

INTERNATIONAL STANDARD

ISO/IEC
8632-1

Second edition
1992-10-01

**Information technology — Computer graphics —
Metafile for the storage and transfer of picture
description information —
Part 1:
Functional specification**

iTeh STANDARD PREVIEW
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ISO/IEC 8632-1:1992

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Technologies de l'information — Infographie — Métafichier de stockage
et de transfert des informations de description d'images —

Partie 1: Description fonctionnelle



Reference number
ISO/IEC 8632-1:1992(E)

CONTENTS

| | | |
|-------|------------------------------------|----|
| 1 | Scope | 1 |
| 2 | Normative references | 2 |
| 3 | Definitions and abbreviations | 4 |
| 3.1 | Definitions | 4 |
| 3.2 | Abbreviations | 9 |
| 4 | Concepts | 10 |
| 4.1 | Introduction | 10 |
| 4.2 | Delimiter elements | 10 |
| 4.3 | Metafile descriptor elements | 11 |
| 4.3.1 | Identification | 12 |
| 4.3.2 | Functional capability | 12 |
| 4.3.3 | Default metafile state | 16 |
| 4.3.4 | Fonts and character sets | 16 |
| 4.4 | Picture descriptor elements | 21 |
| 4.4.1 | Scaling mode | 21 |
| 4.4.2 | Colour selection mode | 21 |
| 4.4.3 | Specification modes | 21 |
| 4.4.4 | VDC extent | 22 |
| 4.4.5 | CGM tailoring | 22 |
| 4.4.6 | Background colour | 24 |
| 4.4.7 | Device viewport control | 24 |
| 4.4.8 | Representations | 25 |
| 4.4.9 | Definable attributes | 25 |
| 4.5 | Control elements | 25 |
| 4.5.1 | VDC space and range | 25 |
| 4.5.2 | Clipping | 25 |
| 4.5.3 | Save and restore primitive context | 27 |
| 4.5.4 | Compound clipping and shielding | 27 |
| 4.5.5 | Generalized text path | 30 |
| 4.5.6 | Mitre limit | 30 |
| 4.5.7 | Transparent cell colour | 30 |

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| | | |
|--------|---|-----|
| 4.6 | Graphical primitive elements | 31 |
| 4.6.1 | Line elements | 33 |
| 4.6.2 | Marker element | 35 |
| 4.6.3 | Text elements | 36 |
| 4.6.4 | Filled-area elements | 36 |
| 4.6.5 | Cell elements | 38 |
| 4.6.6 | Circular arc elements | 41 |
| 4.6.7 | Elliptical elements | 41 |
| 4.6.8 | Hyperbolic Arc Element | 42 |
| 4.6.9 | Parabolic arc element | 42 |
| 4.6.10 | Spline curve elements | 46 |
| 4.6.11 | Closed figures | 48 |
| 4.6.12 | Symbol elements | 54 |
| 4.7 | Attribute elements | 55 |
| 4.7.1 | Line attributes | 58 |
| 4.7.2 | Marker attributes | 59 |
| 4.7.3 | Text attributes | 61 |
| 4.7.4 | Filled-area attributes | 85 |
| 4.7.5 | Specification modes and transformation of aspects | 87 |
| 4.7.6 | Colour attributes | 88 |
| 4.7.7 | Pick identifier | 90 |
| 4.7.8 | Compound text path | 90 |
| 4.7.9 | Symbol Attributes | 91 |
| 4.8 | Escape elements | 93 |
| 4.9 | External elements | 93 |
| 4.10 | Segment elements | 93 |
| 4.10.1 | Introduction | 93 |
| 4.10.2 | Local and global segments | 94 |
| 4.10.3 | Delimiting and naming segments | 95 |
| 4.10.4 | Segment attributes | 95 |
| 4.10.5 | Copy segment and inheritance | 96 |
| 4.11 | Metafile states | 101 |
| 4.12 | Registration | 112 |
| 5 | Abstract specification of elements | 115 |
| 5.1 | Introduction | 115 |
| 5.2 | Delimiter elements | 119 |
| 5.2.1 | BEGIN METAFILE | 119 |
| 5.2.2 | END METAFILE | 119 |
| 5.2.3 | BEGIN PICTURE | 119 |
| 5.2.4 | BEGIN PICTURE BODY | 120 |
| 5.2.5 | END PICTURE | 121 |
| 5.2.6 | BEGIN SEGMENT | 121 |
| 5.2.7 | END SEGMENT | 121 |
| 5.2.8 | BEGIN FIGURE | 122 |
| 5.2.9 | END FIGURE | 122 |
| 5.2.10 | BEGIN PROTECTION REGION | 122 |
| 5.2.11 | END PROTECTION REGION | 123 |
| 5.2.12 | BEGIN COMPOUND LINE | 123 |
| 5.2.13 | END COMPOUND LINE | 123 |
| 5.2.14 | BEGIN COMPOUND TEXT PATH | 124 |
| 5.2.15 | END COMPOUND TEXT PATH | 124 |
| 5.2.16 | BEGIN TILE ARRAY | 124 |
| 5.2.17 | END TILE ARRAY | 125 |

