An NFV/SDN based architecture for Autonomic 5G Network Management using Machine Learning

The core objective of CogNet is to develop an open, scalable and high performing real-time network management platform that processes data from multiple network nodes and enables autonomic infrastructure management while demonstrating the capability to scale of the network topologies and address the levels of resource optimisation required by 5G.

CogNet project aims at targeting the following 5G challenges:

- Network Resource Allocation
- Network Security & Resilience
- Network Performance Degradation
- Energy Efficiency
- Big Data Management
- Network Traffic Management

CogNet Architecture

- Network Function Virtualization infrastructure (NFVI)
- Virtual Network Function (VNFs)
- Management and orchestration block (MANO) based on NFV ETSI standard
- Machine Learning (ML) block which consists of the following blocks:
  - **CogNet Smart Engine**: receives and pre-processes records, selects algorithms, then applies selected models
  - **CogNet Optimizer**: transforms the outputs of CSM into optimisation functions
  - **Policy Distribution and Recommender**: translates the policies from the Policy Repository and send them directly to the MANO Block, Tenant Controller and OSS/BSS/VTN

How Machine-Learning algorithms can help the network environment:

- Traffic classification
- Anomaly detection
- Demand forecasting
- Autonomous policy generation
- Visualization

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