

INTERNATIONAL STANDARD



Digital living network alliance (DLNA) home networked device interoperability
guidelines –
Part 7: Authentication **(standards.iteh.ai)**

[IEC 62481-7:2017](https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017)

<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017>



THIS PUBLICATION IS COPYRIGHT PROTECTED
Copyright © 2017 IEC, Geneva, Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either IEC or IEC's member National Committee in the country of the requester. If you have any questions about IEC copyright or have an enquiry about obtaining additional rights to this publication, please contact the address below or your local IEC member National Committee for further information.

IEC Central Office
3, rue de Varembe
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
Fax: +41 22 919 03 00
info@iec.ch
www.iec.ch

About the IEC

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications

The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigenda or an amendment might have been published.

IEC Catalogue - webstore.iec.ch/catalogue

The stand-alone application for consulting the entire bibliographical information on IEC International Standards, Technical Specifications, Technical Reports and other documents. Available for PC, Mac OS, Android Tablets and iPad.

Electropedia - www.electropedia.org

The world's leading online dictionary of electronic and electrical terms containing 20 000 terms and definitions in English and French, with equivalent terms in 16 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

IEC publications search - www.iec.ch/searchpub

The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee,...). It also gives information on projects, replaced and withdrawn publications.

IEC Glossary - std.iec.ch/glossary

65 000 electrotechnical terminology entries in English and French extracted from the Terms and Definitions clause of IEC publications issued since 2002. Some entries have been collected from earlier publications of IEC TC 37, 77, 86 and CISPR.

IEC Just Published - webstore.iec.ch/justpublished

Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and also once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc

If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: csc@iec.ch.

IEC STANDARD PREVIEW
(standards.iec.ch)
IEC 62481-1:2017
<https://standards.iec.ch/catalog/standards/sls/62481-1-2017>
655fddc39ef8/iec-62481-1-2017

INTERNATIONAL STANDARD



**Digital living network alliance (DLNA) home networked device interoperability
guidelines –
Part 7: Authentication**

STANDARD PREVIEW
(standards.iteh.ai)
IEC 62481-7:2017
<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017>

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

ICS 33.160; 35.100.05; 35.110

ISBN 978-2-8322-4630-6

Warning! Make sure that you obtained this publication from an authorized distributor.

CONTENTS

FOREWORD.....	3
INTRODUCTION.....	5
1 Scope.....	6
2 Normative references	6
3 Terms, definitions and conventions.....	7
3.1 General terms	7
3.2 Conventions.....	7
4 Networking architecture and guideline conventions.....	8
4.1 DLNA home networking architecture	8
4.2 Document conventions.....	8
4.3 Guideline structure.....	8
5 DLNA Device Model.....	8
5.1 General.....	8
5.2 Authentication Device Functions	8
5.3 Device Options	10
5.4 System usages	10
5.5 Theory of operation.....	10
6 Guideline requirements.....	11
6.1 Device discovery and control	11
6.1.1 Authentication Server discovery.....	11
6.1.2 Authentication Client discovery.....	11
6.2 Authentication guidelines.....	12
6.2.1 Authentication Server protocols	12
6.2.2 Authentication Client protocols	13
6.2.3 Client Authentication guidelines	14
6.2.4 Server Authentication guidelines.....	15
Figure 1 – Authentication functions	9

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME
NETWORKED DEVICE INTEROPERABILITY GUIDELINES –**
Part 7: Authentication
FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655f1dc39ef8/iec-62481-7-2017>
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62481-7 has been prepared under technical area 8: Multimedia home systems and applications for end-user network, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this International Standard is based on the following documents:

CDV	Report on voting
100/2744/CDV	100/2889/RVC

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

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

A list of all parts of IEC 62481 series, published under the general title *Digital Living Network Alliance (DLNA) home networked device interoperability guidelines*, can be found on the IEC website.

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

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

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

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

[IEC 62481-7:2017](https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017)

<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017>

INTRODUCTION

Consumers are acquiring, viewing, and managing an increasing amount of digital media (photos, music, and video) on devices in the consumer electronics (CE), mobile, and personal computer (PC) domains. As such, they want to conveniently enjoy the content, regardless of the source, across different devices and locations in the home. The digital home vision integrates the Internet, mobile, and broadcast networks through a seamless, interoperable network, which will provide a unique opportunity for manufacturers and consumers alike. In order to deliver on this vision, a common set of industry design guidelines is needed that allows vendors to participate in a growing marketplace, leading to more innovation, simplicity, and value for consumers. This document serves that purpose and provides vendors with the information needed to build interoperable networked platforms and devices for the digital home.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

[IEC 62481-7:2017](https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017)

<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017>

DIGITAL LIVING NETWORK ALLIANCE (DLNA) HOME NETWORKED DEVICE INTEROPERABILITY GUIDELINES –

Part 7: Authentication

1 Scope

This part of IEC 62481 specifies DLNA interoperability guidelines for device authentication.

