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Information technology – Data centre facilities and infrastructures
Part 1: General concepts

Informationstechnik –
Einrichtungen und Infrastrukturen von Rechenzentren –
Teil 1: Allgemeine Konzepte

Technologie de l'information –
Installation et infrastructures de centres de traitement de données –
Partie 1: Concepts généraux

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National Foreword

This European Standard EN 50600-1:2019 has the status of an Austrian electrotechnical standard in accordance with the Austrian Electrical Engineering Act 1992.

The legal status of this Austrian electrotechnical standard is stated in the respective ordinance under the Electrical Engineering Act.

European Standards (EN) are implemented as Austrian electrotechnical standards according to the CENELEC Internal Regulations by publication of an identical text and by adding OVE to the EN number.

According to the foreword of the EN the latest date by which the national (electrotechnical) standards conflicting with the EN have to be withdrawn is 2022-04-29 (dow, date of withdrawal). Until this deadline the following standard may be applied:

ÖVE/ÖNORM EN 50600-1:2013-06-01.

EUROPEAN STANDARD **EN 50600-1**

EUROPÄISCHE NORM

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English Version

Information technology - Data centre facilities and infrastructures - Part 1: General concepts

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This European Standard was approved by CENELEC on 2019-04-29. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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Contents

European foreword

This document (EN 50600-1:2019) has been prepared by CLC/TC 215 “Electrotechnical aspects of telecommunication equipment”.

The following dates are fixed:

- latest date by which this document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020–04–29
- latest date by which the national standards conflicting with this document have to be withdrawn (dow) 2022–04–29

This document supersedes EN 50600-1:2012.

The following major modifications have been made compared to EN 50600-1:2012:

a) reference to Key Performance Indicators of EN 50600-4-X included;

b) Clause 7 (Availability) has been revised;

c) the design processes (Clause 8) and design principles (Clause 9) have been moved from an annex to the main body of the document;

d) existing Annex A has been removed;

e) new Annexes A and B have been added.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Introduction

The unrestricted access to internet-based information demanded by the information society has led to an exponential growth of both internet traffic and the volume of stored/retrieved data. Data centres are housing and supporting the information technology and network telecommunications equipment for data processing, data storage and data transport. They are required both by network operators (delivering those services to customer premises) and by enterprises within those customer premises.

Data centres usually need to provide modular, scalable and flexible facilities and infrastructures to easily accommodate the rapidly changing requirements of the market. In addition, energy consumption of data centres has become critical both from an environmental point of view (reduction of environmental footprint) and with respect to economical considerations (cost of energy) for the data centre operator.

The implementation of data centres varies in terms of:

a) purpose (enterprise, co-location, co-hosting or network operator facilities);

b) security level;

c) physical size;

d) accommodation (mobile, temporary and permanent constructions).

The needs of data centres also vary in terms of availability of service, the provision of security and the objectives for energy efficiency. These needs and objectives influence the design of data centres in terms of building construction, power distribution, environmental control, telecommunications cabling and physical security as well as the operation of the data centre. Effective management and operational information is required to monitor achievement of the defined needs and objectives.

Recognizing the substantial resource consumption, particularly of energy, of larger data centres, it is also important to provide tools for the assessment of that consumption both in terms of overall value and of source mix and to provide Key Performance Indicators (KPIs) to evaluate trends and drive performance improvements.

At the time of publication of this European Standard, EN 50600 series is designed as a framework of standards and technical reports covering the design, the operation and management as well as the key performance indicators for energy efficient operation of the data centre.

The EN 50600-2 series defines the requirements for the data centre design.

The EN 50600-3 series defines the requirements for the operation and the management of the data centre.

The EN 50600-4 series defines the key performance indicators for the data centre.

The CLC/TR 50600-99-X Technical Reports cover recommended practices and guidance for specific topics around data centre operation and design.

This series of European Standards specifies requirements and recommendations to support the various parties involved in the design, planning, procurement, integration, installation, operation and maintenance of facilities and infrastructures within data centres. These parties include:

1) owners, operators, facility managers, ICT managers, project managers, main contractors;

2) consulting engineers, architects, building designers and builders, system and installation designers, auditors, test and commissioning agents;

3) facility and infrastructure integrators, suppliers of equipment;

4) installers, maintainers.

The inter-relationship of the standards and technical reports within the EN 50600 series is shown in Figure 1.