| | | |
|--------|--|-----|
| 5.3 | Metafile descriptor elements | 127 |
| 5.3.1 | METAFILE VERSION | 127 |
| 5.3.2 | METAFILE DESCRIPTION | 127 |
| 5.3.3 | VDC TYPE | 127 |
| 5.3.4 | INTEGER PRECISION | 128 |
| 5.3.5 | REAL PRECISION | 128 |
| 5.3.6 | INDEX PRECISION | 128 |
| 5.3.7 | COLOUR PRECISION | 128 |
| 5.3.8 | COLOUR INDEX PRECISION | 129 |
| 5.3.9 | MAXIMUM COLOUR INDEX | 129 |
| 5.3.10 | COLOUR VALUE EXTENT | 129 |
| 5.3.11 | METAFILE ELEMENT LIST | 130 |
| 5.3.12 | METAFILE DEFAULTS REPLACEMENT | 131 |
| 5.3.13 | FONT LIST | 132 |
| 5.3.14 | CHARACTER SET LIST | 132 |
| 5.3.15 | CHARACTER CODING ANNOUNCER | 133 |
| 5.3.16 | NAME PRECISION | 134 |
| 5.3.17 | MAXIMUM VDC EXTENT | 134 |
| 5.3.18 | SEGMENT PRIORITY EXTENT | 134 |
| 5.3.19 | COLOUR MODEL | 135 |
| 5.3.20 | COLOUR CALIBRATION | 135 |
| 5.3.21 | FONT PROPERTIES | 137 |
| 5.3.22 | GLYPH MAPPING | 141 |
| 5.3.23 | SYMBOL LIBRARY LIST | 142 |
| 5.4 | Picture descriptor elements | 143 |
| 5.4.1 | SCALING MODE | 143 |
| 5.4.2 | COLOUR SELECTION MODE | 143 |
| 5.4.3 | LINE WIDTH SPECIFICATION MODE | 144 |
| 5.4.4 | MARKER SIZE SPECIFICATION MODE | 144 |
| 5.4.5 | EDGE WIDTH SPECIFICATION MODE | 145 |
| 5.4.6 | VDC EXTENT | 145 |
| 5.4.7 | BACKGROUND COLOUR | 146 |
| 5.4.8 | DEVICE VIEWPORT | 146 |
| 5.4.9 | DEVICE VIEWPORT SPECIFICATION MODE | 147 |
| 5.4.10 | DEVICE VIEWPORT MAPPING | 147 |
| 5.4.11 | LINE REPRESENTATION | 148 |
| 5.4.12 | MARKER REPRESENTATION | 148 |
| 5.4.13 | TEXT REPRESENTATION | 149 |
| 5.4.14 | FILL REPRESENTATION | 150 |
| 5.4.15 | EDGE REPRESENTATION | 150 |
| 5.4.16 | INTERIOR STYLE SPECIFICATION MODE | 151 |
| 5.4.17 | LINE AND EDGE TYPE DEFINITION | 151 |
| 5.4.18 | HATCH STYLE DEFINITION | 152 |
| 5.4.19 | GEOMETRIC PATTERN DEFINITION | 153 |
| 5.5 | Control elements | 155 |
| 5.5.1 | VDC INTEGER PRECISION | 155 |
| 5.5.2 | VDC REAL PRECISION | 155 |
| 5.5.3 | AUXILIARY COLOUR | 155 |
| 5.5.4 | TRANSPARENCY | 156 |
| 5.5.5 | CLIP RECTANGLE | 157 |
| 5.5.6 | CLIP INDICATOR | 157 |
| 5.5.7 | LINE CLIPPING MODE | 157 |
| 5.5.8 | MARKER CLIPPING MODE | 158 |