The DLNA interoperability guidelines are based on a device authentication solution, which is defined as methods to enable authentication of a client device as DLNA Certified. Methods are included to allow a client device to authenticate a server device as trusted by a Certificate Authority.

The guidelines are intended to supplement other interoperability mechanisms already defined for DLNA link protection and DLNA DRM interoperability solutions.

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.

[IEC 62481-7:2017](#)

IEC 62481-1-1:2017, *Digital living network alliance (DLNA) home-networked device interoperability guidelines – Part 1: Architecture and protocols*

IETF RFC 2616, *Hypertext Transfer Protocol*,
<http://www.ietf.org/rfc/rfc2616.txt>

IETF RFC 2818, *HTTP over TLS, Informational*,
<http://tools.ietf.org/html/rfc2818>

IETF RFC 4680, *TLS Handshake Message for Supplemental Data*,
<http://tools.ietf.org/html/rfc4680>

IETF RFC 5246, *Transport Layer Security (TLS) Protocol*,
<http://tools.ietf.org/html/rfc5246>

IETF RFC 5280, *Internet X.509 Public Key Infrastructure Certificate and Certificate Revocation List (CRL) Profile*,
<http://tools.ietf.org/html/rfc5280>

IETF RFC 5878, *Transport Layer Security (TLS) Authorization Extensions*,
<http://tools.ietf.org/html/rfc5878>

IETF RFC 7562, *Authentication Credential Exchange Using TLS Supplemental Data*,
<https://tools.ietf.org/html/rfc7562>

DTCP Volume 1 (informational version), *Digital Transmission Content Protection Specification Volume 1, Revision 1.7*.
<http://www.dtcp.com/documents/dtcp/info-20111214-dtcp-v1-rev-1-p-7.pdf>

3 Terms, definitions and conventions

For the purposes of this document, the terms and definitions given in IEC 62481-1-1:2017 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 <http://www.iso.org/obp>

3.1 General terms

3.1.1

Authentication Client

set of device functions that, as part of the Client Authentication Device Option, provides the protocols to allow a client to be authenticated and the protocols to authenticate an Authentication Server by verifying the server credentials

3.1.2

Authentication Server

Device Function that, as part of the Server Authentication Device Option, provides the protocols to allow a server to be authenticated and the protocols to authenticate an Authentication Client by verifying the client credentials

3.1.3

Client Authentication

process or action where the Authentication Client initiates the authentication request for the Authentication Server to authenticate the Client

iTeh STANDARD PREVIEW
(standards.iteh.ai)
<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fddc39ef8/iec-62481-7-2017>

3.1.4

DTCP Method

process that occurs when a device uses a device certificate for itself during DLNA Authentication

3.1.5

Server Authentication

process or action where the Authentication Server is authenticated by the Authentication Client

3.1.6

X.509 Method

process that occurs when a device uses an X.509 credential for itself during DLNA Authentication

Note 1 to entry: No DTCP device certificate is used with this method.

3.2 Conventions

In IEC 62481-1-1:2017 and this document, a number of terms, conditions, mechanisms, sequences, parameters, events, states, or similar terms are printed with the first letter of each word in uppercase and the rest lowercase (e.g. Move.) Any lowercase uses of these words have the normal technical English meanings.

4 Networking architecture and guideline conventions

4.1 DLNA home networking architecture

This document extends the DLNA home networking architecture that is defined in Clause 4 of IEC 62481-1-1:2017.

4.2 Document conventions

See Clause 6 of IEC 62481-1-1:2017 for a description of the DLNA document conventions.

4.3 Guideline structure

See 7.1 of IEC 62481-1-1:2017 for guidelines and attribute table layout descriptions.

5 DLNA Device Model

5.1 General

Refer to Clause 5, IEC 62481-1-1:2017 for detailed descriptions of existing DLNA Home Networking Architecture Device Model. This document extends the existing DLNA system usages.

5.2 Authentication Device Functions

The architecture consists of system elements in the home and outside the home used to implement the DLNA authentication feature. These elements support both service provider and home owner use cases. Figure 1 is an overview of the architecture.

