

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