CygNet MaSoN: Analytics and Machine Learning Enabled Management System for 5G Networks

NMSWorks' 5G product/solution for 5G is a 5G network management system named CygNet MaSoN (Manager for Softwarized Networks) which integrates with 5G Core, NG-RAN and VNF Manager (VNFM). CygNet MaSoN is an integrated Network Management System (NMS) and Element Management System (EMS) supporting both Network and Element Management functionalities for all the network functions across 5G Core and NG-RAN.

It is a unified management layer (which is specified as the EM component in ETSI NFV MANO architecture) across the 5G RAN and the 5G-Core xNFs (Virtual Network Functions: VNFs & Physical Network Functions: PNFs) providing functions such as Resource Management (RM), Fault Management (FM), Performance Management (PM) and Configuration Management (CM).

MaSoN aggregates data collected from various functions and components in a 5G network which is stored in its database and presented to the users. In addition, MaSoN supports analytics and ML capabilities to provide advanced insight and automation features as value addition for 5G network management. These include detection of degradation in network performance, predication of anomalous network behaviour, prediction of service quality and resource optimization which are published and also used to suggest and recommend corrective actions to overcome the problems identified. MaSoN has an associated ML Server component which supports training multiple ML Models (includes Deep Learning models and Reinforcement Learning RL models) based on data collected for the different use cases and also prediction of network problems and anomalies using the models.

In order to perform the above functionalities, MaSoN provides a South Bound Interface (SBI) that integrates with the NFs over the RESTful API. It supports a North Bound Interface (NBI) for integration with the Orchestration systems (e.g. Open Network Automation Platform: ONAP, Open Source MANO: OSM) and Operations Support System (OSS) to publish the correlated faults/events and to support retrieval of aggregated performance data and resource information over REST API. It also supports a NETCONF interface for configuration management. In addition, it exposes the processed analytics data to Orchestration systems and OSSs so that they can process and take high-level coordinated actions.

Since MaSoN has aggregated data across multiple RAN NFs and Core NFs, it supports analytics and ML capabilities that span multiple network functions and 5G network segments from a management perspective.

CygNet MaSoN Architecture