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ISO/IEC 8632-1:1992

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| | | |
|--------|-------------------------------------|-----|
| 5.5.9 | EDGE CLIPPING MODE | 158 |
| 5.5.10 | NEW REGION | 158 |
| 5.5.11 | SAVE PRIMITIVE CONTEXT | 159 |
| 5.5.12 | RESTORE PRIMITIVE CONTEXT | 160 |
| 5.5.13 | PROTECTION REGION INDICATOR | 160 |
| 5.5.14 | GENERALIZED TEXT PATH MODE | 161 |
| 5.5.15 | MITRE LIMIT | 161 |
| 5.5.16 | TRANSPARENT CELL COLOUR | 161 |
| 5.6 | Graphical primitive elements | 163 |
| 5.6.1 | POLYLINE | 163 |
| 5.6.2 | DISJOINT POLYLINE | 163 |
| 5.6.3 | POLYMARKER | 163 |
| 5.6.4 | TEXT | 164 |
| 5.6.5 | RESTRICTED TEXT | 165 |
| 5.6.6 | APPEND TEXT | 166 |
| 5.6.7 | POLYGON | 167 |
| 5.6.8 | POLYGON SET | 168 |
| 5.6.9 | CELL ARRAY | 171 |
| 5.6.10 | GENERALIZED DRAWING PRIMITIVE (GDP) | 173 |
| 5.6.11 | RECTANGLE | 173 |
| 5.6.12 | CIRCLE | 174 |
| 5.6.13 | CIRCULAR ARC 3 POINT | 174 |
| 5.6.14 | CIRCULAR ARC 3 POINT CLOSE | 175 |
| 5.6.15 | CIRCULAR ARC CENTRE | 177 |
| 5.6.16 | CIRCULAR ARC CENTRE CLOSE | 177 |
| 5.6.17 | ELLIPSE | 178 |
| 5.6.18 | ELLIPTICAL ARC | 179 |
| 5.6.19 | ELLIPTICAL ARC CLOSE | 180 |
| 5.6.20 | CIRCULAR ARC CENTRE REVERSED | 181 |
| 5.6.21 | CONNECTING EDGE | 181 |
| 5.6.22 | HYPERBOLIC ARC | 182 |
| 5.6.23 | PARABOLIC ARC | 182 |
| 5.6.24 | NON-UNIFORM B-SPLINE | 183 |
| 5.6.25 | NON-UNIFORM RATIONAL B-SPLINE | 183 |
| 5.6.26 | POLYBEZIER | 184 |
| 5.6.27 | POLYSYMBOL | 185 |
| 5.6.28 | BITONAL TILE | 185 |
| 5.6.29 | TILE | 187 |
| 5.7 | Attribute elements | 190 |
| 5.7.1 | LINE BUNDLE INDEX | 190 |
| 5.7.2 | LINE TYPE | 190 |
| 5.7.3 | LINE WIDTH | 191 |
| 5.7.4 | LINE COLOUR | 192 |
| 5.7.5 | MARKER BUNDLE INDEX | 192 |
| 5.7.6 | MARKER TYPE | 192 |
| 5.7.7 | MARKER SIZE | 193 |
| 5.7.8 | MARKER COLOUR | 194 |
| 5.7.9 | TEXT BUNDLE INDEX | 194 |
| 5.7.10 | TEXT FONT INDEX | 195 |
| 5.7.11 | TEXT PRECISION | 195 |
| 5.7.12 | CHARACTER EXPANSION FACTOR | 196 |
| 5.7.13 | CHARACTER SPACING | 196 |
| 5.7.14 | TEXT COLOUR | 197 |