[IEC 62481-7:2017](https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017)

<https://standards.iteh.ai/catalog/standards/sist/22e258ca-44b6-428c-adee-655fd39ef8/iec-62481-7-2017>

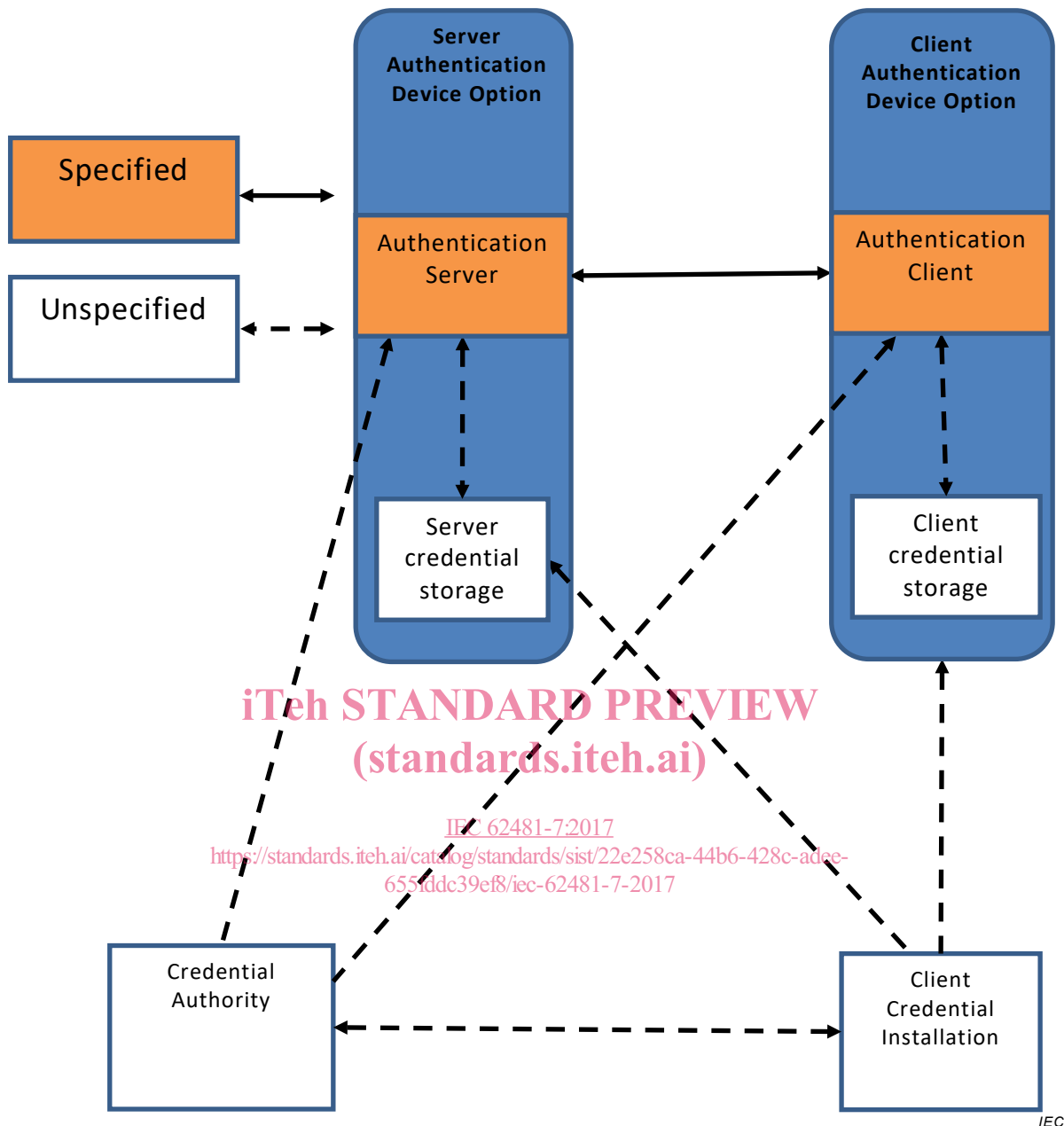


Figure 1 – Authentication functions

The architecture defines the following functions.

- Credential Authority: creates client and server credentials for use by manufacturers in their devices. Provides root certificate(s) to the Authentication Server and the Authentication Client. Defines the robustness requirements.
- Client Credential Installation: installs the credentials into the client device. Performed by the manufacturer.
- Client Credential Storage: stores the credentials according to the robustness requirements. Provides access to the credentials by the Authentication Server.
- Server Credential Storage: stores the credentials according to the robustness requirements. Provides access to the credentials by the Authentication Server.
- Authentication Client: authenticates with the Authentication Server and authenticates servers using the server credentials.
- Authentication Server: authenticates with the Authentication Client and authenticates clients using the client credentials.