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# Information technology — MPEG systems technologies —

## Part 4: Codec configuration representation

*Technologies de l'information — Technologies des systèmes MPEG — Partie 4: Représentation de configuration codec*



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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# Foreword

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The committee responsible for this document is ISO/IEC JTC 1, *Information technology*, SC 29, *Coding of audio, picture, multimedia and hypermedia information*.

This third edition cancels and replaces the second edition (ISO/IEC 23001-4:2011), which has been technically revised.

ISO/IEC 23001 consists of the following parts, under the general title *Information technology — MPEG systems technologies*:

— *Part 1: Binary MPEG format for XML*

— *Part 2: Fragment request units*

— *Part 3: XML IPMP messages*

— *Part 4: Codec configuration representation*

— *Part 5: Bitstream Syntax Description Language (BSDL)*

— *Part 7: Common encryption in ISO base media file format files*

— *Part 8: Coding-independent code points*

— *Part 9: Common encryption of MPEG-2 transport streams*

# Introduction

This part of ISO/IEC 23001 defines the methods capable of describing codec configurations in the so-called reconfigurable video coding (RVC) framework. The objective of RVC is to offer a framework that is capable of configuring and specifying video codecs as a collection of “higher level” modules by using video coding tools. The video coding tools are defined in video tool library. Part 4 of ISO/IEC 23002 defines the MPEG video tool library. The RVC framework principle could also support non-MPEG tool libraries, provided that their developers have taken care to obey the appropriate rules of operation.

For the purpose of framework deployment, an appropriate description is needed to describe configurations of decoders composed of or instantiated from a subset of video tools from either one or more libraries. As illustrated in Figure 1, the configuration information consists of:

— bitstream syntax description, and

— network of functional units (FUs) description (also referred to as the decoder configuration)

that together constitute the entire decoder description (DD).

Bitstreams of existing MPEG standards are specified by specific syntax structures and decoders are composed of various coding tools. Therefore, RVC includes support for bitstream syntax descriptions as well as video coding tools. As depicted in Figure 1, a typical RVC decoder requires two types of information, namely the decoder description and the encoded media (e.g. video bitstreams) data.

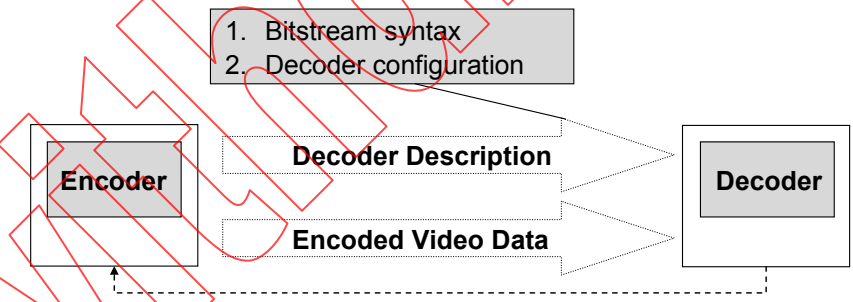


**Figure 1 — Conceptual diagram of RVC**

Figure 2 illustrates a more detailed description of the RVC decoder.

A more detailed description of the RVC decoder is shown in Figure 2. As shown in Figure 2, the decoder description is required for the configuration of a RVC decoder. The Bitstream Syntax Description (BSD) and FU Network Description (FND) (which compose the Decoder Description) are used to configure or compose an abstract decoder model (ADM) which is instantiated through the selection of FUs from tool libraries optionally with proper parameter assignment. Such an ADM constitutes the behavioral reference model used in setting up a decoding solution under the RVC framework. The process of yielding a decoding solution may vary depending on the technologies used for the desired implementations. Examples of the instantiation of an abstract decoder model and generation of proprietary decoding solutions are given in Annex I.

