
**Information technology — Data
centres — Key performance
indicators —**

**Part 1:
Overview and general requirements**

*Technologies de l'information — Centres de données — Indicateurs de
performance clés —*

Partie 1: Aperçu et exigences générales

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO documents 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*, SC 39, *Sustainability for and by Information Technology*.

ISO/IEC 30134 consists of the following parts, under the general title *Information technology — Data centres — Key performance indicators*:

- *Part 1: Overview and general requirements*
- *Part 2: Power usage effectiveness (PUE)¹⁾*
- *Part 3: Renewable energy factor (REF)*

The following parts are under preparation:

- *Part 4: IT equipment energy efficiency for servers (ITEE)*
- *Part 5: IT equipment utilization for servers (ITEU_SV)*

Additional parts will be developed, each describing a specific KPI for resource usage effectiveness or efficiency.

1) It is recognized that the term “efficiency” should be employed but “effectiveness” provides continuity with earlier market recognition of the term.

Introduction

The global economy is now reliant on information and communication technologies and the associated generation, transmission, dissemination, computation and storage of digital data. All markets have experienced exponential growth in that data, for social, educational and business sectors and, while the internet backbone carries the traffic, there are a wide variety of data centres at nodes and hubs within both private enterprise and shared/collocation facilities.

The historical data generation growth rate exceeds the capacity growth rate of the information and communications technology hardware and, with less than half (in 2014) of the world's population having access to an internet connection, that growth in data can only accelerate. In addition, with many governments having "digital agendas" to provide both citizens and businesses with ever-faster broadband access, the very increase in network speed and capacity will, by itself, generate ever more usage (Jevons Paradox). Data generation and the consequential increase in data manipulation and storage are directly linked to increasing power consumption.

With this background, it is clear that data centre growth, and power consumption in particular, is an inevitable consequence and that growth will demand increasing power consumption despite the most stringent energy efficiency strategies. This makes the need for key performance indicators (KPIs) that cover the effective use of resources (including but not limited to energy) and the reduction of CO₂ emissions essential.

Within the ISO/IEC 30134 series, the term "resource usage effectiveness" is more generally used for KPIs in preference to "resource usage efficiency", which is restricted to situations where the input and output parameters used to define the KPI have the same units.

In order to enable the optimum resource effectiveness of data centres, a suite of effective KPIs is needed to measure and report on resources consumed in order to develop an improvement roadmap.

The ISO/IEC 30134 series is intended to accelerate the provision of operational infrastructures with improved resource usage effectiveness.

The common objective of the KPIs is the effective or efficient use of resources. Examples are as follows:

- a) the minimization of energy and other resource (e.g. water) consumption;
- b) the task effectiveness of the IT load (data processing, storage and transport) within the data centre, maximizing the IT output with the minimum energy consumption;
- c) the energy reuse in the form of waste heat, if possible;
- d) the use of renewable energy, both generated on site and off site.

The ISO/IEC 30134 series do not specify limits or targets for any KPI and do not describe or imply, unless specifically stated, any form of aggregation of individual KPIs into a combined nor an overall KPI for data centre resource usage effectiveness or efficiency.