| | | |
|--------|-------------------------------|-----|
| 5.7.15 | CHARACTER HEIGHT | 197 |
| 5.7.16 | CHARACTER ORIENTATION | 198 |
| 5.7.17 | TEXT PATH | 199 |
| 5.7.18 | TEXT ALIGNMENT | 199 |
| 5.7.19 | CHARACTER SET INDEX | 200 |
| 5.7.20 | ALTERNATE CHARACTER SET INDEX | 200 |
| 5.7.21 | FILL BUNDLE INDEX | 201 |
| 5.7.22 | INTERIOR STYLE | 201 |
| 5.7.23 | FILL COLOUR | 202 |
| 5.7.24 | HATCH INDEX | 202 |
| 5.7.25 | PATTERN INDEX | 203 |
| 5.7.26 | EDGE BUNDLE INDEX | 204 |
| 5.7.27 | EDGE TYPE | 204 |
| 5.7.28 | EDGE WIDTH | 205 |
| 5.7.29 | EDGE COLOUR | 205 |
| 5.7.30 | EDGE VISIBILITY | 206 |
| 5.7.31 | FILL REFERENCE POINT | 206 |
| 5.7.32 | PATTERN TABLE | 207 |
| 5.7.33 | PATTERN SIZE | 207 |
| 5.7.34 | COLOUR TABLE | 208 |
| 5.7.35 | ASPECT SOURCE FLAGS | 209 |
| 5.7.36 | PICK IDENTIFIER | 210 |
| 5.7.37 | LINE CAP | 210 |
| 5.7.38 | LINE JOIN | 211 |
| 5.7.39 | LINE TYPE CONTINUATION | 211 |
| 5.7.40 | LINE TYPE INITIAL OFFSET | 212 |
| 5.7.41 | TEXT SCORE TYPE | 212 |
| 5.7.42 | RESTRICTED TEXT TYPE | 213 |
| 5.7.43 | INTERPOLATED INTERIOR | 214 |
| 5.7.44 | EDGE CAP | 215 |
| 5.7.45 | EDGE JOIN | 216 |
| 5.7.46 | EDGE TYPE CONTINUATION | 216 |
| 5.7.47 | EDGE TYPE INITIAL OFFSET | 217 |
| 5.7.48 | SYMBOL LIBRARY INDEX | 217 |
| 5.7.49 | SYMBOL COLOUR | 218 |
| 5.7.50 | SYMBOL SIZE | 218 |
| 5.7.51 | SYMBOL ORIENTATION | 219 |
| 5.8 | Escape elements | 220 |
| 5.8.1 | ESCAPE | 220 |
| 5.9 | External elements | 221 |
| 5.9.1 | MESSAGE | 221 |
| 5.9.2 | APPLICATION DATA | 221 |
| 5.10 | Segment elements | 222 |
| 5.10.1 | COPY SEGMENT | 222 |
| 5.10.2 | INHERITANCE FILTER | 222 |
| 5.10.3 | CLIP INHERITANCE | 224 |
| 5.10.4 | SEGMENT TRANSFORMATION | 224 |
| 5.10.5 | SEGMENT HIGHLIGHTING | 224 |
| 5.10.6 | SEGMENT DISPLAY PRIORITY | 225 |
| 5.10.7 | SEGMENT PICK PRIORITY | 225 |
| 6 | Metafile defaults | 227 |

