

TECHNICAL SPECIFICATION

IEC
TS 62318

First edition
2003-06

**Multimedia systems and equipment –
Multimedia home server systems –
Home server conceptual model**



Reference number
IEC/TS 62318:2003(E)

Publication numbering

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Международная Электротехническая Комиссия

PRICE CODE

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA HOME SERVER SYSTEMS – HOME SERVER CONCEPTUAL MODEL

FOREWORD

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- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 62318, which is a technical specification, has been prepared by IEC technical committee 100: Audio, video and multimedia systems and equipment

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

Enquiry draft	Report on voting
100/575A/DTS	100/679/RVC

Full information on the voting for the approval of this technical specification 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.

The committee has decided that the contents of this publication will remain unchanged until 2006-03-31. At this date, the publication will be

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- withdrawn;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

A bilingual edition may be issued at a later date.

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INTRODUCTION

Broadcasters, network providers and consumer electronics companies have their own home server models, that are different from each other. In order to start a discussion on standardization of home server technology, a home server conceptual model should be established. The model should include all the server logical elements and the functionality, which is required and expected by broadcasters, network providers, consumer electronics companies and users.

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MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA HOME SERVER SYSTEMS – HOME SERVER CONCEPTUAL MODEL

1 Scope

This Technical Specification describes a home server conceptual model for multimedia home server systems. A home server conceptual model is specified from the standardization point of view to clarify the functionality and modularity of existing and future home servers.

The model provides key technology of home servers to be standardized. It should be noted that the modelling is not intended for actual implementation of home servers. The modelling is expected to be a reference for discussing and developing new works of home server standardization, and to contribute to ease of operation and connectivity of home servers.

The model is dealt with as an instance of the equipment structure model defined in IEC 61998.

2 Normative references

The following referenced documents are indispensable for the application 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 61998:1999, *Model and framework for standardization in multimedia equipment and systems*

3 Definitions

For the purposes of this document, the following definitions apply.

3.1

home server

interface between inhouse-networks and external communication environment, including mandatory high-capacity storage functionality and other optional functionality, as shown in Figure 1

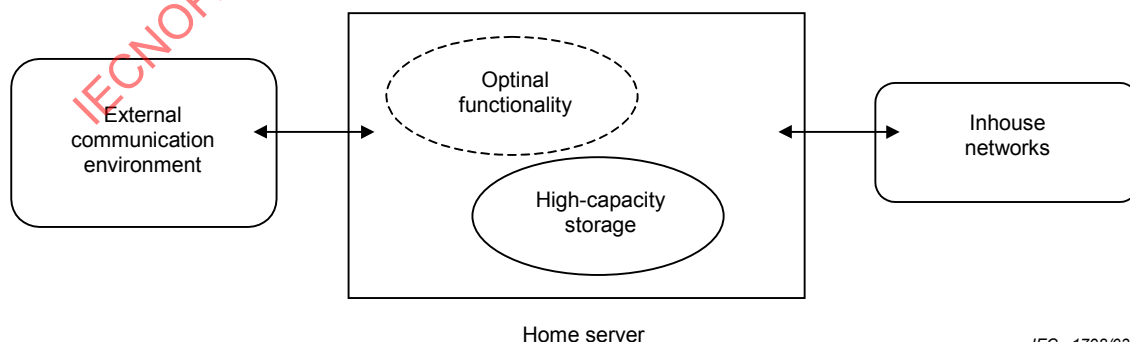


Figure 1 – Home server

3.2

interchangeable storage media

storage media for information interchange between systems

4 Notation

A Document Type Definition (DTD) of Extensible Markup Language (XML) is employed to precisely describe a logical structure of modelling.

NOTE Extensible Markup Language (XML) is a subset of Standard Generalized Markup Language (SGML) amended by its Technical Corrigendum 2.

