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**Information technology — Portable
Operating System Interface (POSIX™)
Base Specifications, Issue 7**

TECHNICAL CORRIGENDUM 2

*Technologies de l'information — Spécifications de base de l'interface
pour la portabilité des systèmes (POSIX™), Issue 7*

RECTIFICATIF TECHNIQUE 2



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IEEE Std 1003.1™-2008/Cor 2-2016

(Corrigendum to
IEEE Std 1003.1-2008)

The Open Group Technical Standard
Base Specifications, Issue 7

IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)

Base Specifications, Issue 7— Technical Corrigendum 2

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Approved 30 June 2016

IEEE-SA Standards Board

Approved 20 June 2016

The Open Group

IEEE Std 1003.1™-2008/Cor 2-2016
IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)
Base Specifications, Issue 7—Technical Corrigendum 2

Abstract: Problems discovered since the approval of IEEE Std 1003.1-2008 and IEEE Std 1003.1-2008/Cor 1-2013 are addressed.

Keywords: API, application program interface, argument, asynchronous, basic regular expression, batch job, batch system, BRE, built-in utility, byte, child, command language interpreter, CPU, ERE, extended regular expression, FIFO, file access control mechanism, IEEE 1003.1™, input/output, I/O, job control, network, portable operating system interface, POSIX™

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IEEE Std 1003.1™-2008/Cor 2-2016
IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)
Base Specifications, Issue 7—Technical Corrigendum 2

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IEEE Std 1003.1™-2008/Cor 2-2016 was prepared by the Austin Group, sponsored by the Portable Applications Standards Committee of the IEEE Computer Society, The Open Group, and ISO/IEC JTC 1/SC22.

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Introduction

This introduction is not part of IEEE Std 1003.1-2008/Cor 2, IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)/Base Specifications, Issue 7—Technical Corrigendum 2 .

This Technical Corrigendum addresses issues raised in defect reports and interpretation requests submitted up to 24 August 2015 that meet all of the following criteria:

- a) They are in the scope of the approved standard.
- b) They contain no new APIs (functions/utilities); however, they may add enumeration symbols, non-function #defines, and reserve additional namespaces.
- c) They address contradictions between different parts of the standard, or add consistency between the standard and overriding standards, or address security-related problems.

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NOTE—The editing instructions contained in this corrigendum define how to merge the material contained therein into the existing base standard to form the comprehensive standard.

1 **1. Changes to the Front Matter**

2 This section contains the set of changes to the text of the front matter.

3 *[Note to reviewers: References to defect reports are provided to aid reviewers.]*

4 **Change Number: Front Matter/TC2/D4/0001 [885]**

5 On Page: xlv Line: NA Section: Referenced Documents
6 (2013 edition Page: xlvii Line: NA)

7 In the line below the **Source Documents** header, change from:

8 base documents for POSIX.1-2008

9 to:

10 base documents for POSIX.1-2001

11 *Rationale:* Austin Group Defect Report(s) applied: 885. See <http://austingroupbugs.net/view.php?id=885>.

12 **Change Number: Front Matter/TC2/D4/0002 [726]**

13 On Page: xxxviii Line: NA Section: Acknowledgements

14 Remove the period from the first bullet list item.

15 *Rationale:* Austin Group Defect Report(s) applied: 726. See <http://austingroupbugs.net/view.php?id=726>.
16 Editorial change.

17

2. Changes to Base Definitions

This section contains the set of changes to the text of the Base Definitions.

[*Note to reviewers: References to defect reports are provided to aid reviewers.*]

Change Number: XBD/TC2/D4/0001 [591]

On Page: 9 Line: 266 Section: 1.7.1 Codes

Change from:

```
[OH]#include <sys/types.h>[/OH]
#include <grp.h>
struct group *getgrnam(const char *name);
```

The OH margin legend indicates that the marked header is not required on XSI-conformant systems.

to:

```
[OH]#include <sys/stat.h>[/OH]
#include <fcntl.h>
int open(const char *path, int oflag, ...);
```

The OH margin legend indicates that the optional header defines constants that will be needed if the function is called with certain flag arguments; thus it may be required for some of the functionality described, but is not needed otherwise.

Rationale: Austin Group Defect Report(s) applied: 591. See <http://austingroupbugs.net/view.php?id=591>.

