SLOVENSKI STANDARD
SIST ES 203 682 V1.1.1:2020

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Okoljski inženiring (EE) - Zelena abstraktna plast (GAL) - Zmožnosti upravljanja energije v prihodnjih energijskih vozliščih fiksnega telekomunikacijskega omrežja - Izboljšan vmesnik za upravljanje energije v okoljih omrežne funkcije za virtualizacijo (NFV)

Environmental Engineering (EE) - Green Abstraction Layer (GAL) - Power management capabilities of the future energy telecommunication fixed network nodes - Enhanced Interface for power management in Network Function Virtualisation (NFV) environments

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**Environmental Engineering (EE);
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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Environmental Engineering (EE).

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

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Introduction

Green Abstraction Layer (GAL) ETSI ES 203 237 [1] provides means of exchanging information about capabilities and parameter settings between energy-aware networking devices and their network management primitives. It allows hiding the specificities of devices and their internal operations by means of an abstract interface, through which only a description of energy-related parameters can be conveyed, read and configured.

The scenario introduced by the advent of Network Function Virtualisation possibly accompanied by the further increase in flexibility and programmability brought forth by Software Defined Networking, is changing the network paradigms and the associated GAL design. With NFV, network functionalities become virtualised network functions which can be automatically deployed, migrated, re-configured. The same physical machines of a provider's infrastructure may well serve the needs of different VNFs. In this NFV context, establishing a mapping between the Energy-Aware States of logical entities (e.g. virtualised network functions) and the energy consumption of the hardware hosting the Virtual Machines that execute these logical entities is a challenging task. There is therefore the need to adapt the GAL specification ETSI ES 203 237 [1] to the NFV environment (GALv2), and to address the use of GALv2 in the ETSI NFV architectural framework ETSI GS NFV 002 [i.1].

The present document was developed jointly by ETSI TC EE and ITU-T Study Group 5. It is published respectively by ITU and ETSI as ETSI ES 203 682 (the present document) and Recommendation ITU-T L.1362 [i.6], which are technically-equivalent.

1 Scope

The present document proposes an evolved version of the Green Abstraction Layer formulation capable of operating within ETSI NFV environments.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

[1] ETSI ES 203 237: "Environmental Engineering (EE); Green Abstraction Layer (GAL); Power management capabilities of the future energy telecommunication fixed network nodes".

[2] ETSI GS NFV-IFA 005: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Or-Vi reference point - Interface and Information Model Specification".

[3] ETSI GS NFV-IFA 006: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Vi-Vnfm reference point - Interface and Information Model Specification".

[4] ETSI GS NFV-IFA 007: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Or-Vnfm reference point - Interface and Information Model Specification".

[5] ETSI GS NFV-IFA 008: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Ve-Vnfm reference point - Interface and Information Model Specification".

[6] ETSI GS NFV-IFA 011: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; VNF Descriptor and Packaging Specification".

[7] ETSI GS NFV-IFA 013: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Os-Ma-Nfvo reference point - Interface and Information Model Specification".

[8] ETSI GS NFV-IFA 014: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Network Service Templates Specification".

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI GS NFV 002: "Network Functions Virtualisation (NFV); Architectural Framework".

[i.2] ETSI GS NFV 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".

[i.3] ETSI GS NFV-EVE 001: "Network Functions Virtualisation (NFV); Virtualisation Technologies; Hypervisor Domain Requirements specification; Release 3".

[i.4] Recommendation ITU-T E.800: "Terms and definitions related to quality of service and network performance including dependability".

[i.5] ETSI GS NFV-INF 004: "Network Functions Virtualisation (NFV); Infrastructure; Hypervisor Domain".

[i.6] Recommendation ITU-T L.1362: "Interface for power management in NFV environments "Green Abstraction Layer 2".

[i.7] ETSI GS NFV-IFA 027: "Network Functions Virtualisation (NFV) Release 2; Management and Orchestration; Performance Measurements Specification".

3 Definition of terms, symbols and abbreviations

3.1 Terms

For the purposes of the present document, the following terms apply:

adaptive rate: technique to dynamically modulate the capacity of a network device or a sub-component in order to meet the traffic requirements

NOTE: Available in ETSI ES 203 237 [1].

advanced configuration and power interface: provides an open industrial standard for device configuration and power management by the operating system

NOTE: Available in ETSI ES 203 237 [1].

convergence layer interface: GAL interface designed to map the GAL commands and data into low-level configuration registers/APIs

NOTE: Available in ETSI ES 203 237 [1].

Energy-Aware Entity (EAE): network entity that can adapt its energy consumption such as network performance levels are satisfied

NOTE: Examples include central processing unit (CPU), virtual CPU, virtual machine, virtualised network function.

Energy-Aware State (EAS): data structure containing power, network performance, available functionalities, and responsiveness information characterizing an Energy-Aware Entity

NOTE: It can be configured by control plane processes through the Green Standard Interface.

entity: device or a sub-part of it, of which the GAL constitutes the energy-aware interface

NOTE 1: At the lowest hierarchical levels, an entity can correspond to a chip, a network processor, a link interface. At medium hierarchical levels, it can correspond to line-cards, chassis, etc. At the highest level the entire device corresponds to an entity. Higher level entities can include one or more entities at lower levels. This hierarchical architecture is optional and the relative depth should depend on the specific internal architecture of the network device.

NOTE 2: Available in ETSI ES 203 237 [1].