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| | | |
|--------|---|-----|
| 7 | Conformance | 232 |
| 7.1 | Forms of conformance | 232 |
| 7.2 | Functional conformance of metafiles | 232 |
| 7.3 | Full conformance of metafiles | 232 |
| 7.4 | Conformance of other encodings | 232 |
| A | Formal grammar of the functional specification of version 1 metafiles | 233 |
| A.1 | Introduction | 233 |
| A.2 | Notation used | 233 |
| A.3 | Detailed grammar | 233 |
| A.3.1 | Metafile structure | 233 |
| A.3.2 | Metafile descriptor elements | 234 |
| A.3.3 | Picture descriptor elements | 236 |
| A.3.4 | Control elements | 236 |
| A.3.5 | Graphical elements | 237 |
| A.3.6 | Attribute elements | 240 |
| A.3.7 | Escape elements | 243 |
| A.3.8 | External elements | 243 |
| A.4 | Terminal symbols | 244 |
| B | Formal Grammar of the functional specification of version 2 metafiles | 248 |
| B.1 | Introduction | 248 |
| B.2 | Notation used | 248 |
| B.3 | Detailed grammar | 248 |
| B.3.1 | Metafile structure | 248 |
| B.3.2 | Metafile descriptor elements | 249 |
| B.3.3 | Picture descriptor elements | 252 |
| B.3.4 | Control elements | 254 |
| B.3.5 | Graphical elements | 255 |
| B.3.6 | Attribute elements | 257 |
| B.3.7 | Closed figure element | 261 |
| B.3.8 | Escape elements | 261 |
| B.3.9 | External elements | 262 |
| B.3.10 | Segment elements | 262 |
| B.4 | Terminal symbols | 264 |
| C | Formal grammar of the functional specification of version 3 metafiles | 272 |
| C.1 | Introduction | 272 |
| C.2 | Definitions | 272 |
| C.2.1 | Notation Used | 272 |
| C.2.2 | Structured Data Records: | 272 |
| C.3 | Detailed Grammar | 273 |
| C.3.1 | Metafile structure | 273 |
| C.3.2 | Metafile descriptor elements | 278 |
| C.3.3 | Picture descriptor elements | 281 |
| C.3.4 | Control elements | 285 |
| C.3.5 | Graphical elements | 286 |
| C.3.6 | Attribute elements | 289 |
| C.3.7 | Escape elements | 294 |
| C.3.8 | External elements | 294 |
| C.3.9 | Segment elements | 294 |
| C.4 | Terminal symbols | 297 |
| D | Guidelines for metafile generators and interpreters | 307 |
| D.1 | Introduction | 307 |