Change Number: XBD/TC2/D4/0002 [810]

On Page: 16 Line: 493 Section: 2.1.1 Requirements

At the end of section 2.1.1, add a small-font note:

Note: If the documented method of setting up a conforming environment includes the need to set one or more environment variables, then the values of those environment variables cannot include any <space> characters, since the *confstr()* function must be able to return them in a <space>-separated list of variable=value pairs. See [xref to XSH confstr()].

Rationale: Austin Group Defect Report(s) applied: 810. See <http://austingroupbugs.net/view.php?id=810>.

Change Number: XBD/TC2/D4/0003 [637]

On Page: 17 Line: 561 Section: 2.1.3 POSIX Conformance

Change from:

```
_POSIX_TIMERS
-- Symbolic constants defined with a value greater than zero:
```

50 _POSIX_JOB_CONTROL
 51 _POSIX_SAVED_IDS

52 to:

53 _POSIX_TIMERS
 54 _POSIX2_C_BIND

55
 56 -- Symbolic constants defined with a value greater than zero:
 57 _POSIX_JOB_CONTROL
 58 _POSIX_REGEX
 59 _POSIX_SAVED_IDS
 60 _POSIX_SHELL

61 *Rationale:* Austin Group Defect Report(s) applied: 637. See <http://austingroupbugs.net/view.php?id=637>.

62 **Change Number:** XBD/TC2/D4/0004 [937]

63 On Page: 35 Line: 1195 Section: 3.17 Application
 64 (2013 edition Page: 35 Line: 1199)

65 After:

66 A computer program that performs some desired function.

67 add a new paragraph:

68 When the User Portability Utilities option is supported, requirements placed on applications relating to the
 69 use of standard utilities shall also apply to the actions of a user who is entering shell command language
 70 statements into an interactive shell.

71 *Rationale:* Austin Group Defect Report(s) applied: 937. See <http://austingroupbugs.net/view.php?id=937>.

72 **Change Number:** XBD/TC2/D4/0005 [516]

73 On Page: 37 Line: 1229 Section: 3.27 Async-Signal-Safe Function

74 Change the definition from:

75 A function that may be invoked, without restriction, from signal-catching functions. No function is async-
 76 signal-safe unless explicitly described as such.

77 to:

78 A function that can be called, without restriction, from signal-catching functions. Note that, although there
 79 is no restriction on the calls themselves, for certain functions there are restrictions on subsequent behavior
 80 after the function is called from a signal-catching function. No function is async-signal-safe unless
 81 explicitly described as such.

82 Note: Async-signal-safety is defined in detail in [xref to XSH 2.4.3].

83 *Rationale:* Austin Group Defect Report(s) applied: 516. See <http://austingroupbugs.net/view.php?id=516>.
 84 The restrictions on using longjmp() and siglongjmp() are more restrictive than they need to be on POSIX

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85 systems. The loosened restrictions presented here do not break existing implementations and make it easier
 86 for application writers to create portable applications.

87 **Change Number: XBD/TC2/D4/0006** [653]

88 On Page: 39 Line: 1274 Section: 3.40 Basename

89 Change from:

90 The final, or only, filename in a pathname.

91 to:

92 For pathnames containing at least one filename: the final, or only, filename in the pathname. For pathnames
 93 consisting only of <slash> characters: either "/" or "/" if the pathname consists of exactly two <slash>
 94 characters, and "/" otherwise.

95 *Rationale:* Austin Group Defect Report(s) applied: 653. See <http://austingroupbugs.net/view.php?id=653>.

96 **Change Number: XBD/TC2/D4/0007** [834]

97 On Page: 60 Line: 1775 Section: 3.168 File Mode

98 Change from:

99 An object containing the file mode bits and file type of a file.

100 to:

101 An object containing the file mode bits and some information about the file type of a file.

102 *Rationale:* Austin Group Defect Report(s) applied: 834. See <http://austingroupbugs.net/view.php?id=834>.

103 **Change Number: XBD/TC2/D4/0008** [511]

104 On Page: 63 Line: 1855 Section: 3.188 Group ID

105 Add a sentence:

106 The value (**gid_t**)-1 shall not be a valid group ID, but does have a defined use in some interfaces defined in
 107 this standard.

108 *Rationale:* Austin Group Defect Report(s) applied: 511. See <http://austingroupbugs.net/view.php?id=511>.