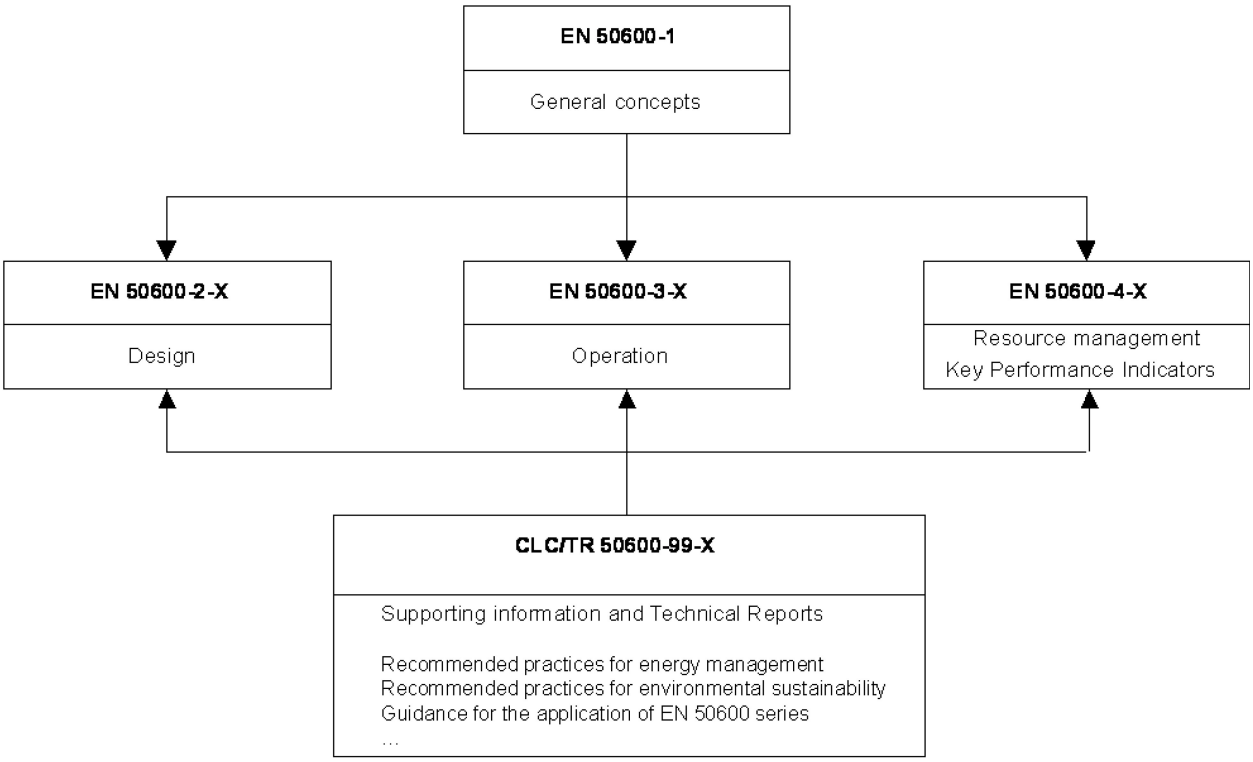

Figure 1 – Schematic relationship between EN 50600 series of standards

This European Standard specifies general requirements for data centres for all kinds of data centres irrespective of their size and physical construction. It introduces a classification system for availability, physical security and energy efficiency enablement.

EN 50600-2-X standards specify requirements and recommendations for particular facilities and infrastructures to support the relevant classification for “availability”, “physical security” and “energy efficiency enablement” selected from EN 50600-1.

EN 50600-3-X documents specify requirements and recommendations for data centre operations, processes and management.

EN 50600-4-X documents specify requirements and recommendations for key performance indicators (KPIs) used to assess and improve the resource usage efficiency and effectiveness, respectively, of a data centre.

This European Standard is intended for use by and collaboration between architects, building designers and builders, system and installation designers.

This series of European Standards does not address the selection of information technology and network telecommunications equipment, software and associated configuration issues.

1 Scope

This document:

a) describes the general principles for data centres upon which the requirements of the EN 50600 series are based;

b) defines the common aspects of data centres including terminology, parameters and reference models (functional elements and their accommodation) addressing both the size and complexity of their intended purpose;

c) describes general aspects of the facilities and infrastructures required to support data centres;

d) specifies a classification system, based upon the key criteria of “availability”, “security” and “energy-efficiency” over the planned lifetime of the data centre, for the provision of effective facilities and infrastructure;

e) details the issues to be addressed in a business risk and operating cost analysis enabling application of the classification of the data centre;

f) provides reference to operation and management of data centres;

g) introduces the concepts of Key Performance Indicators (KPIs) for resource management of data centre facilities and infrastructures.

The following topics are outside of the scope of this series of European Standards:

1) the selection of information technology and network telecommunications equipment, software and associated configuration issues are outside the scope of this European Standard;

2) quantitative analysis of overall service availability resulting from multi-site data centres;

3) safety and electromagnetic compatibility (EMC) requirements (covered by other standards and regulations. However, information given in this European Standard can be of assistance in meeting these standards and regulations).

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.

EN 50600-2-1, *Information technology - Data centre facilities and infrastructures - Part 2-1: Building construction*

EN 50600-2-2, *Information technology - Data centre facilities and infrastructures - Part 2-2: Power supply and distribution*

EN 50600-2-3, *Information technology - Data centre facilities and infrastructures - Part 2-3: Environmental control*

EN 50600-2-4, *Information technology - Data centre facilities and infrastructures - Part 2-4: Telecommunications cabling infrastructure*

EN 50600-2-5, *Information technology - Data centre facilities and infrastructures - Part 2-5: Security systems*

EN 50600-3-1, *Information technology - Data centre facilities and infrastructures - Part 3-1: Management and operational information*

EN 50600-4-X (all parts), Information technology – Data centre facilities and infrastructures – Part 4-X

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following terms and definitions 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 http://www.iso.org/obp

3.1.1
availability
ability of an item to be in a state to perform a required function under given conditions at a given instant of time or over a given time interval, assuming that the required external resources are provided

[SOURCE: IEC 60050-191:1990, 191-02-05]

3.1.2
building entrance facility
facility that provides all necessary mechanical and electrical services and which complies with all relevant regulations for the entry of specific services or infrastructures into a building

[SOURCE: EN 50173-1:2018, 3.1.18 – modified: replaced “telecommunication cables” with “specific infrastructures or services” and deleted „and which can enable transmission from outdoor to indoor cable”]

3.1.3
building security
facilities and systems necessary to provide the required levels of security at the entrance to and within the building containing the data centre

3.1.4
cabinet
enclosed construction for housing closures and other information technology equipment

[SOURCE: EN 50174-1:2018, 3.1.7]

3.1.5
co-hosting data centre
data centre in which multiple customers are provided with access to network(s), servers and storage equipment on which they operate their own services/applications

Note 1 to entry: Both the information technology equipment and the support infrastructure of the building are provided as a service by the data centre operator.

[SOURCE: EN 50174-2:2018, 3.1.2]