# NFV AN presentation on management data analytics function (MDAF)

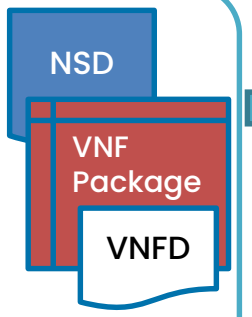
Presented by: Haitao XIA (MDAF spec rapporteur)

For: TM Forum AN MSDO session

27/03/2023

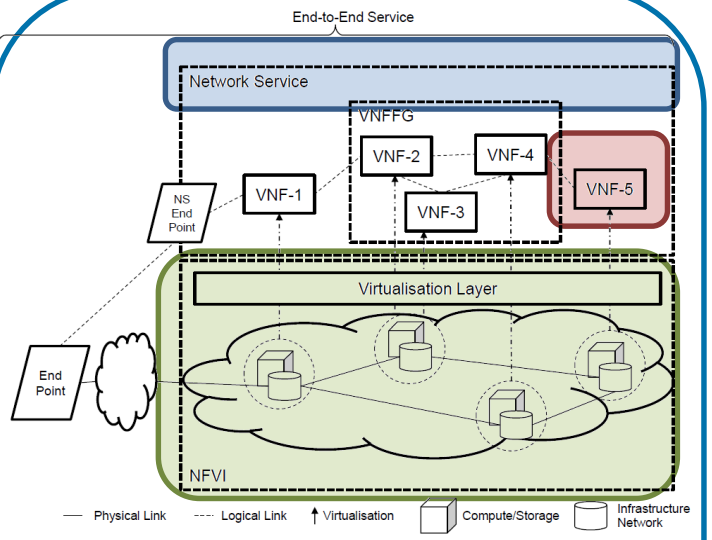
# A reminder on NFV concepts

From design



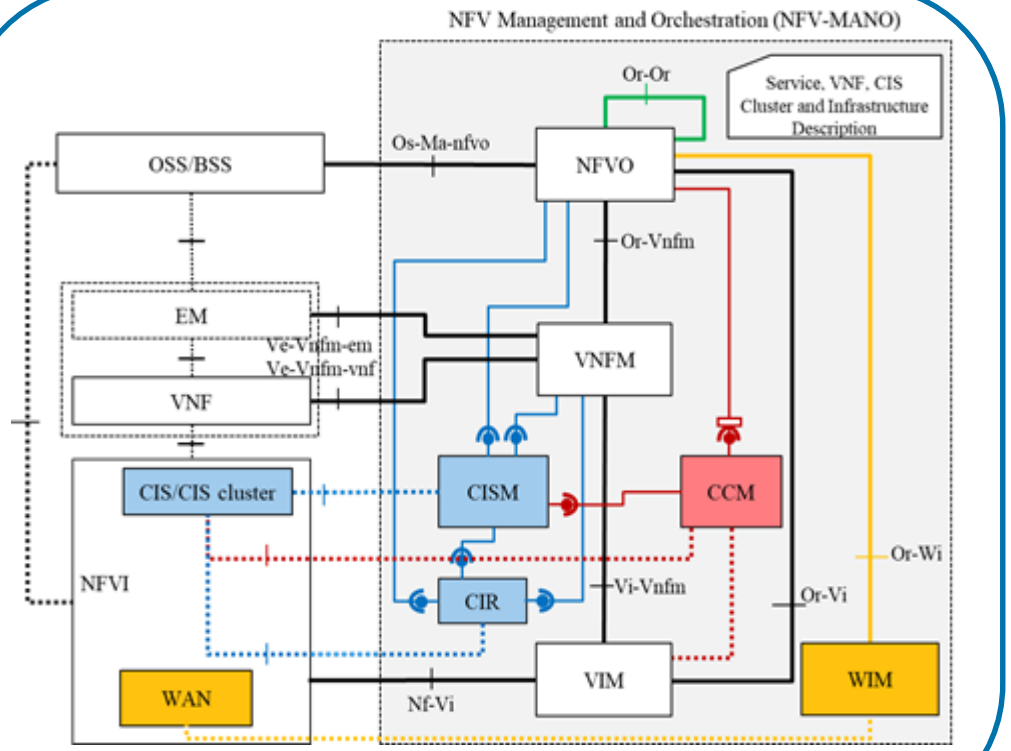

NFV descriptors and packages

to runtime




NS and VNF deployed on a virtualised infrastructure

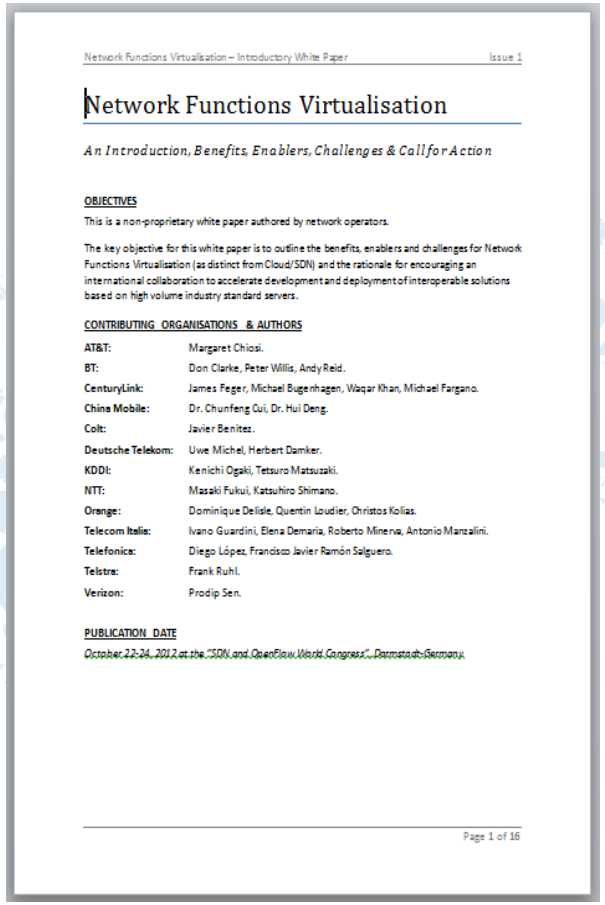
through NFV-MANO




The ETSI NFV Architectural Framework

# Overall view of automation in NFV

- NFV Management and Orchestration functions (NFV-MANO) provide automation features from their inception.
- A policy management framework was added in Release 3.
- Unprecedented operational agility and efficiency requirements bring the need for a higher degree of automation.
- Release 4 develops features and capabilities to increase the levels of automation of the NFV-MANO
  - Management data analytics
  - Intent management
- Release 5 studies the use of cognitive techniques on operations data for reliability purpose



Network Functions Virtualisation – Introductory White Paper Issue 1

Network Functions Virtualisation

