

Why Network Data Analytics Function (NWDAF)?

Network Data Analytics Function or NWDAF is a standardized 3GPP network function deployed within the packet core. It is fully containerized and integrated with the Network Repository Function (NRF), which streamlines the way network data is produced and consumed, generates insights, and triggers closed-loop actions to enhance the customer experience.

NWDAF is intended to drive closed-loop automation and zero-touch network management. It enables native data analysis, which is highly efficient and critical for ensuring service quality and improving network performance while generating new revenue streams for 5G.

RADCOM's NWDAF Solution

RADCOM NWDAF is designed to help accelerate efficient operations and transition to autonomous networks and closed-loop automation. Its smart, centralized analytics system provides a distinctive value proposition, lowering the total cost of operations, creating new revenue opportunities, and improving customer experiences. RADCOM's integrated artificial intelligence and machine learning capabilities are at the heart of the solution and facilitate predictive analytics to enhance real-time network operations and deliver unparalleled customer experiences.

Use Cases

RADCOM NWDAF is standards compliant and provides all the 3GPP use cases defined in Rel. 15, 16, 17, and 18 as well as offering customer-driven use cases. Some examples include the following:

Automated Troubleshooting and Remediation

SLA/QoS support	Maps the initial SLAs to the 5GS QoS parameters to guarantee service performance
Private network slicing SLA assurance	Ensures SLA compliance in private networks/slices, compares KPIs and triggers corrective actions, predicts future values and triggers preventative actions in case of breach of SLAs
Signaling storm mitigation	Ensures SL compliance in private networks/slices, compares KPIs and triggers corrective actions, predicts future values and triggers preventative actions in case of breach of SLAs
Abnormal UE behavior	Performs data analytics on abnormal behavior, returns exception reports from correlations between behavioral variables e.g. exception ID, level and other info to reduce required resources for user plane processing
Data congestion mitigation	Detects and mitigates "signaling storms" launched by malware or apps, which overload the bandwidth at the core or cell level

IoT anomaly detection	Detects and mitigates IoT device network and security issues, learns each device's communication patterns to highlight malicious activity or other problems
Unauthorized tethering and network hogs	Detects UEs that perform unauthorized or abusive tethering, triggers required actions e.g. sends warning SMS, limits quota of EU and detects bandwidth hogs and blocks data services
Impact mitigation for outage condition	Detects condition that network is impacted by special conditions and mitigate the issue by changing core configuration
Impact analysis with RAN integration	Detects condition that network is impacted by special conditions (e.g. very large number of UEs attaching to the network in short intervals) and mitigate the issue by changing RAN configuration
Predicted coverage QoE impact	Detects UE application usage and location, predicts future EU location and alerts if UE is predicted to enter coverage hole, take corrective action before impacts user
IoT security	Ensuring IoT devices do not introduce threats into the network
Modification of drone mobility area	Detection, notification and correction of unexpected UE location through NWDAF output
Paging failure prediction	Predicts the paging failure possibility in certain time frames and areas of the UE, and notifies if paging failure above certain limit
Cell congestion due to heavy users	Automatically detects and alerts on cells with congestion, provides list of heavy users and PCF applies policy to those users
Sleepy cell detection	Quickly detects sleepy cells that don't trigger alarms and resolves issues using close-loop interfaces

Network Optimization

Paging optimization	Reduces paging messaging by 50%, reduces MT call setup delay
Automated disaster recovery	Ensure stable and lasting service during disaster events, detects anomalous network behavior, guides resource allocation, activates secondary sites in case of complete main site outage

Mass call event optimization	Detects an occurrence of mass call event, evaluates NF load and stability states, takes actions to balance load and secure network stability
RAN and data correlation for RIC	Provides subscriber-aware and service-aware KPIs to the RAN Intelligent Controller (RIC) to optimize and prioritize RAN resources
Improves the autonomy of mIoT terminal	Proper configuration of mobile initiated connection only (MICO) related parameters are required. NWDAF collects and analyzes information to AMF
NWDAF assisted background data transfer	Predicts best time to transfer background data (e.g. software updates to users), depending on location of users and congestion levels to reduce load congestion
Selects edge application server for optimal QoE	Assists in discovering application server instance in edge networks, selects default application server closest to location of UE to ensure low latency connection or provides solution for higher latency
Power consumption reduction	Saves energy dynamically by reducing RAN energy usage while ensuring QoS and reducing OPEX
Background data transfer (BDT) optimization	Predicts best time for data transfers to millions of UEs, according to locations and congestion levels
UE prioritization within cell	Provides real-time information from core to RAN intelligent controller (RIC) to make data-informed decisions of resource prioritization between UEs within a cell

