ISO/IEC 9660:2023-01 (E)

Information processing - Volume and file structure of CD-ROM for information interchange

Contents

Page

Foreword ... **viii**

Introduction ... **x**

1 Scope ... **1**

2 Normative references ... **1**

3 Terms and definitions ... **1**

4 Notation ... **3**
4.1 Decimal and hexadecimal notations ... 3
4.2 Other notations ... 3

5 Conformance ... **3**
5.1 Conformance of a CD-ROM ... 3
5.2 Conformance of an information processing system ... 3

6 Requirements for a medium ... **4**

7 Volume structure ... **4**
7.1 Arrangement of data on a CD-ROM ... 4
7.1.1 Physical addresses ... 4
7.1.2 Logical sector ... 4
7.1.3 Volume space ... 4
7.2 Arrangement of the volume space ... 4
7.2.1 System area and data area ... 4
7.2.2 Logical block ... 5
7.3 Arrangement of the data area ... 5
7.4 Arrangement of an extent ... 5
7.4.1 Extent ... 5
7.4.2 Mode of recording a file section ... 5
7.4.3 Interleaved mode ... 6
7.4.4 Non-interleaved mode ... 7
7.4.5 Data length of a file section ... 8
7.4.6 Relation of extended attribute record to file section ... 8
7.4.7 Recording of a volume partition ... 8
7.5 File structure ... 8
7.5.1 Relation to file sections ... 8
7.5.2 Numbering of bytes in a file ... 8
7.5.3 Contents of a file ... 9
7.5.4 Associated file ... 9
7.6 Volume set ... 9
7.7 Volume descriptors ... 9
7.7.1 General ... 9
7.7.2 Volume descriptor set ... 9
7.8 Directory structure ... 10
7.8.1 Directory ... 10
7.8.2 Directory hierarchy ... 11
7.8.3 Relation of directory hierarchies ... 12
7.9 Path table ... 13
7.9.1 General ... 13
7.9.2 Order of path table records ... 13
7.9.3 Path table group ... 13
7.9.4 Recorded occurrences of the path table ... 13
7.9.5 Consistency of path tables between volumes of a volume group ... 14
7.10 Record structure ... 14
7.10.1 General ... 14

7.10.2 Characteristics 14
7.10.3 Measured data units (MDU) 14
7.10.4 Fixed-length records 15
7.10.5 Variable-length records 15

8 Recording of descriptor fields 15
8.1 8-bit numerical values 15
8.1.1 General 15
8.1.2 8-bit unsigned numerical values 15
8.1.3 8-bit signed numerical values 15
8.2 16-bit numerical value 16
8.2.1 General 16
8.2.2 Least significant byte first 16
8.2.3 Most significant byte first 16
8.2.4 Both-byte orders 16
8.3 32-bit numerical value 16
8.3.1 General 16
8.3.2 Least significant byte first 16
8.3.3 Most significant byte first 16
8.3.4 Both-byte orders 17
8.4 Character sets and coding 17
8.4.1 d-characters and a-characters 17
8.4.2 c-characters 17
8.4.3 Separators and filler 18
8.4.4 Use of characters in descriptor fields 18
8.4.5 Justification of characters 19
8.5 File identifier 19
8.5.1 File identifier format 19
8.5.2 File identifier length 19
8.6 Directory identifier 20
8.6.1 Directory identifier format 20
8.6.2 Reserved directory identifiers 20
8.6.3 Directory identifier length 20

9 Volume descriptors 20
9.1 Format of a volume descriptor 20
9.1.1 General 20
9.1.2 Volume descriptor type (BP 1) 20
9.1.3 Standard identifier (BP 2 to 6) 21
9.1.4 Volume descriptor version (BP 7) 21
9.1.5 Depends on volume descriptor type (BP 8 to 2 048) 21
9.2 Boot record 21
9.2.1 General 21
9.2.2 Volume descriptor type (BP 1) 21
9.2.3 Standard identifier (BP 2 to 6) 22
9.2.4 Volume descriptor version (BP 7) 22
9.2.5 Boot system identifier (BP 8 to 39) 22
9.2.6 Boot identifier (BP 40 to 71) 22
9.2.7 Boot system use (BP 72 to 2 048) 22
9.3 Volume descriptor set terminator 22
9.3.1 General 22
9.3.2 Volume descriptor type (BP 1) 22
9.3.3 Standard identifier (BP 2 to 6) 23
9.3.4 Volume descriptor version (BP 7) 23
9.3.5 Reserved for future standardization (BP 8 to 2 048) 23
9.4 Primary volume descriptor 23
9.4.1 General 23
9.4.2 Volume descriptor type (BP 1) 24
9.4.3 Standard identifier (BP 2 to 6) 24
9.4.4 Volume descriptor version (BP 7) 24
9.4.5 Unused field (BP 8) 24