5 Modelling syntax

```
<!-- This DTD shows a conceptual structure of home server consisting of its elements, by
using the content model. -->
<!-- invocation:
<!DOCTYPE conceptual model of home server PUBLIC "IEC 62318:1993//Conceptual
Model//EN">
-->
<!-- A conceptual model consists of its elements. Bottom subordinates are not specified.
-->
<!ELEMENT conceptual-home-server (head-end+, inhouse-network-interface+,
interchangeable-storage-media-port*, user-interface*, functional-module+,
application-program-interface*)>
<!ELEMENT head-end (satellite-head-end | terrestrial-head-end | cable-head-end |
powerline-head-end | internet-head-end | other-head-end)>
<!ELEMENT inhouse-network-interface (local-area-network-interface | home-bus-interface |
pc-interface | video-interface | other-inhouse-network-interface)>
<!ELEMENT interchangeable-storage-media-port
(nonsequential-media-port | sequential-media-port |
other-interchangeable-storage-media-port)>
<!ELEMENT user-interface (display-interface | sound-interface | operation-interface |
other-user-interface)>
<!ELEMENT functional-module (head-end-control-module |
inhouse-network-interface-control-module |
interchangeable-storage-media-port-control-module |
user-interface-control-module |
high-capacity-storage-control-module | content-control-module | user-assist-
module |
other-functional-module)>
<!ELEMENT application-program-interface (API-for-each-functional-module)>
<!-- See the semantics of each element in Clause 6. -->

<!-- NOTE
separator
, : all must occur, in the order shown
| : one and only one must occur
occurrence indicator
? : optional
+ : required and repeatable
* : optional and repeatable
-->
```