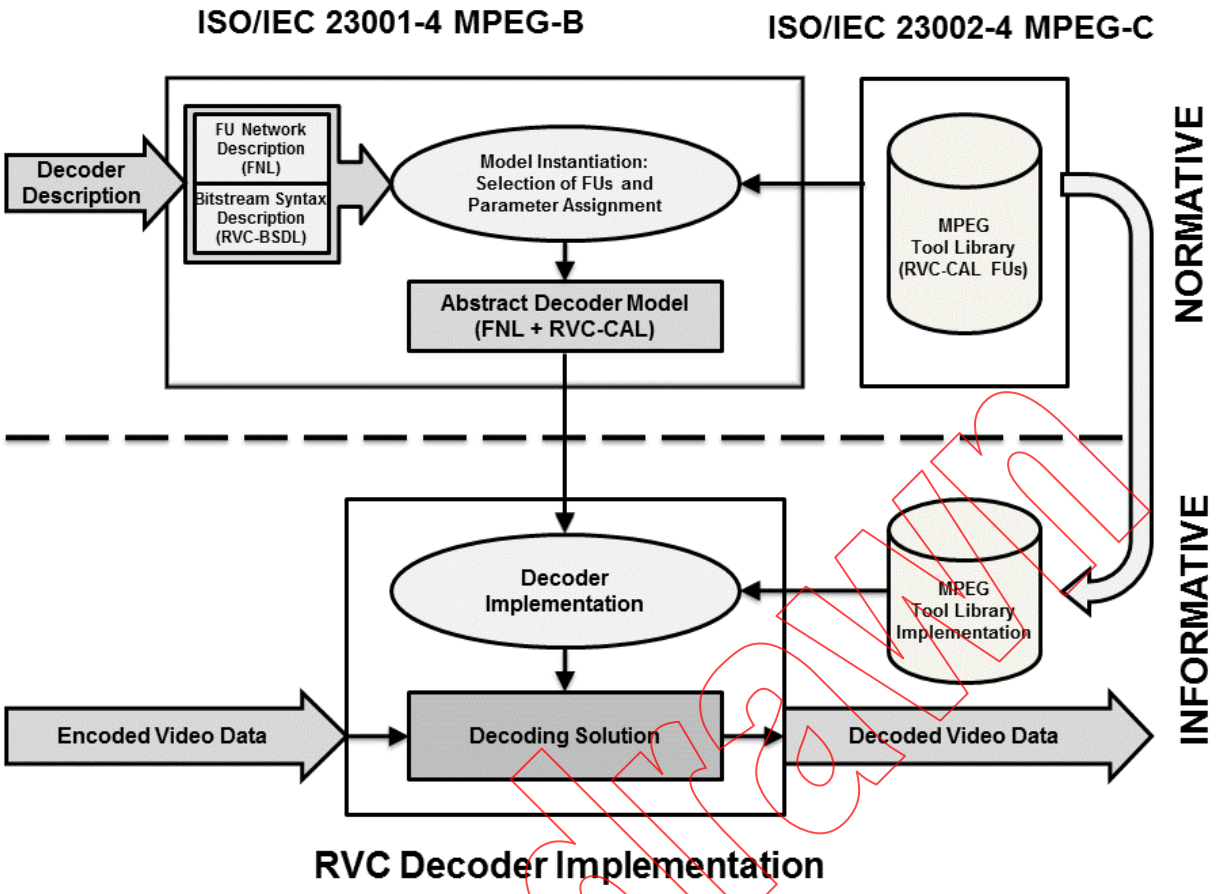


**Figure 2 — Graphical representation of the instantiation process or decoder composition mechanism for the RVC normative ADM and for the non-normative proprietary compliant decoder implementation**

Within the RVC framework, the decoder description describes a particular decoder configuration and consists of the FND and the BSD. The FND describes the connectivity of the network of FUs used to form a decoder whereas the parsing process for the bitstream syntax is implicitly described by the BSD. These two descriptions are specified using two standard XML-based languages or dialects:

— Functional Unit Network Language (FNL) is a language that describes the FND, known also as “network of FUs”. The FNL specified normatively within the scope of the RVC framework is provided in this part of ISO/IEC 23001;

— Bitstream Syntax Description Language (BSDL), standardized in ISO/IEC 23001-5 (MPEG-B Part 5), describes the bitstream syntax and the parsing rules. A pertinent subset of this BSDL named RVC-BSDL is defined within the scope of the current RVC framework. This RVC-BSDL also includes possibilities for further extensions, which are necessary to provide complete description of video bitstreams. RVC-BSDL specified normatively within the scope of the RVC framework is provided in this part of ISO/IEC 23001.

The decoder configuration specified using FNL, together with the specification of the bitstream syntax using RVC-BSDL fully specifies the ADM and provides an “executable” model of the RVC decoder description.

The instantiated ADM includes the information about the selected FUs and how they should be connected. As already mentioned, the FND with the network connection information is expressed by using FNL. Furthermore, the RVC framework specifies and uses a dataflow-oriented language called RVC-CAL for describing FUs' behavior. The normative specification of RVC-CAL is provided in this part of ISO/IEC 23001. The ADM is the behavioral model that should be referred to in order to implement any RVC conformant decoder. Any RVC compliant decoding solution/implementation can be achieved by using proprietary non-normative tools and mechanisms that yield decoders that behave equivalent to the RVC ADM.

The decoder description, the MPEG video tool library, and the associated instantiation of an ADM are normative. More precisely, the ADM is intended to be normative in terms of a behavioral model. In other words what is normative is the input/output behavior of the complete ADM as well as the input/output behavior of all the FUs that are included in the ADM.

# Information technology — MPEG systems technologies —

# Part 4:
# Codec configuration representation



## 1 Scope

This part of ISO/IEC 23001 defines the methods and general principles capable of describing codec configurations in the so-called reconfigurable video coding (RVC) framework. It primarily addresses reconfigurable video aspects and will only focus on the description of representation for video codec configurations within the RVC framework.

Within the scope of the RVC framework, two languages, namely FNL and RVC-BSDL, are specified normatively. FNL is a language that describes the FND, also known as “network of FUs”. RVC-BSDL is a pertinent subset of BSDL defined in ISO/IEC 23001-5. This RVC-BSDL also includes possibilities for further extensions, which are necessary to provide complete description of video bitstreams.

## 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.

ISO/IEC 14496-2:2004, *Information technology — Coding of audio-visual objects — Part 2: Visual*

ISO/IEC 14496-12, *Information technology– Coding of audio-visual objects – Part 12: ISO base media file format*

ISO/IEC 23001-5:2008, *Information technology — MPEG systems technologies — Part 5: Bitstream Syntax Description Language (BSDL)*

ISO/IEC 23002-4, *Information technology — MPEG video technologies — Part 4: Video tool library*

*DEFLATE Compressed Data Format Specification version 1.3*, P. Deutsch, The Internet Society, May 1996

IETF RFC 1889, *RTP A Transport Protocol for Real-Time Applications*, H. Schulzrinne, et. al., January 1996

IETF RFC 2327, *SDP: Session Description Protocol*, M. Handley, April 1998