| | | |
|-------|--|-----|
| D.2 | Errors and degeneracies | 307 |
| D.2.1 | Syntax errors | 308 |
| D.2.2 | Geometrically degenerate primitives | 308 |
| D.2.3 | Mathematical singularities and ambiguities | 309 |
| D.3 | General guidelines | 309 |
| D.3.1 | Indexes | 309 |
| D.3.2 | Colour model | 309 |
| D.3.3 | Order of metafile descriptor elements | 312 |
| D.3.4 | Unsatisfied references | 312 |
| D.4 | Guidelines for element classes | 312 |
| D.4.1 | Delimiter elements | 312 |
| D.4.2 | Metafile descriptor elements | 312 |
| D.4.3 | Picture descriptor elements | 312 |
| D.4.4 | Control elements | 313 |
| D.4.5 | Graphical primitive elements | 313 |
| D.4.6 | Attribute elements | 316 |
| D.4.7 | Escape elements | 318 |
| D.4.8 | External elements | 318 |
| D.4.9 | Segment elements | 318 |
| E | Guidelines for private encodings | 320 |
| F | Reference models | 321 |
| G | Conversions between the CIEXYZ reference colour space and metafile colour spaces | 325 |
| G.1 | Introduction | 325 |
| G.2 | Definitions | 325 |
| G.3 | CIELUV | 325 |
| G.3.1 | Conversion from the CIEXYZ reference colour space to CIELUV | 325 |
| G.3.2 | Conversion from CIELUV to the CIEXYZ reference colour space | 326 |
| G.4 | CIELAB | 327 |
| G.4.1 | Conversion from the CIEXYZ reference colour space to CIELAB | 327 |
| G.4.2 | Conversion from CIELAB to the CIEXYZ reference colour space | 328 |
| G.5 | RGB | 329 |
| G.5.1 | Conversion from the CIEXYZ reference colour space to RGB | 329 |
| G.5.2 | Conversion from RGB to the CIEXYZ reference colour space | 330 |
| G.6 | RGB-related | 331 |
| G.7 | CMYK | 331 |
| G.7.1 | Conversion from CMYK to the CIEXYZ reference colour space | 331 |
| G.7.2 | CMYK Calibration data | 331 |
| G.8 | Bibliography | 332 |

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 8632-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*. **iTeh STANDARD PREVIEW**
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This second edition cancels and replaces the first edition (ISO 8632-1:1987), which has been technically revised. [ISO/IEC 8632-1:1992](https://standards.iteh.ai/catalog/standards/sist/6a30859d-756b-4d4b-b9c9-7f7777777777/iso-iec-8632-1-1992)

ISO/IEC 8632 consists of the following parts, under the general title *Information technology – Computer graphics – Metafile for the storage and transfer of picture description information* :

Part 1: Functional specification

Part 2: Character encoding

Part 3: Binary encoding

Part 4: Clear text encoding

Annexes A, B, and C form an integral part of this part of ISO/IEC 8632. Annexes D, E, F and G are for information only

Introduction

0.1 Purpose

The Computer Graphics Metafile provides a file format suitable for the storage and retrieval of picture information. The file format consists of a set of elements that can be used to describe pictures in a way that is compatible between systems of different architectures and devices of differing capabilities and design. This picture description includes the capability for describing static pictures. Static pictures are those where elements which may lead to dynamic effects (for example those leading to regeneration) are prohibited within the picture body.

0.2 Reasons for this International Standard

The main reasons for producing a standard computer graphics metafile are

- a) to allow picture information to be stored in an organized way on a graphical software system;
- b) to facilitate transfer of picture information between different graphical software systems;
- c) to enable picture information to be transferred between graphical devices;
- d) to enable picture information to be transferred between different computer graphics installations.

0.3 Design requirements

To reach these objectives, a number of design principles were adopted:

- a) The metafile should provide a suitable set of elements for the transfer of a wide range of pictorial information.
- b) The metafile should address the more usual and essential features found on graphical devices directly and should provide access to less common facilities via an escape mechanism.
- c) The design of the metafile should not preclude extension of ISO/IEC 8632 at a later stage to cover facilities beyond those included in this version of the Standard. It should also not preclude further extensions to support future standards.
- d) The metafile should be usable from GKS (Graphical Kernel System — ISO 7942) with both metafile input and metafile output functions. It should include the capability to support ISO 7942 (GKS) static picture capture.

Design requirements**Introduction**

- e) ISO/IEC 8632 should address the needs of different applications that have conflicting requirements for size of metafile, speed of generation and interpretation, readability, editability and ease of transfer through different transport mechanisms.

0.4 Design criteria

The requirements of 0.3 were used to formulate the following criteria which were used to decide between different design possibilities.