Analytics Monetization

Analytics as a service	<ul style="list-style-type: none"> ■ Advertisers ■ Municipal planning
Proactive retention	Detects customers likely to churn, and automatically triggers proactive retention action
Contextual offers	Triggers upsell offers and actions based on real-time, learned customer actions
Monitors of vehicle fleets	Generate notifications of out-of-normal UE behavior or misuse from any device connected to the 5G network incl. communication patterns in unauthorized hours, network configuration

Autonomous vehicle support

Network performance incl. speed and direction or location of vehicle, and network performance related information (time-based charging, spatial) and QoS Sustainability for V2X

Benefits

- **Cloud-native** - Enables closed-loop automation across public and private clouds
- **Scalable** - Thousands of network slices and private networks can be monitored for KPIs such as performance, QoE
- **3GPP standard compliant** - From Rel. 15 to Rel. 18 and beyond
- **Open APIs** - Offers open APIs for non-standard integration
- **Open BYOC Support** - Bring your own container support for plug-in of third-party model training into the NWDAF solution
- **Multiple DAF functionality** - Runs NWDAF, M-DAF, and RAN-DAF from one single platform
- **Private Network-as-a-Service** - Services to private networks or on the cloud

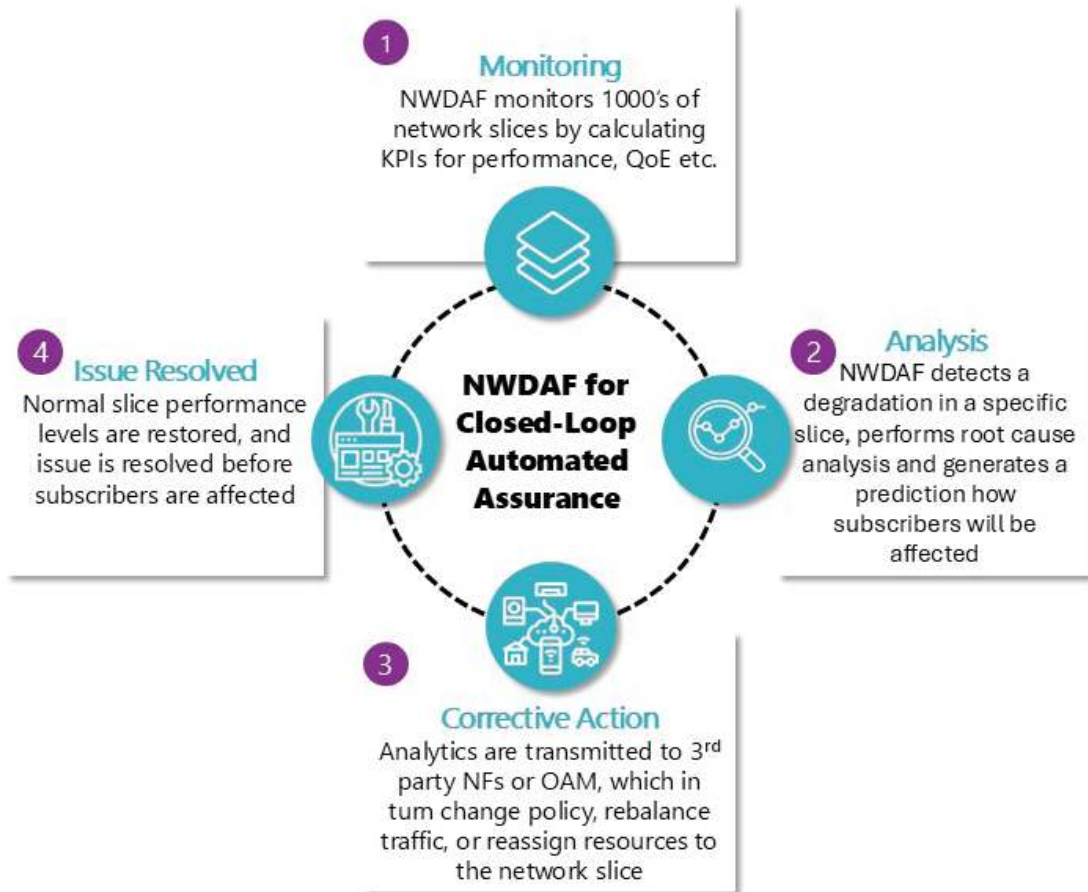


Figure 1- Closed loop automation using RADCOM NWDAF

RADCOM (Nasdaq: RDCM) delivers real-time network analysis, troubleshooting, and AI-driven insights to ensure a superior customer experience. Utilizing cutting-edge technologies for over 30 years, we provide dynamic service assurance through the following solutions, including: RADCOM Customer Experience, RADCOM Network Performance, RADCOM Operational Efficiencies, RADCOM Network Troubleshooting, RADCOM Revenue Generation, RADCOM Service Quality and RADCOM Network Tapping.

For more information visit: <https://radcom.com/>