109 **Change Number: XBD/TC2/D4/0009** [584]

110 On Page: 63 Line: 1859 Section: 3.189 Group Name

111 Change from:

112 <hyphen>

113 to:

114 <hyphen-minus>

115 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

116 **Change Number: XBD/TC2/D4/0010** [690]

117 On Page: 66 Line: 1926 Section: 3 Definitions
 118 (2013 edition Page: 66 Line: 1935)

119 After section 3.208 ("Link Count"), insert a new section **3.209 Live Process** whose contents are copied
 120 from section 3.289 ("Process") page 80 lines 2243-2250 (2013 edition section 3.291 page 80 lines 2269-
 121 2275):

122 An address space with one or more threads executing within that address space, and the required system
 123 resources for those threads.

124 <small>**Note:** Many of the system resources defined by POSIX.1-2008 are shared among all of the threads
 125 within a process. These include the process ID, the parent process ID, process group ID, session
 126 membership, real, effective, and saved set-user-ID, real, effective, and saved set-group-ID, supplementary
 127 group IDs, current working directory, root directory, file mode creation mask, and file descriptors.</small>

128 *Rationale:* Austin Group Defect Report(s) applied: 690. See <http://austingroupbugs.net/view.php?id=690>.

129 **Change Number: XBD/TC2/D4/0011** [625]

130 On Page: 69 Line: 2000 Section: 3 Definitions

131 Add the following definitions in alphabetical order:

132 **Multi-threaded library**

133 A library containing object files that were produced by compiling with *c99* using the flags output by
 134 `getconf POSIX_V7_THREADS_CFLAGS`, or by compiling using a non-standard utility with equivalent
 135 flags, and which makes use of interfaces that are only made available by *c99* when the **-l pthread** option is
 136 used or makes use of `SIGEV_THREAD` notifications.

137 **Multi-threaded process**

138 A process that contains more than one thread.

139 **Multi-threaded program**

140 A program whose executable file was produced by compiling with *c99* using the flags output by `getconf`
 141 `POSIX_V7_THREADS_CFLAGS`, and linking with *c99* using the flags output by `getconf`
 142 `POSIX_V7_THREADS_LDFLAGS` and the **-l pthread** option, or by compiling and linking using a non-
 143 standard utility with equivalent flags. Execution of a multi-threaded program initially creates a single-
 144 threaded process; the process can create additional threads using `pthread_create()` or `SIGEV_THREAD`

145 notifications.

146 **Single-threaded process**

147 A process that contains a single thread.

148 **Single-threaded program**

149 A program whose executable file was produced by compiling with *c99* without using the flags output by
 150 `getconf POSIX_V7_THREADS_CFLAGS` and linking with *c99* using neither the flags output by `getconf`
 151 `POSIX_V7_THREADS_LDFLAGS` nor the **-l pthread** option, or by compiling and linking using a non-
 152 standard utility with equivalent flags. Execution of a single-threaded program creates a single-threaded
 153 process; if the process attempts to create additional threads using `pthread_create()` or `SIGEV_THREAD`
 154 notifications, the behavior is undefined. If the process uses `dlopen()` to load a multi-threaded library, the
 155 behavior is undefined.

156 *Rationale:* Austin Group Defect Report(s) applied: 625. See <http://austingroupbugs.net/view.php?id=625>.
 157 The standard does not adequately address the differences between single-threaded and multi-threaded
 158 processes and programs.

159 **Change Number: XBD/TC2/D4/0012** [584]

160 On Page: 77 Line: 2193 Section: 3. Definitions

161 After Section 3.275, add a new section:

162 **3.2xx Portable Filename**

163 A filename consisting only of characters from the portable filename character set.

164 <small>Note: Applications should avoid using filenames that have the <hyphen-minus> character as the
 165 first character since this may cause problems when filenames are passed as command line
 166 arguments.</small>

167 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.
 168 This is a layered change on XBD/TC1/D5/0010 [291]. The change is to replace <hyphen> with <hyphen-
 169 minus>.

170 **Change Number: XBD/TC2/D4/0013** [584]

171 On Page: 77 Line: 2199 Section: 3.276 Portable Filename Character Set

172 Change from:

173 <hyphen>

174 to:

175 <hyphen-minus>

176 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

177 **Change Number: XBD/TC2/D4/0014 [690]**

178 On Page: 80 Line: 2244-2250 Section: 3.289 Process
 179 (2013 edition Page: 80 Line: 2269-2275 Section: 3.291)

180 Replace the definition with:

181 A live process (see Section 3.xxx) or a zombie process (see Section 3.xxx). The lifetime of a process is
 182 described in Section 3.xxx.

