

DATASHEET



NETWORK DATA ANALYTICS FUNCTION (NWDAF)

Built for 5G Data Insights

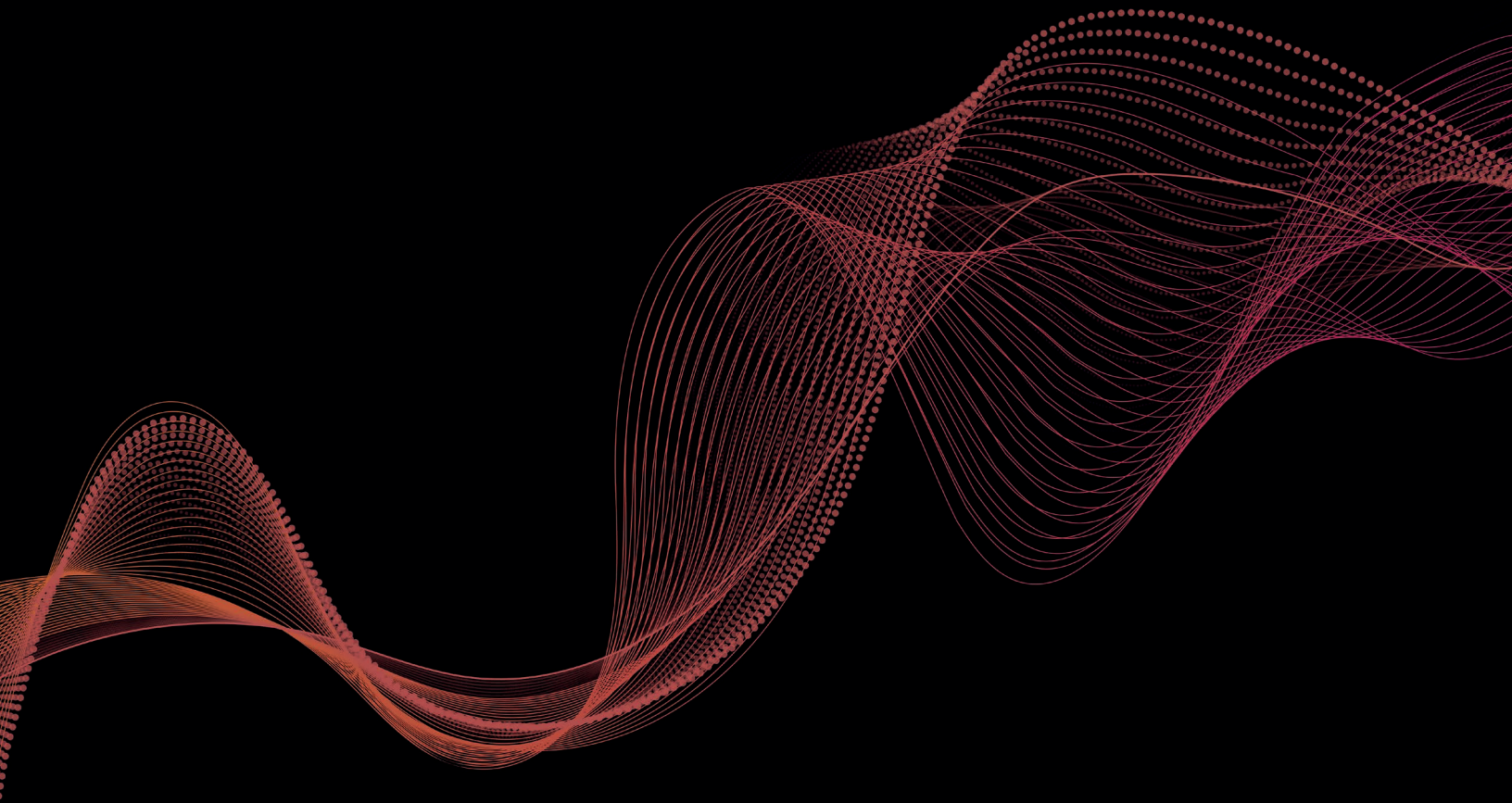


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Introduction

In Q4 2020, Analysys Mason stated that there is “a clear need for the NWDAF in order to standardise operational data for all applications and functions” and that “5G networks are already complex, and this complexity will increase as core network components that enable network slicing are added. A high degree of automation is therefore required to avoid increasing operational costs. AI and analytics solutions are now seen as critical for the creation of new automations; this was first recognised in the 3GPP standards in 2017 when the network data analytics function (NWDAF) standard was initially defined.”