- a) **Completeness:** In any area of ISO/IEC 8632, the functionality specified by ISO/IEC 8632 should be complete in itself.
- b) **Conciseness:** Redundant elements or parameters should be avoided.
- c) **Consistency:** Contradictory elements should be avoided.
- d) **Extensibility:** The ability to add new elements and generality to ISO/IEC 8632 should not be precluded.
- e) **Fidelity:** The minimal results and characteristics of elements should be well defined.
- f) **Implementability:** An element should be able to be supported efficiently on most host systems and/or graphics hardware.
- g) **Orthogonality:** The elements of the metafile should be independent of each other, or any dependencies should be structured and well defined.
- h) **Predictability:** ISO/IEC 8632 should be such that the recommended or proper use of standard elements guarantees the results of using a particular element.
- i) **Standard practice:** Only those elements that reflect existing practice, that are necessary to support existing practice, or that are necessary to support proposed standards should be standardized.
- j) **Usefulness:** Functions should be powerful enough to perform useful tasks.
- k) **Well-structured:** The assumptions that elements make about each other should be minimized. An element should have a well-defined interface and a simply stated unconditional purpose. Multipurpose elements and side effects should be avoided.

0.5 Access to a metafile

The metafile has been designed so that, although its main usage is anticipated as being with completely sequential access, non-sequential access is also possible. Once the basic environment of the metafile has been established, individual pictures may be accessible if the medium, the encoding and the implementation support this form of access.

0.6 Generation and interpretation of metafiles

The specific mechanisms of metafile generation and interpretation are not described by ISO/IEC 8632, although it does describe the intended result of such interpretation. The basic set of metafile elements includes a capability for the addition of application-dependent data, which do not have graphical meaning and for which no intended interpretation results are described.

0.7 Distinction between formal specification and encodings

The functionality provided by the metafile is separated from the specification of any particular encoding format. ISO/IEC 8632 provides for both standard and private encodings of the elements described in this

Introduction

Distinction between formal specification and encodings

part of ISO/IEC 8632. Guidelines for private encodings are specified in annex E; these guidelines do not form part of ISO/IEC 8632.

Three standard encodings are specified in parts 2, 3 and 4 of ISO/IEC 8632. Each of the standardized encodings is capable of representing the full functionality described in this part of ISO/IEC 8632. Translation between the standardized encodings is possible without loss of picture information, although subsequent translation back into the original encoding may not result in precisely the same data stream, due to different quantizations of precisions in the different encodings.

The character encoding specified in ISO/IEC 8632-2 is intended to provide an encoding of minimum size. It conforms to the rules for code extension specified in ISO 2022 in the category of complete code system. It is particularly suitable for transfer through networks that cannot support binary transfers.

The binary encoding specified in ISO/IEC 8632-3 provides an encoding that requires least effort to generate and interpret on many systems.

The clear text encoding specified in ISO/IEC 8632-4 provides an encoding that can be created, viewed and edited with standard text editors. It is therefore also suitable for transfer through networks that support only transfer of text files.

0.8 Relationship to other International Standards

ISO/IEC 8632 draws extensively for its model of a graphics system on GKS (Graphical Kernel System — ISO 7942). In addition, ISO/IEC 8632 specifies a metafile that may be used as a static picture-capture metafile by GKS.

This part of ISO/IEC 8632 uses font concepts and the font architecture defined in ISO/IEC 9541-1 for defining CGM references to fonts and font resources. The font properties of ISO/IEC 9541-1 are adopted, where appropriate, to define CGM mechanisms to provide information useful for font substitution between parties interchanging Metafiles. This part of ISO/IEC 8632 includes the minimum font description subset defined in ISO/IEC 9541-2. Clause 3 contains a number of glossary definitions that are taken from, and are identical to, those found in ISO/IEC 9541-1. This part of ISO/IEC 8632 also defines access to extended families of glyph based on the principles and procedures of ISO/IEC 10036.