9.4.6 System identifier (BP 9 to 40) 24
9.4.7 Volume identifier (BP 41 to 72) 25
9.4.8 Unused field (BP 73 to 80) 25
9.4.9 Volume space size (BP 81 to 88) 25
9.4.10 Unused field (BP 89 to 120) 25
9.4.11 Volume set size (BP 121 to 124) 25
9.4.12 Volume sequence number (BP 125 to 128) 25
9.4.13 Logical block size (BP 129 to 132) 25
9.4.14 Path table size (BP 133 to 140) 25
9.4.15 Location of occurrence of type L path table (BP 141 to 144) 25
9.4.16 Location of optional occurrence of type L path table (BP 145 to 148) 26
9.4.17 Location of occurrence of type M path table (BP 149 to 152) 26
9.4.18 Location of optional occurrence of type M path table (BP 153 to 156) 26
9.4.19 Directory record for root directory (BP 157 to 190) 26
9.4.20 Volume set identifier (BP 191 to 318) 26
9.4.21 Publisher identifier (BP 319 to 446) 26
9.4.22 Data preparer identifier (BP 447 to 574) 26
9.4.23 Application identifier (BP 575 to 702) 27
9.4.24 Copyright file identifier (BP 703 to 739) 27
9.4.25 Abstract file identifier (BP 740 to 776) 27
9.4.26 Bibliographic file identifier (BP 777 to 813) 27
9.4.27 Volume creation date and time (BP 814 to 830) 28
9.4.28 Volume modification date and time (BP 831 to 847) 28
9.4.29 Volume expiration date and time (BP 848 to 864) 28
9.4.30 Volume effective date and time (BP 865 to 881) 28
9.4.31 File structure version (BP 882) 28
9.4.32 Reserved for future standardization (BP 883) 29
9.4.33 Application use (BP 884 to 1 395) 29
9.4.34 Reserved for future standardization (BP 1 396 to 2 048) 29
9.5 Supplementary volume descriptor and enhanced volume descriptor 29
9.5.1 General 29
9.5.2 Volume descriptor type (BP 1) 30
9.5.3 Volume descriptor version (BP 7) 30
9.5.4 Volume flags (BP 8) 31
9.5.5 System identifier (BP 9 to 40) 31
9.5.6 Volume identifier (BP 41 to 72) 31
9.5.7 Escape sequences (BP 89 to 120) 31
9.5.8 Path table size (BP 133 to 140) 31
9.5.9 Location of occurrence of type L path table (BP 141 to 144) 32
9.5.10 Location of optional occurrence of type L path table (BP 145 to 148) 32
9.5.11 Location of occurrence of type M path table (BP 149 to 152) 32
9.5.12 Location of optional occurrence of type M path table (BP 153 to 156) 32
9.5.13 Directory record for root directory (BP 157 to 190) 32
9.5.14 Volume set identifier (BP 191 to 318) 32
9.5.15 Publisher identifier (BP 319 to 446) 32
9.5.16 Data preparer identifier (BP 447 to 574) 33
9.5.17 Application identifier (BP 575 to 702) 33
9.5.18 Copyright file identifier (BP 703 to 739) 33
9.5.19 Abstract file identifier (BP 740 to 776) 33
9.5.20 Bibliographic file identifier (BP 777 to 813) 34
9.5.21 Application use (BP 884 to 1 395) 34
9.6 Volume partition descriptor 34
9.6.1 General 34
9.6.2 Volume descriptor type (BP 1) 34
9.6.3 Standard identifier (BP 2 to 6) 34
9.6.4 Volume descriptor version (BP 7) 35
9.6.5 Unused field (BP 8) 35
9.6.6 System identifier (BP 9 to 40) 35