Product Description

NWDAF is a 5G Core Network Function (NF) that collects data from other Network Functions (NFs) of the 5G Core – specifically the Network Repository Function (NRF), Access and Mobility Function (AMF), Session Management Function (SMF), Unified Data Management (UDM), Policy Control Function (PCF), Application Function (AF) and Network Exposure Function (NEF) and from the Operation, Administration and Management (OAM) system.

Product Description

NWDAF monitors all aspects of each network slice for compliance with relevant service-level agreements. Service providers can make use of NWDAF in their infrastructures to help proactively manage the level of service and deliver stronger customer experiences.

NWDAF is network-aware and can interface with various control or data plan network functions to collect events that could be of interest for analysis. Subscription handling enables the consumer NF to subscribe and unsubscribe to specific network data analytics. The subscription may specify a periodic notification or a notification upon threshold being exceeded.

Types of Use Cases

The use cases supported by NWDAF can be categorised by: Reactive (or Responsive) Analytics; Proactive Network Analytics; and Proactive Subscriber Analytics. NWDAF supports a broad spectrum of analytics capabilities ranging from threshold-driven analytics to more sophisticated algorithm-based analytics, such as machine learning, regression algorithms, deep learning or predictive modelling.

Types of Use Cases

Machine learning models over NWDAF include:

- **Anomaly Detection**

Automatic alerts for changing data that behaves unexpectedly by providing a prediction of the expected range for an upcoming data point and creating an alert when the occurring data point is outside the predicted range for 'normal' data behaviour

- **Real-Time Issue Prediction**

Enabling NWDAF to support Policy, orchestration and other NF consumers of analytics to react automatically and in real-time within the 5G network. This allows NFs to optimise the network and prevent issues, such as service degradation, or quality of service issues by predicting that a metric will cross a certain threshold defined for that metric and within a defined time range

- **Network Optimisation**

Providing metric predictions for additional time ranges that can help with optimisation needed for future planning

Amdocs NWDAF Product Features & Design Principles

The network functions that comprise the 5G product suite are built on a shared technology foundation based on the following common principles:

Feature	Description	Feature	Description
Containerised, Micro Services, Published APIs	Efficiency gains in the consumption of resources and the time to deliver incremental product enhancements	Low Code	Convention over configuration over customisation product enhancements
Material Design UI	Providing a rich and intuitive UX	Common Data Sets	Common/shared reference data sets
Open Source	Extensive use of open source tooling product enhancements	Testability	Testable configuration to deliver incremental product enhancements
API First	Script and automate configurations	Traceability	Follow the lifecycle of data to track all access and changes
Equivalent CLI & UI Across NFs	Functionally equivalent CLI and UI across NFs product enhancements	Flexible Deployment Options	An array of deployment options available to deliver incremental
Blueprints	Out-of-the-box, fully performative set of functionality		

NWDAF as a part of the 5G Value Plane

5G Value Plane combines a suite of pre-integrated 5G network functions, including PCF (Policy Control Function), CHF (Charging Function), NEF (Network Exposure Function) and NWDAF as part of a fully 3GPP compliant solution built on a Service Based Architecture. NWDAF provides the ability to fully exploit the 5G Value Plane component suite by enabling resource and service optimisation, as well as new service behavioural and transactional insight.

NWDAF introduces a higher level of intelligence to the 5G network. With combined data abstraction and machine learning, the inference-based KPIs per use case provide critical input to enable:

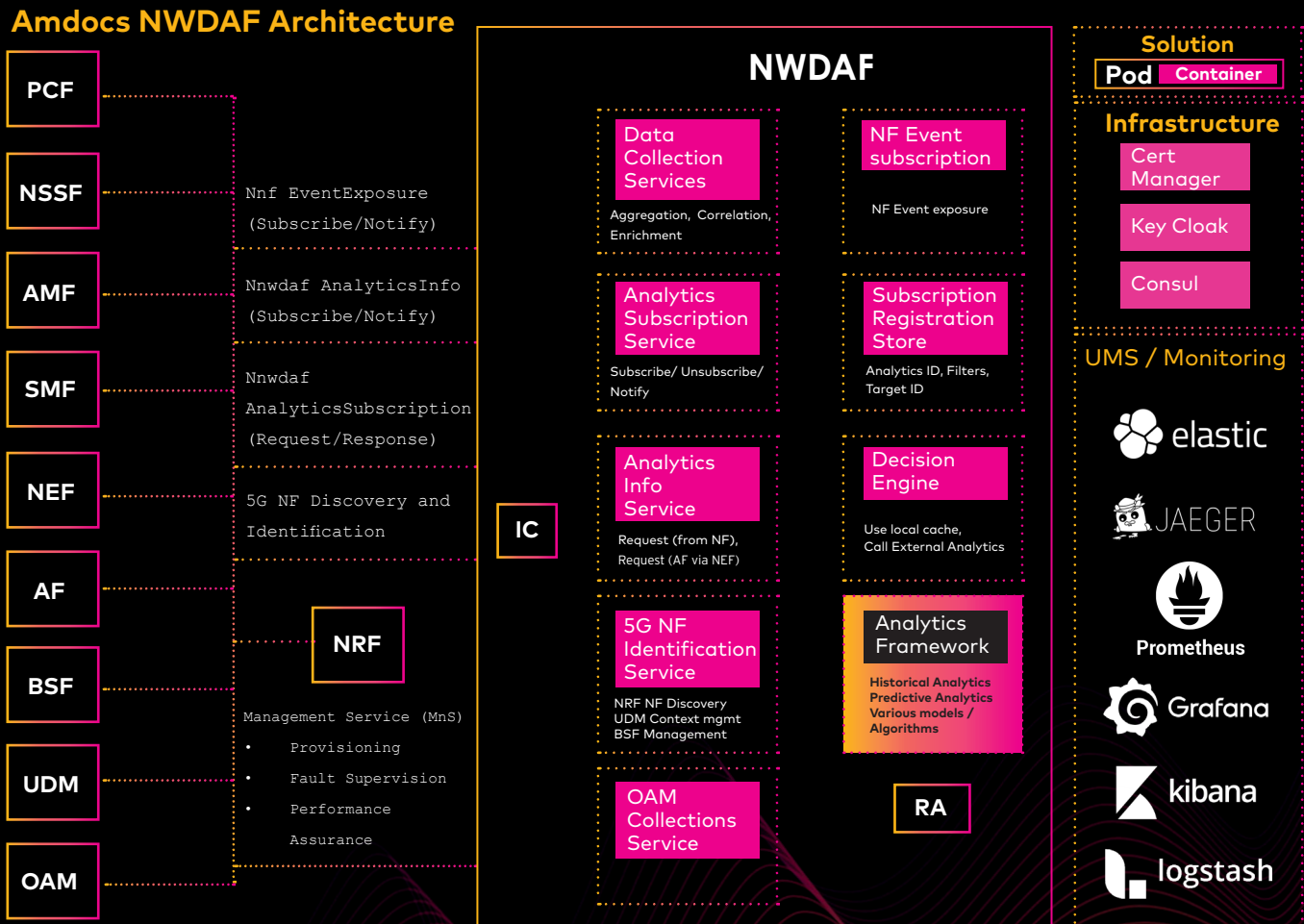
- **Closed Loop Automation:** Combining analytics, AI and Policy to automate service performance and network optimisation. Essential to guaranteeing QoE (Quality of Experience), while ensuring productivity and operational savings
- **Auto-Discovery Insights:** Providing insights through auto-discovery which are essential for the creation of new services, offer innovation on a per network slice basis and overall monetisation of the 5G network

High Level Architecture

Main Components of Amdocs NWDAF Architecture:

- NWDAF Core - Responsible for collecting data from the network and exposing interfaces
- ODF - Responsible for data processing, persistence and querying
- ML - Responsible for model training, model management and prediction

Figure 1: NWDAF Micro-services and Support for 3GPP-specified NWDAF Services and Service Operations



Why Amdocs for NWDAF

Amdocs have a proven track record for building carrier-grade 5G core network functions. The introduction of artificial intelligence will further enhance PCF, "The Brain of the Network", to make it even smarter. Combined with Amdocs Network, Amdocs DataOne assets provide the analytics capabilities and enable end-to-end coverage to facilitate 5G monetisation by combining PCC (PCF + CHF) integration with OAM (Amdocs Neo) service orchestration.

NWDAF Qualifications:

- Amdocs is a leader in Policy and Charging 5G network functions
- Established relationships and NDA with key 5GxC vendors
- Corporate mantra of standards compliance, vendor agnosticism and openness
- Pure Cloud Native approach to all solutions
- Working relationships with Microsoft Azure, Amazon Web Services and Google Cloud
- Amdocs has extensive pedigree in synthesising massive volumes of network-generated data
- Amdocs acquisition brings new resources with analytics and Machine Learning expertise