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Information Technology — Data centres — Application Platform Energy Effectiveness (APEE)

Technologies de l'information — Centres de traitement de données — Efficacité énergétique des plateformes d'applications (APEE)

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Foreword

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability, IT & Data Centres*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national -committees.

Introduction

The growth of the Internet of Things (IoT) has resulted in the storage of increasingly large amounts of data in data centres and the increased utilization of this data by technologies such as artificial intelligence (AI). As a result, energy consumption of data centres is also increasing. In this recent utilization of large amounts of data by technologies such as AI, various kinds of data are combined and analysed, and processing requests for such combinations and analysis are also increasing. Middleware, such as a database management system (DBMS), is also becoming more important for this data utilization. The energy effectiveness of application platforms can be greatly improved through the selection of middleware.

In addition to improving the energy effectiveness of target IT equipment itself, it is necessary to improve application platform energy effectiveness by choosing an optimally energy-effective combination of target IT equipment, operating systems and middleware.

Although there are several KPIs for the energy effectiveness of target IT equipment itself (for example, ISO/IEC 30134-4, ISO/IEC 21836), there have previously been no KPIs for energy effectiveness to calculate the energy effectiveness of a combination of target IT equipment, operating systems and middleware. This document, therefore, introduces a KPI for the energy effectiveness of an entire application platform. A typical use case of application platform energy effectiveness (APEE) is a criterion for procuring an energy efficient application platform for an IT service.

This KPI provides assistance in selecting an optimal application platform for energy effectiveness. This KPI does not apply to the energy effectiveness of an entire data centre. The colloquial term of "efficiency" is commonly used in regional programmes and "effectiveness" can be referenced as "efficiency" in those programmes.

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Information Technology — Data centres — Application Platform Energy Effectiveness (APEE)

1 Scope

This document specifies application platform energy effectiveness (APEE) as a Key Performance Indicator (KPI) which quantifies the energy effectiveness of an application platform for an IT service in data centres. This KPI evaluates the energy consumption of an application platform prior to deployment. The purpose of this KPI is to measure the energy effectiveness of a set of target IT equipment, operating systems and middleware, to enable the selection of an energy effective IT stack.

This document specifies a formula for calculating APEE and definitions of components of the formula.

This document specifies a measurement method for assessing and reporting the energy effectiveness of an application platform.

This document also specifies requirements for benchmarks to be used for APEE and requirements for reporting.

The following topics are outside of the scope of this document:

1) KPIs intended to solely evaluate the energy effectiveness of target IT equipment hardware,

2) energy effectiveness of data centre facilities.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 21836:2020, *Information technology — Data centres — Server energy effectiveness metric*

ISO/IEC 21878, *Information technology — Security techniques — Security guidelines for design and implementation of virtualized servers*