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STN	**Environmentálne inžinierstvo (EE) Metodika a metrika merania energetickej účinnosti pre virtualizáciu sieťových funkcií (NFV)**	**STN EN 303 471 V1.1.1** 87 3471

Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for Network Function Virtualisation (NFV)

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This standard includes the English version of the European Standard.

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

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

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Introduction

The present document specifies the method and metrics to determine the energy efficiency of operational Network Function Virtualisation (NFV) applications and their associated infrastructure.

Any such implementation of NFV within the access network served is addressed by the general engineering and associated energy management KPIs of the access network itself as described in ETSI EN 305 200-2-2 [i.2], ETSI EN 305 200-2-3 [i.3] and ETSI GR NFV 001 [i.4].

1 Scope

The present document specifies the method and metrics to determine the energy efficiency of operational Network Function Virtualisation (NFV) applications and their associated infrastructure when that infrastructure is implemented outside the boundaries of the access fixed, cable and mobile networks which they serve.

The present document:

- Extends the Objective KPIs of ETSI EN 305 200-2-2 [i.2] (fixed access networks) and ETSI EN 305 200-2-3 [i.3] (mobile access networks) to assess the impact of NFV when applied to those networks as described in ETSI GR NFV 001 [i.4].
- Does not consider any assessment of energy saved by the implementation of NFV as there can be no time-stamped comparison of an operational infrastructure from which functions have been removed to a virtualized environment.

NOTE: In an ICT network (e.g. a fixed access network) comprising many Network Distribution Nodes (NDNs) with different loading levels it is not clear that there will always be an energy consumption benefit - the more relevant benefit being network and operational flexibility (such as reduced maintenance or increased reliability).

The present document:

- Does not address the operational energy efficiency of specific Information Technology Equipment (ITE) such as servers which may provide NFV facilities. Other ETSI EN documents (e.g. ETSI EN 303 470 [i.1]) have been prepared to address such factors.
- Does not specify any assessment of the overall effectiveness of an NFV implementation although it contains information in an informative annex regarding the technical milestones that would be required for this to be addressed in a future revision of the present document.

The KPIs specified are primarily intended for trend analysis - not to enable comparison between individual implementations of NFV unless the conditions of operation are "similar".

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.

Referenced documents which are not found to be publicly available in the expected location might be found at https://docbox.etsi.org/Reference/.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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

[1] ETSI ES 202 336-12: "Environmental Engineering (EE); Monitoring and control interface for infrastructure equipment (power, cooling and building environment systems used in telecommunication networks); Part 12: ICT equipment power, energy and environmental parameters monitoring information model".

2.2 Informative 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 not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] ETSI EN 303 470: "Environmental Engineering (EE); Energy Efficiency measurement methodology and metrics for servers".

[i.2] ETSI EN 305 200-2-2: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs; Part 2: Specific requirements; Sub-part 2: Fixed broadband access networks".

[i.3] ETSI EN 305 200-2-3: "Access, Terminals, Transmission and Multiplexing (ATTM); Energy management; Operational infrastructures; Global KPIs; Part 2: Specific requirements; Sub-part 3: Mobile broadband access networks".

[i.4] ETSI GR NFV 001: "Network Functions Virtualisation (NFV); Use Cases".

[i.5] ETSI GS NFV 003: "Network Functions Virtualisation (NFV); Terminology for Main Concepts in NFV".

[i.6] ETSI GS NFV-TST 008: "Network Functions Virtualisation (NFV) Release 2; Testing; NFVI Compute and Network Metrics Specification".

[i.7] ISO/IEC 17788: "Information technology -- Cloud computing -- Overview and vocabulary".

[i.8] Mandate M/462: "Standardisation mandate addressed to CEN, CENELEC and ETSI in the field of ICT to enable efficient energy use in fixed and mobile information and communication networks".

[i.9] CEN-CENELEC-ETSI (12-2011): "Framework Document for ESO Response to EU Mandate M/462".

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