9.6.7 Volume partition identifier (BP 41 to 72) 35
9.6.8 Volume partition location (BP 73 to 80) 35
9.6.9 Volume partition size (BP 81 to 88) 35
9.6.10 System use (BP 89 to 2 048) 35

10 File and directory descriptors 35
10.1 Format of a directory record 35
10.1.1 General 35
10.1.2 Length of directory record (LEN_DR) (BP 1) 36
10.1.3 Extended attribute record length (BP 2) 36
10.1.4 Location of extent (BP 3 to 10) 36
10.1.5 Data length (BP 11 to 18) 36
10.1.6 Recording date and time (BP 19 to 25) 36
10.1.7 File flags (BP 26) 37
10.1.8 File unit size (BP 27) 38
10.1.9 Interleave gap size (BP 28) 38
10.1.10 Volume sequence number (BP 29 to 32) 38
10.1.11 Length of file identifier (LEN_FI) (BP 33) 38
10.1.12 File identifier [BP 34 to (33 + LEN_FI)] 38
10.1.13 Padding field [BP (34 + LEN_FI)] 39
10.1.14 System use [BP (LEN_DR - LEN_SU + 1) to LEN_DR] 39
10.2 Consistency of file attributes between directory records of a file 39
10.3 Order of directory records 39
10.4 Format of a path table record 40
10.4.1 General 40
10.4.2 Length of directory identifier (LEN_DI) (BP 1) 41
10.4.3 Extended attribute record length (BP 2) 41
10.4.4 Location of extent (BP 3 to 6) 41
10.4.5 Parent directory number (BP 7 to 8) 41
10.4.6 Directory identifier [BP 9 to (8 + LEN_DI)] 41
10.4.7 Padding field [BP (9 + LEN_ DI)] 41
10.5 Format of an extended attribute record 42
10.5.1 General 42
10.5.2 Owner identification (BP 1 to 4) 42
10.5.3 Group identification (BP 5 to 8) 42
10.5.4 Permissions (BP 9 to 10) 43
10.5.5 File creation date and time (BP 11 to 27) 44
10.5.6 File modification date and time (BP 28 to 44) 44
10.5.7 File expiration date and time (BP 45 to 61) 44
10.5.8 File effective date and time (BP 62 to 78) 44
10.5.9 Record format (BP 79) 44
10.5.10 Record attributes (BP 80) 44
10.5.11 Record length (BP 81 to 84) 45
10.5.12 System identifier (BP 85 to 116) 45
10.5.13 System use (BP 117 to 180) 45
10.5.14 Extended attribute record version (BP 181) 45
10.5.15 Length of escape sequences (BP 182) 45
10.5.16 Reserved for future standardization (BP 183 to 246) 45
10.5.17 Length of application use (BP 247 to 250) 45
10.5.18 Application use [BP 251 to (250 + LEN_AU)] 46
10.5.19 Escape sequences [BP (251 + LEN_AU) to (250 + LEN_ESC + LEN_AU)] 46
10.6 Consistency of file attributes between extended attribute records of a file 46

11 Levels of interchange 46
11.1 General 46
11.2 Level 1 46
11.3 Level 2 46
11.4 Level 3 46

12 Requirements for systems 47

13 Description of systems **47**

14 Requirements for an originating system **47**
14.1 General 47
14.2 Files 47
14.3 Descriptors 47
14.3.1 Primary volume descriptor, path table record and directory record 47
14.3.2 Supplementary volume descriptor and enhanced volume descriptor 49
14.3.3 Volume partition descriptor 49
14.3.4 Boot record 50
14.3.5 Extended attribute record 50
14.4 System area 50

15 Requirements for a receiving system **51**
15.1 General 51
15.2 Files 51
15.3 Descriptors 51
15.3.1 Implementation 51
15.3.2 Descriptor information 51
15.4 Restrictions 52
15.5 Levels of implementation 52
15.5.1 General 52
15.5.2 Level 1 52
15.5.3 Level 2 52

Annex A (informative) **ISO/IEC 646: International reference version (IRV)** **53**

Annex B (informative) **ISO 9660:1988 and Joliet Specification: Modifications** **55**

Bibliography **58**