TECHNICAL REPORT

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Information technology — Information technology sustainability — Energy efficient computing models —

Part 1: Guidelines for energy effectiveness evaluation

Technologies de l'information — Disponibilité des technologies de l'information — Modèles informatisés à efficacité énergétique —

Partie 1: Lignes directrices pour l'évaluation de l'effectivité énergétique

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, Subcommittee SC 39, *Sustainability for and by Information Technology*.

A list of all parts of the ISO/IEC 30132 series can be found on the ISO website.

Introduction

The world is experiencing explosive growth of data from mobile client devices, cloud services, social networks, online television, the Internet of things, big data and from traditional enterprise computing. The growth of data has been accompanied by a growth in the energy usage and carbon footprint of IT along with increased costs. Much research has been performed regarding energy management for the last two decades, most focusing on the evaluating and improving energy efficiency of individual components or systems such as processors, memory, wireless networks base stations, laptops, supercomputers, data centres, handheld devices and so on. However, several disparate systems, or systems of systems, collectively use energy to accomplish a given task and satisfy service-level expectations. Consider, for example, someone who takes a photo with a smartphone and posts it to a social network for their friends to view. Taking and transmitting the photo consumes energy from the smartphone while the data transfer, processing and storage consumes energy too. Likewise, when friends view the photo, that activity will consume additional energy. To improve energy effectiveness, it is necessary to consider the end-to-end energy use of a task or service involving multiple systems.

The ISO/IEC 30132 series provides guidelines for the end-to-end evaluation of energy effectiveness of a reference computing model and suggestions for determining the energy effectiveness of a computing model. This document comprises guidelines for energy effectiveness evaluation, including a reference computing model that includes end-to-end data transfer, processing and storage.

Information technology — Information technology sustainability — Energy efficient computing models —

Part 1: Guidelines for energy effectiveness evaluation

1 Scope

This document establishes guidelines for improving the energy effectiveness for computing models. Specifically, this document provides

— a reference computing model for evaluating end-to-end energy effectiveness,

— a holistic framework for evaluating the applicability of energy effectiveness improving technologies, and

— guidelines for evaluating energy effectiveness.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 13273-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at https://www.iso.org/obp/

3.1
energy effectiveness
end-to-end total amount of data transferred, processed and stored per unit energy of a computing model

4 Abbreviated terms

ARP	address resolution protocol
BNG	broadband network gateway
DHCP	dynamic host configuration protocol
DSL	digital subscriber loop
DSLAM	DSL access multiplexer
FTTN	fibre-to-the-node
FTTP	fibres-to-the-premises