*An Introduction, Benefits, Enablers, Challenges & Call for Action*

OBJECTIVES

This is a non-proprietary white paper authored by network operators.

The key objective for this white paper is to outline the benefits, enablers and challenges for Network Functions Virtualisation (as distinct from Cloud/SDN) and the rationale for encouraging an international collaboration to accelerate development and deployment of interoperable solutions based on high volume industry standard servers.

CONTRIBUTING ORGANISATIONS & AUTHORS

| | |
|---|---|
| AT&T: | Margaret Chiosi. |
| BT: | Don Clarke, Peter Willis, Andy Reid. |
| CenturyLink: | James Feger, Michael Bugenhagen, Waqar Khan, Michael Fargano. |
| China Mobile: | Dr. Chunfeng Cui, Dr. Hui Deng. |
| Colt: | Javier Benitez. |
| Deutsche Telekom: | Uwe Michel, Herbert Damker. |
| KDDI: | Kenichi Ogaki, Tetsuro Matsuzaki. |
| NTT: | Masaki Fukui, Katsuhiro Shimano. |
| Orange: | Dominique Delisle, Quentin Loudier, Christos Kolias. |
| Telecom Italia: | Ivano Guardini, Elena Demaria, Roberto Minerva, Antonio Manzalini. |
| Telefonica: | Diego López, Francisco Javier Ramón Salguero. |
| Telstra: | Frank Ruhl. |
| Verizon: | Prodip Sen. |