183 On Page: 81 Line: 2270-2279 Section: 3.295 Process Lifetime
 184 (2013 edition Page: 81 Line: 2295-2304 Section: 3.297)

185 Change from:

186 The period of time that begins when a process is created and ends when its process ID is returned to the
 187 system. After a process is created by *fork()*, *posix_spawn()*, or *posix_spawnp()*, it is considered active. At
 188 least one thread of control and address space exist until it terminates. It then enters an inactive state where
 189 certain resources may be returned to the system, although some resources, such as the process ID, are still
 190 in use. When another process executes a *wait()*, *waitid()*, or *waitpid()* function for an inactive process, the
 191 remaining resources are returned to the system. The last resource to be returned to the system is the process
 192 ID. At this time, the lifetime of the process ends.

193
 194 <small>**Note:** The *fork()*, *posix_spawn()*, *posix_spawnp()*, *wait()*, *waitid()*, and *waitpid()* functions are
 195 defined in detail in the System Interfaces volume of POSIX.1-2008.</small>

196 to:

197 The period of time that begins when a process is created and ends when its process ID is returned to the
 198 system.

199
 200 See also *Live Process* in Section 3.xxx, *Process Termination* in Section 3.xxx, and *Zombie Process* in
 201 Section 3.xxx.

202
 203 <small>**Note:** Process creation is defined in detail in the descriptions of the *fork()*, *posix_spawn()*, and
 204 *posix_spawnp()* functions in the System Interfaces volume of POSIX.1-2008.</small>

205 On Page: 81 Line: 2293-2294 Section: 3.297 Process Termination
 206 (2013 edition Page: 81 Line: 2318-2319 Section: 3.299)

207 Change from:

208 <small>**Note:** The *_exit()*, *_Exit()*, *abort()*, and *exit()* functions are defined in detail in the System
 209 Interfaces volume of POSIX.1-2008.</small>

210 to:

211 <small>**Note:** The consequences of process termination can be found in the description of the *_Exit()*
 212 function in the System Interfaces volume of POSIX.1-2008. The *_exit()*, *_Exit()*, *abort()*, and *exit()*
 213 functions are defined in detail in the System Interfaces volume of POSIX.1-2008.</small>

214 *Rationale:* Austin Group Defect Report(s) applied: 690. See <http://austingroupbugs.net/view.php?id=690>.

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215 **Change Number: XBD/TC2/D4/0015** [896]

216 On Page: 90 Line: 2485 Section: 3.351 Source Code
 217 (2013 edition Page: 90 Line: 2510 Section: 3.353 Source Code)

218 Change from:

219 ... *ed, lex*, ...

220 to:

221 ... *ed, ex, lex*, ...

222 On Page: 90 Line: 2487 Section: 3.351 Source Code
 223 (2013 edition Page: 90 Line: 2512 Section: 3.353 Source Code)

224 Change from:

225 ... *ed, lex*, ...

226 to:

227 ... *ed, ex, lex*, ...

228 *Rationale:* Austin Group Defect Report(s) applied: 896. See <http://austingroupbugs.net/view.php?id=896>.

229 **Change Number: XBD/TC2/D4/0016** [511]

230 On Page: 102 Line: 2782 Section: 3.428 User ID

231 Add a sentence:

232 The value (**uid_t**)-1 shall not be a valid user ID, but does have a defined use in some interfaces defined in
 233 this standard.

234 *Rationale:* Austin Group Defect Report(s) applied: 511. See <http://austingroupbugs.net/view.php?id=511>.

235 **Change Number: XBD/TC2/D4/0017** [584]

236 On Page: 102 Line: 2786 Section: 3.429 User Name

237 Change from:

238 <hyphen>

239 to:

240 <hyphen-minus>

241 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

242

243 **Change Number: XBD/TC2/D4/0018** [690]

244 On Page: 105 Line: 2845-2846 Section: 3.444 Zombie Process
245 (2013 edition Page: 105 Line: 2871-2872 Section: 3.446)

246 Change from:

247 A process that has terminated and that is deleted when its exit status has been reported to another process
248 which is waiting for that process to terminate.

