



BSI Standards Publication

# Power systems management and associated information exchange

Part 200: Guidelines for migration from  
Internet Protocol version 4 (IPv4) to Internet  
Protocol version 6 (IPv6)

**National foreword**

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A list of organizations represented on this committee can be obtained on request to its secretary.

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# TECHNICAL REPORT



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**Power systems management and associated information exchange –  
Part 200: Guidelines for migration from Internet Protocol version 4 (IPv4) to  
Internet Protocol version 6 (IPv6)**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POWER SYSTEMS MANAGEMENT AND  
ASSOCIATED INFORMATION EXCHANGE –****Part 200: Guidelines for migration from Internet Protocol version 4 (IPv4)  
to Internet Protocol version 6 (IPv6)**

## FOREWORD

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IEC TR 62357-200, which is a technical report, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
57/1563/DTR	57/1580/RVC

Full information on the voting for the approval of this technical report can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62357 series, published under the general title *Power systems management and associated information exchange*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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## INTRODUCTION

This Technical Report provides definitions, guidelines, and recommendations for migration of data communication protocols which are today using the Internet Protocol version 4 (IPv4) to the Internet Protocol version 6 (IPv6).

This Technical Report addresses data communication for power systems at all voltage levels, from transmission level down to the low voltage. It is in addition useful for any other application domain which specifies the use of IP transport.

This Technical Report starts with a tutorial on the aspects of IPv4 and IPv6 technologies that are relevant for the migration.

This Technical Report addresses issues such as motivation for migration, migration strategies in general and specific application in power systems communications.

This Technical Report contains recommendations for the device manufacturers, network engineers and for standardization bodies.

This Technical Report defines a time table for the standard bodies defining data communication in power systems, as follows:

- All new or revised IEC documents support IPv6 as an option for projects that mandate it, starting in 2015.
- All IEC documents request both IPv6 and IPv4 support, while use is not mandatory, until 2030.
- All IEC documents consider IPv4 as deprecated after 2050.

## **POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE –**

### **Part 200: Guidelines for migration from Internet Protocol version 4 (IPv4) to Internet Protocol version 6 (IPv6)**

#### **1 Scope**

This part of IEC 62357, which is a Technical Report, applies to information exchange in power systems including, but not restricted to, substations, control centre, maintenance centre, energy management systems, synchrophasor-based grid stability systems, bulk energy generation (including fossil fuel plants), distributed energy generation (renewables, wind and solar), energy storage, load management (demand side management and demand response for distribution level consumers or producers).

This Technical Report addresses the issues encountered when migrating from Internet Protocol version 4 (IPv4) to the Internet Protocol version 6 (IPv6). It describes migration strategies, covering impact on applications, communication stack, network nodes, configuration, address allocation, cyber security and the related management.

This Technical Report considers backward compatibility and show concepts as well as necessary migration paths to IPv6 from IPv4 where necessary, for a number of protocols in the IEC 61850 framework.

Following a review of IEC standards and technical reports according to the reference architecture for power system information exchange (IEC 62357-1), this Technical Report supports modifications caused by the introduction of IPv6 for revision of these documents, considering the impact of permitting or requiring IPv6.

This Technical Report does not impose the use of the IPv6 technology in utility communications.

#### **2 Normative references**

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International electrotechnical vocabulary* (available at: <http://www.electropedia.org/>)

IEC 60870-5-104, *Telecontrol equipment and systems – Part 5-104: Transmission protocols – Network access for IEC 60870-5-101 using standard transport profiles*

IEC 61588:2009, *Precision clock synchronization protocol for networked measurement and control systems*

IEC 61850-6:2009, *Communication networks and systems for power utility automation – Part 6: Configuration description language for communication in electrical substations related to IEDs*