6 Modelling semantics

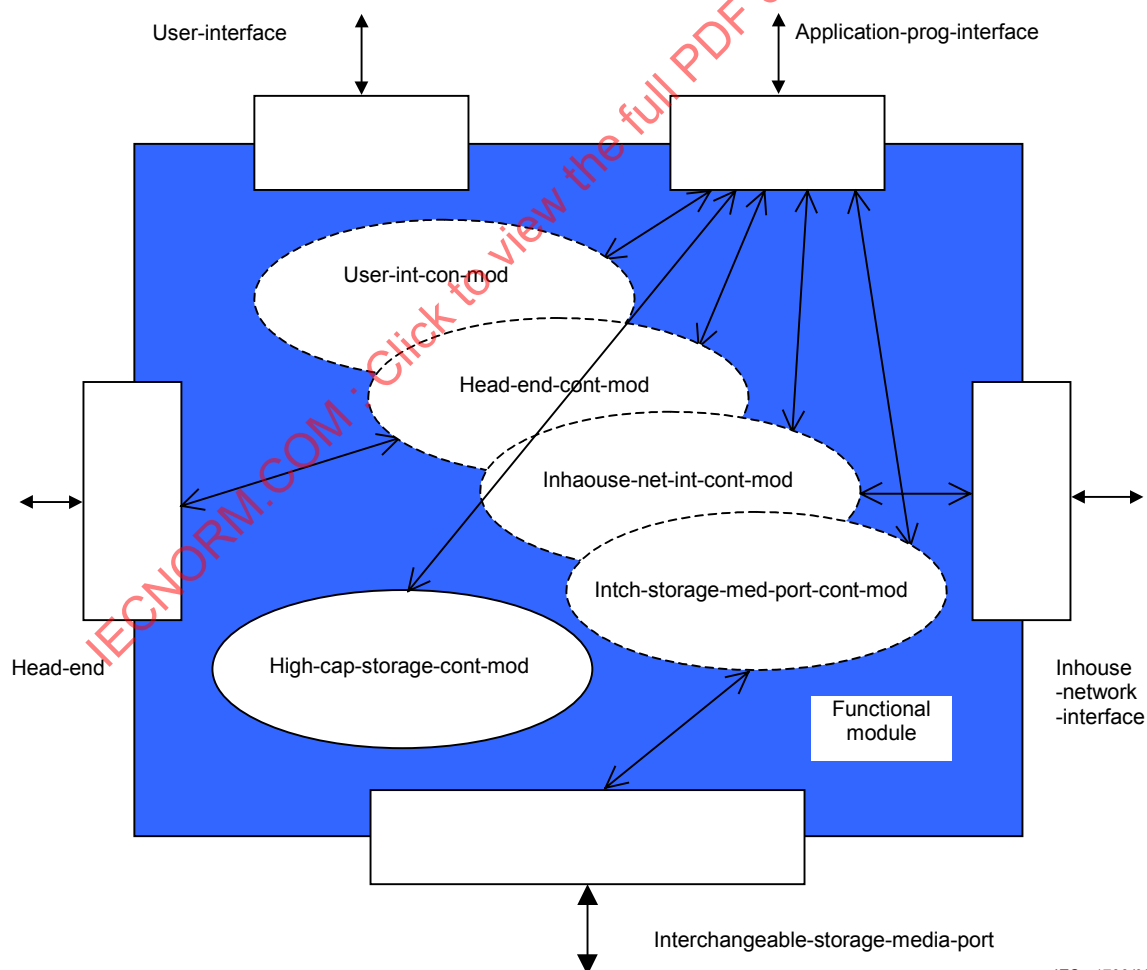
6.1 General

The basic elements of a home server are

- a) head-end,
- b) inhouse-network-interface,
- c) interchangeable-storage-media-port,
- d) user-interface,
- e) functional-module,
- f) application-program-interface.

A home server must contain at least one head-end element, one inhouse-network-interface element, and the functional-module element(s), which support those interfaces and high-capacity storage functionality. The home server may contain more than one of those elements and other elements.

Figure 2 shows an example of elements structure in the conceptual model.



IEC 1799/03

Figure 2 – Conceptual model consisting of elements

6.2 Head-end

Through a head-end element, a home server has access to an external network for information interchange, for example satellite, terrestrial, cable, powerline, internet, or other networking media. The element supports protocols for corresponding networking media.

6.3 Inhouse-network-interface

An inhouse-network-interface element interfaces with inhouse distributed equipment via local-area-network, home-bus, PC-interface, video-interface, or other interfacing media.

6.4 Interchangeable-storage-media-port

An interchangeable-storage-media-port element supports a logical functionality of information interchange via interchangeable storage media such as nonsequential-media (for example DVD) and sequential-media (for example Digital Video Tape).

6.5 User-interface

Through a user-interface element, all the communication between the home server and its user are carried out and home server operations are controlled by the user.

6.6 Functional module

All the functions and operations of head-end, inhouse network interface, interchangeable-storage-media-port and user-interface modules are controlled by the corresponding functional modules. In addition there are functional modules that control high-capacity storage, content data and user-assist functionalities: high-capacity storage control module, content control module and user-assist module. There may be other functional modules.

The content control module may consist of submodules, such as coding, decoding, content-managing, security-managing and content-editing submodules. The other functional modules may also be split up into submodules.

6.7 Application program interface

Some application programs can be installed into a home server. For feasible portability of the application programs, application program interfaces (APIs) are required. The API contains a module for each functional module.

7 Issues to be standardized

Functions and specifications of head-end and inhouse-network-interface elements will not be the issues of home server specific standards.

7.1 Interchangeable storage media port

Physical and logical formats of interchangeable storage media have been standardized by the responsible groups and volume/file services are provided by the standards. How to use the volume/file services should be standardized from the home server application's point of view.

7.2 User interface

Today's home servers for digital television, in particular, have many more functions than conventional home video recorders. Hence, the ever-growing need for clear user interfaces. To avoid user confusion, there should be some standardization for the user interfaces.

7.3 Functional module

Functions and their attributes provided by a functional module should be identified by a standardized scheme or naming convention. It needs to be intuitive to be of help when employing or comparing multiple different home servers (see the listing of functional module in Table A.1).

7.4 Application program interface

To achieve interoperability of application programs, the API of each functional module should be standardized.

NOTE 1 “Application Program Interface for UDF based File Systems” is an example standard on this issue. See IEC 62291.

NOTE 2 How to standardize API was discussed in JTC1 (see ISO/IEC JTC1 N2319).

7.5 Documentation

User manuals, service manuals and other documentation for home servers should be written with standardized names for the functions, their attributes and attribute values, for example

- a) name of function; subtitle overwrite;
- b) attributes/values:
 - character code/euc-jp,
 - position/bottom,
 - typeface/times-new-roman.

Such standardization enables users to understand the capabilities of their home server and avoid illegal user operations.