PUBLICATION DATE

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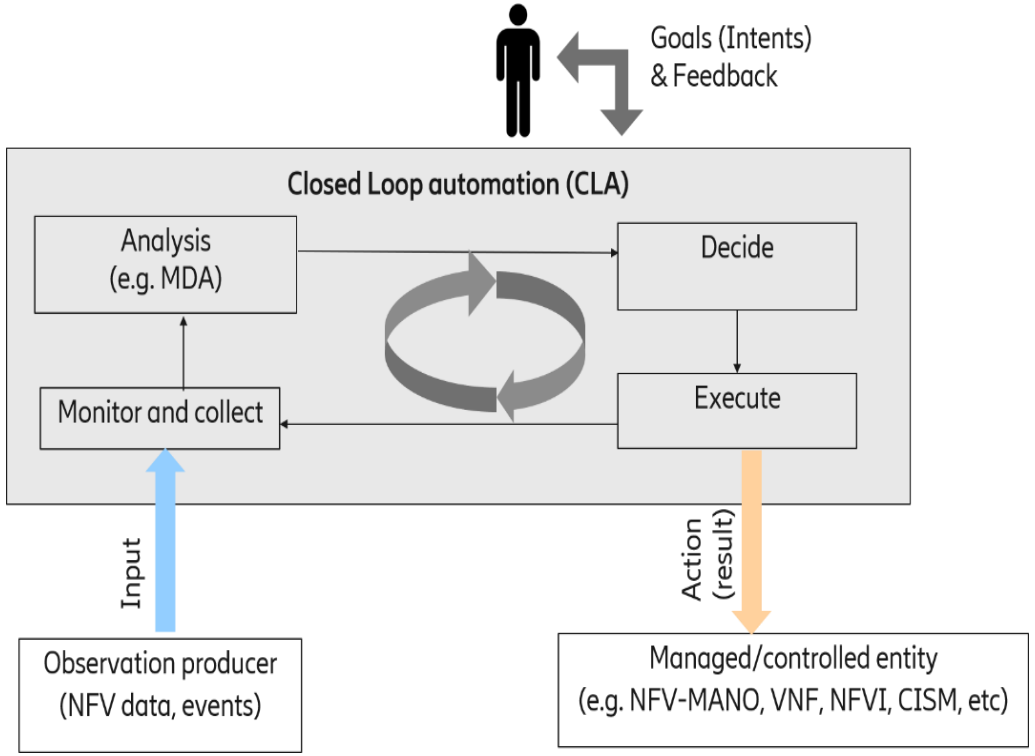
*"NFV will only scale if all of the functions can be automated."*
From the Seminal NFV White Paper, 2012

