be optimized and managed. That amounts to thousands of base stations and millions of cells - too much for humans alone to manage.

With earlier generations of mobile technologies, SON solutions have been deployed to complement and partially replace manual operations. With 5G and beyond, AI-based SON solutions are going to be downright essential.

AI can handle routine operations significantly faster and produce better quality than previous tools.



The solution is simple – let MantaRay AutoPilot manage it all.

Autonomous networks supporting digital transformation

We have aligned the AI capabilities of MantaRay AutoPilot based on the TM Forum's autonomous network framework.

TM Forum is an alliance of 800+ global companies including 10 of the top mobile network operators in the world. It focuses on developing industry standards and best practices to drive innovation and improve efficiencies in the digital service industries.

Autonomous operations model

TM Forum's autonomous network framework defines six levels of automation, with level 0 being fully manual and level 5 fully autonomous.

Each level describes to which extent a solution applies autonomous capabilities in network operations. The participation of humans and machines is an important factor in evaluating the network autonomy level.

Thanks to built-in artificial intelligence, our MantaRay AutoPilot can reach level 4 already today, which means high autonomous operations.

Without AI, it is not possible to reach TM Forum's levels 4 and 5.

MantaRay AutoPilot brings the next level of automation

MantaRay AutoPilot represents a giant step in the use of AI-based network automation, supporting mobile network operators' digital transformation strategy towards autonomous operations.

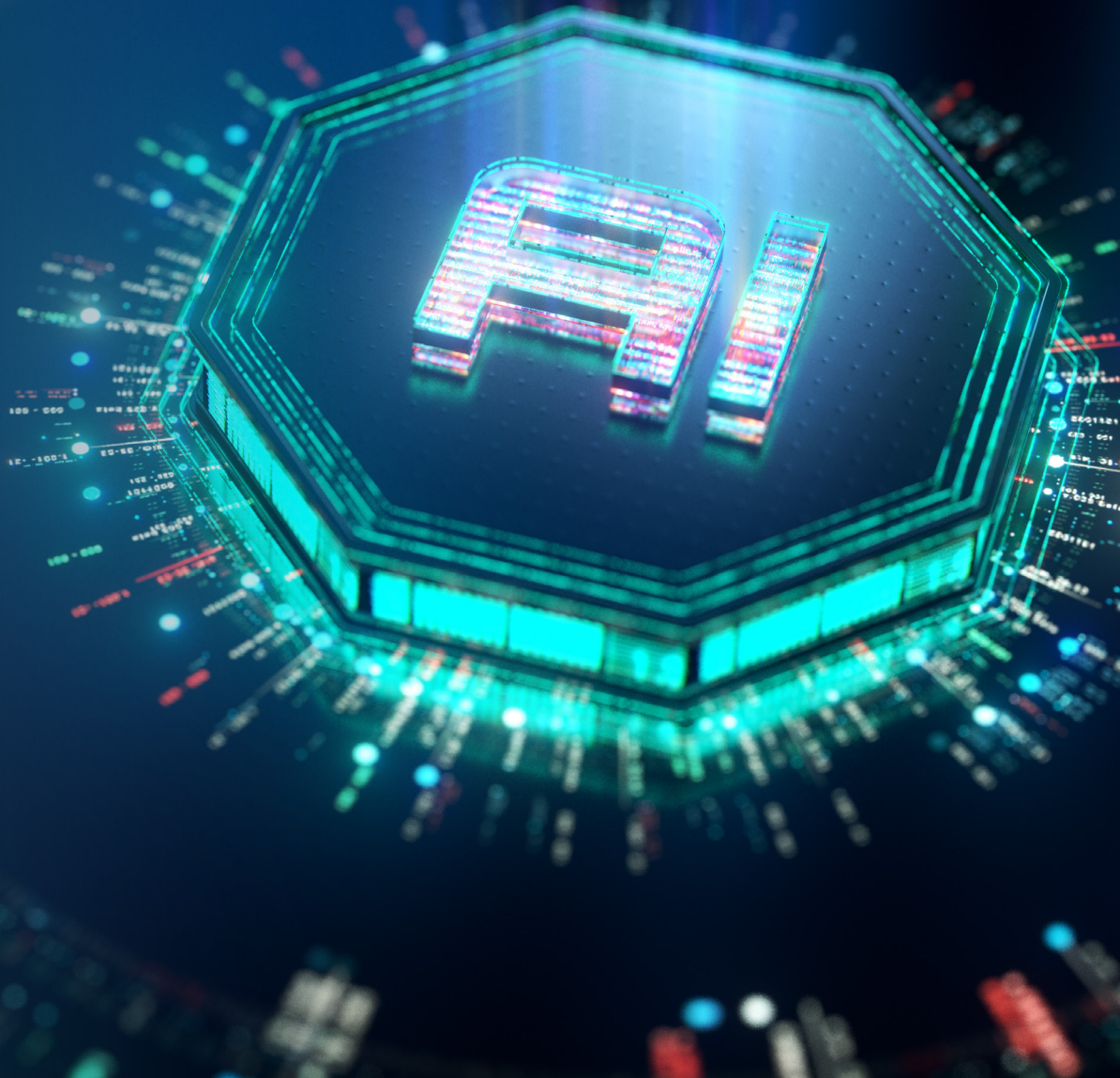
MantaRay AutoPilot uses established AI algorithms such as K-means clustering for contextualization and enhanced algorithms for supervised learning and reinforcement learning.

From the human resource perspective, the profile of people working with SON is also transforming.

With traditional SON, experienced operations engineers with specific skills took the lead in defining how to best fine-tune performance using SON modules.

With AI-based automation, optimizations can be managed with fewer people, and the highest level of RAN optimization expertise is no longer necessary. This enables operations engineers to concentrate on the most demanding tasks that require human intelligence.