This part of ISO/IEC 8632 uses a colorimetrically precise reference colour space to allow for interchange of precise colour specifications. It uses concepts defined in ISO/IEC 8613/Amd.2 which are based on CIE publications. ISO/IEC 8613/Amd.2 provides tutorial material on relevant definitions and colour concepts, which is useful for understanding the material in this Standard but is not incorporated into this Standard in that amount of detail.

The character encoding specified in ISO/IEC 8632-2 conforms to the code extension techniques of ISO 2022.

The binary encoding specified in ISO/IEC 8632-3 employs the mechanism for representing floating point numbers specified in ANSI/IEEE 754-1986.

For certain elements, the CGM defines value ranges of parameters as being reserved for registration. The meanings of these values will be defined using the established procedures (see 4.12) of the ISO International Registration Authority for Graphical Items. These procedures do not apply to values and value ranges defined as being reserved for private use; these values and ranges are not standardized. There is a very close relationship between many of the elements in ISO 8632 and a subset of the functions in the CGI (Computer Graphics Interface — ISO/IEC 9636).

0.9 Versions

ISO/IEC 8632 defines several versions of the Computer Graphics Metafile. A version is defined by a formal grammar and additional specifications contained in clauses 4, 5, and 6. Clause 7 contains conformance criteria defined by version.

These versions are currently defined: Version 1 (one); Version 2 (two); and Version 3 (three).

NOTES

1 A valid Version 2 metafile is also a valid Version 3 metafile. A valid Version 1 metafile is also a valid Version 2 metafile.

2 Version 1 metafiles are as defined by the original CGM standard, which was designated ISO 8632:1987. Version 2 metafiles are as defined by the first amendment to the CGM standard, which was designated ISO 8632:1987/Amd.1:1990. Version 3 metafiles are as defined by an amendment to Version 2 of the CGM standard. This amendment was originally designated ISO/IEC 8632:1987/Amd.3:1991, but was never published as an amendment. Instead all documents were consolidated to produce this revision of ISO 8632; Versions 1, 2, and 3 are all defined by this revision.

3 Many of the figures in this International Standard were produced using ISO/IEC 8632 standard Version 1 metafiles, as defined herein.

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[ISO/IEC 8632-1:1992](https://standards.iteh.ai/catalog/standards/sist/6a30859d-756b-4d4b-b9c9-d77cbaaaca0b/iso-iec-8632-1-1992)

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Information technology – Computer graphics – Metafile for the storage and transfer of picture description information –

Part 1 : Functional specification

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1 Scope

ISO/IEC 8632 provides a file format suitable for the storage and retrieval of picture description information. The file format consists of an ordered set of elements that can be used to describe pictures in a way that is compatible between systems of different architectures and devices of differing capabilities and design. This picture description includes the capability for describing static images.

The elements specified provide for the representation of a wide range of pictures on a wide range of graphical devices. The elements are split into groups that delimit major structures (metafiles and pictures), that specify the representations used within the metafile, that control the display of the picture, that perform basic drawing actions, that control the attributes of the basic drawing actions and that provide access to non-standard device capabilities.

The Metafile is defined in such a way that, in addition to sequential access to the whole metafile, random access to individual pictures is well-defined; whether this is available in any system that uses ISO/IEC 8632 depends on the medium, the encoding and the implementation.

In addition to a functional specification, three standard encodings of the metafile syntax are specified. These encodings address the needs of applications that require minimum metafile size, minimum effort to generate and interpret, and maximum flexibility for a human reader or editor of the metafile.

This part of ISO/IEC 8632 describes the format using an abstract syntax. The remaining three parts of ISO 8632 specify three standardized encodings that conform to this syntax: ISO/IEC 8632-2 specifies a character encoding that conforms to the rules for code extension specified in ISO 2022 in the category of complete coding system; ISO/IEC 8632-3 specifies a binary encoding; ISO/IEC 8632-4 specifies a clear text encoding.