# Closed loop automation in NFV domain

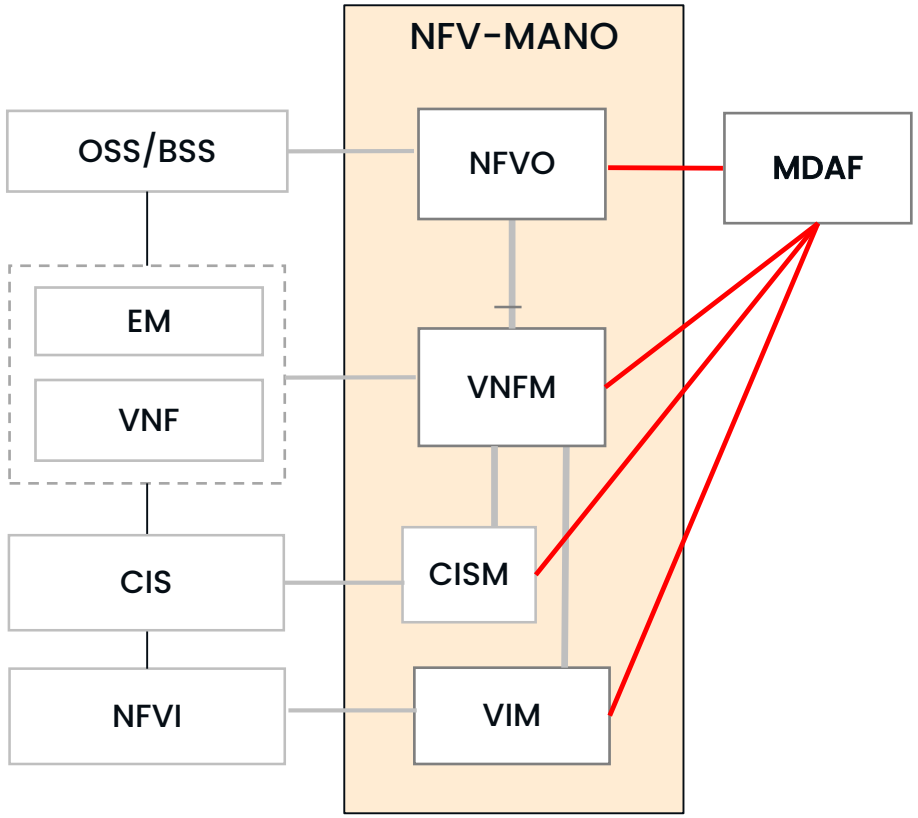



*Source: ETSI GR NFV-IFA 041 v4.1.1*

*" Report on enabling autonomous management in NFV-MANO"*

- Under the Autonomous Network umbrella, functionality in NFV domain can be part of closed loop automation (CLA).
- CLA consists of circular steps of
  1. Monitoring and management data collection (input)
  2. (Any number of) analysis and decision-making
  3. Execution of actions (output)
- MDA function (MDAF), in conjunction with AI and ML techniques, brings intelligence and automation to NFV-MANO, especially for NS management and orchestration.
- Decision making of NFV-MANO can be improved with the MDAF, which results in reduced on-demand requests from the OSS/BSS, and increased self-detection/self-recovery operations in NFV domain.

# Architectural aspects of the MDAF




- The MDAF can be located in NFV-MANO, or external to NFV-MANO.
- The MDAF collects management data from multiple sources (e.g., NFVO, VNFM, CISM, VIM), as input to its internal MDA process.
  - Alarm notifications
  - Performance measurements
  - States of managed objects
  - Configuration of managed objects
  - VNF indicators
- The MDAF receives MDA requests from its consumer (e.g., NFVO, or other OSS), executes the MDA process, and returns the analytics output to the consumer.

NOTE: This figure is simplification of the NFV architecture framework (in Slide 2) focused on depicting known potential interactions of the MDAF.

# MDA service interface specification

- MDA service interface and information model specification in ETSI GS NFV-IFA 047 (v4.4.1), is just published in March 2023.
- MDA service requirements and corresponding service interface requirements are defined.
- Current version specifies one interface, the "Data Analytics" interface, which adopts asynchronous operations to respond to MDA requests.
- Key information elements
  Control attributes (as input), guide the output to the data analytics process
  - time interval of management data to be used (in the MDA process),
  - location areas from which available management data is to be involved
  - NFV MANO object instances
  Analytics output, returns the output info of a data analytics process
  - the time when the Data Analytics output is generated
  - recommended actions to follow up

# Correlated work: enhanced alarm models

CPU_CRITICAL

a) **Alarm definition identifier:** CPU_CRITICAL

b) **Description:** One or multiple CPUs supporting the virtual CPU used by the virtualised compute resource have service affecting conditions and the CPU is not fully operational.

c) **Managed object type:** VirtualCpu

d) **Event type:** EQUIPMENT_ALARM

e) **Perceived severity:** CRITICAL

f) **Probable cause:** One of the probable causes specified in table 7.2.1.1-1 for the applicable managed object type.

g) **Fault details:** Depending on the value of the probable cause, zero, one or multiple occurrences of the following strings:

- "cpuId=$cpuId", wherein "$cpuId" indicates the CPU id associated to the issue.

*An example of virtual CPU alarm specification with severity "CRITICAL"*

- To allow better data analytics, the MDAF needs to collect high-quality management data with rich semantics.
- With this regards, and also other purpose such as interoperability, ISG NFV is working on alarm modelling enhancement in NFV domain, as specified in draft NFV-IFA045.
- Alarm modelling is specified in a new template (see example) to better categorize NFV managed objects and their associated alarms in a fine granular way.

# Where to find further information

- NFV Bits on YouTube:
  https://www.youtube.com/user/ETSIstandards
- ETSI NFV drafts and Releases documentation:
  https://docbox.etsi.org/ISG/NFV/Open/
- ETSI NFV published standards:
  https://www.etsi.org/committee/1427-nfv
- ETSI NFV blog:
  https://www.etsi.org/newsroom/blogs/blog-nfv
- ETSI NFV webpage:
  https://www.etsi.org/technologies/nfv

# Any further questions?

Contact me:

xiahaitao@huawei.com