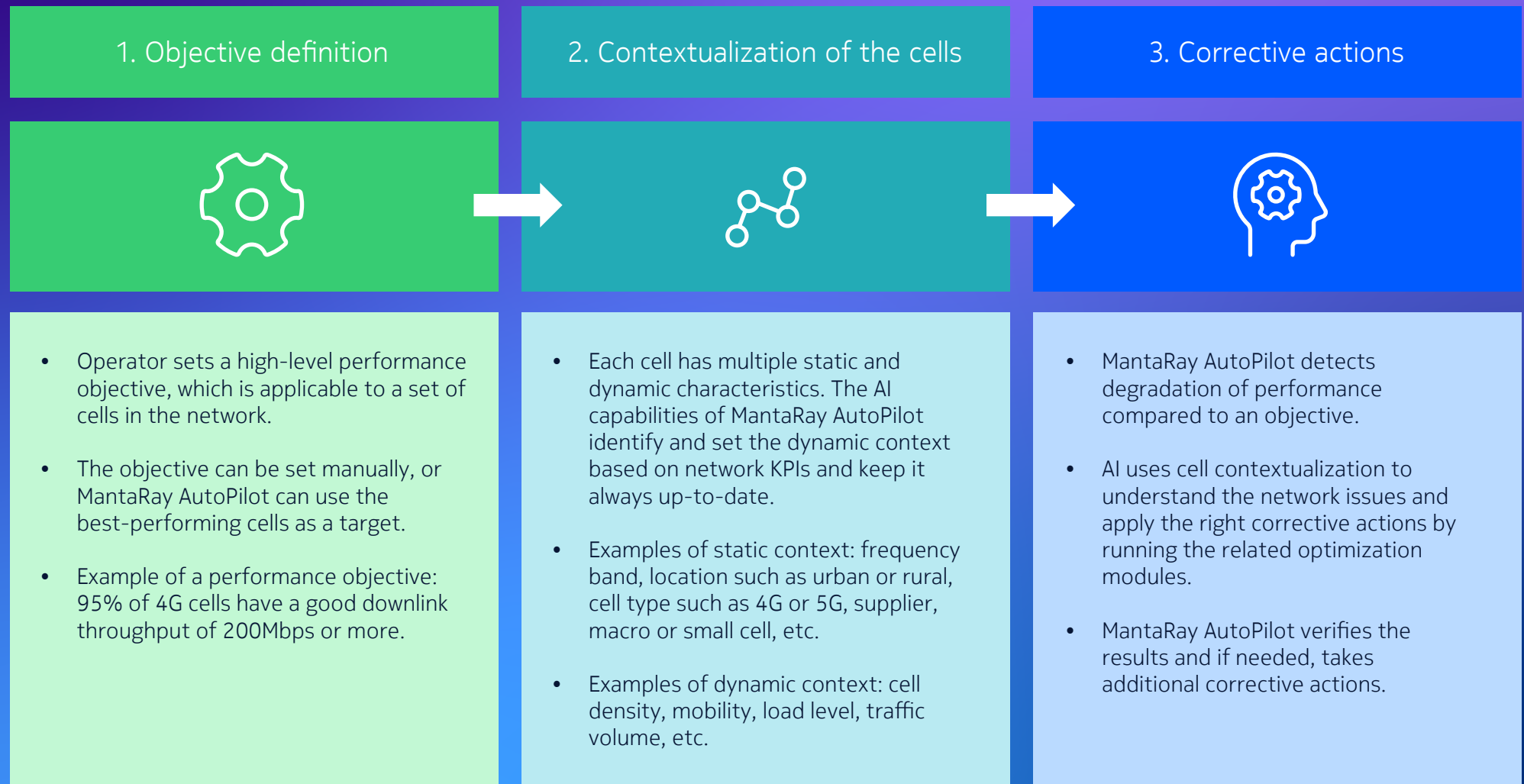
AI-based automation also reduces the possibility of human error which helps enhance network quality.



Networks that can think
and act for themselves
power the next step in
digital transformation



MantaRay AutoPilot makes autonomous network optimization possible



AI-powered radio network optimization field-proven in live networks

Results from live customer trials

MantaRay AutoPilot has the potential to cut operating costs by reducing or even eliminating the need for human intervention.

A large Tier 1 operator was able to contextualize 70,000 cells in under 10 minutes with MantaRay AutoPilot. This was 99 percent faster than contextualizing the cells manually, which would have taken several days to accomplish.

MantaRay AutoPilot can significantly reduce the time needed to detect and repair network issues.

A large Tier 1 operator was able to detect and repair network problems almost 90 percent faster than with traditional SON.

Business impact

Fully automated network optimization brings tangible results:

- Enhanced network quality results in better, more consistent customer experience
- Improved operational efficiency helps reduce OPEX
- Optimized RAN performance brings CAPEX savings

As a result, AI-based MantaRay AutoPilot makes a clear impact on an operator's business.

99%
faster cell
contextualization

90%
faster problem
detection and
repair

Nokia makes AI-driven autonomous RAN operations a reality

The digital transformation of societies is a reality today. The transformation of the telecommunications industry relies increasingly on automation.

Operators have different strategies and base their decision on deploying new technologies and features on different requirements. One thing is certain: the increasing adoption of artificial intelligence is part of every operator's agenda.

Nokia is leading the AI-based transformation by taking network automation to the next level with MantaRay AutoPilot.



It takes days manually, it takes hours with traditional SON but **just minutes** with Nokia MantaRay AutoPilot



Nokia OYJ
Karakaari 7
02610 Espoo
Finland

Tel. +358 (0) 10 44 88 000

CID: 213071

nokia.com

NOKIA

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.

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.

© 2025 Nokia