249 to:

250 The remains of a live process (see Section 3.xxx) after it terminates (see Section 3.xxx) and before its status
251 information (see XSH Section 2.13) is consumed by its parent process.

252 *Rationale:* Austin Group Defect Report(s) applied: 690. See <http://austingroupbugs.net/view.php?id=690>.

253 **Change Number: XBD/TC2/D4/0019** [934]

254 On Page: 107 Line: 2858 Section: 4 General Concepts
255 (2013 edition Page: 107 Line: 2884)

256 Add a new section (and renumber subsequent sections as needed):

257 **4.2 Default Initialization**

258 Default initialization causes an object to be initialized according to these rules:

- 259 • If it has pointer type, it is initialized to a null pointer.
- 260 • If it has arithmetic type, it is initialized to (positive or unsigned) zero.
- 261 • If it is an aggregate, every member is initialized (recursively) according to these rules.
- 262 • If it is a union, the first named member is initialized (recursively) according to these rules.

263 For an object of aggregate type with an explicit initializer, the initialization shall occur in initializer list
264 order, each initializer provided for a particular subobject overriding any previously listed initializer for the
265 same subobject; all subobjects that are not initialized explicitly shall be initialized implicitly according to
266 the rules for default initialization.

267 Objects with static storage duration but no explicit initializer shall be initialized implicitly according to the
268 rules for default initialization.

269 An explicit initializer of { 0 } works to perform explicit default initialization for any object of scalar or
270 aggregate type, and for any storage duration.

271 <small>Note: The C standard does not require a compiler to set any field alignment padding bits in a
272 structure or array definition to a particular value. Because of this, a structure initialized using { 0 } might
273 not *memcmp()* as equal to the same structure initialized using *memset()* to zero. For consistent results,
274 portable applications comparing structures should test each field individually.

275 Note: If an implementation treats the all-zero bit pattern of a pointer object as a null pointer, and the all-
276 zero bit pattern of a floating point object as equivalent to positive 0, then *memset()* to zero and *calloc()*
277 have the same effects as default initialization for all named members of a structure. [MX]Implementations

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278 that define `__STDC_IEC_559__` guarantee that the all-zero bit pattern of a floating point object represents
 279 `0.0.[MX]</small>`

280 *Rationale:* Austin Group Defect Report(s) applied: 934. See <http://austingroupbugs.net/view.php?id=934>.

281 **Change Number: XBD/TC2/D4/0020** [584]

282 On Page: 109 Line: 2914 Section: 4.7 Filename Portability

283 Change from:

284 `<hyphen>`

285 to:

286 `<hyphen-minus>`

287 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

288 **Change Number: XBD/TC2/D4/0021** [626]

289 On Page: 109 Line: 2917 Section: 4.8 File Times Update

290 Insert a new paragraph at the start of the section:

291 Many operations have requirements to update file timestamps. These requirements do not apply to streams
 292 that have no underlying file description (for example, memory streams created by `open_memstream()` have
 293 no underlying file description).

294 *Rationale:* Austin Group Defect Report(s) applied: 626. See <http://austingroupbugs.net/view.php?id=626>.

295 **Change Number: XBD/TC2/D4/0022** [863]

296 On Page: 110 Line: 2980 Section: 4.11 Memory Synchronization
 297 (2013 edition Page: 110 Line: 3004)

298 Change from:

299 The `pthread_once()` function shall synchronize memory for the first call in each thread for a given
 300 **`pthread_once_t`** object.

301 to:

302 The `pthread_once()` function shall synchronize memory for the first call in each thread for a given
 303 **`pthread_once_t`** object. If the `init_routine` called by `pthread_once()` is a cancellation point and is canceled,
 304 a call to `pthread_once()` for the same **`pthread_once_t`** object made from a cancellation cleanup handler
 305 shall also synchronize memory.

306 *Rationale:* Austin Group Defect Report(s) applied: 863. See <http://austingroupbugs.net/view.php?id=863>.

307

308 **Change Number: XBD/TC2/D4/0023** [541,649,825]

309 On Page: 112 Line: 3026 Section: 4.12 Pathname Resolution

310 Change from:

311 In all other cases, the system shall prefix the remaining pathname, if any, with the contents of the symbolic
 312 link. If the combined length exceeds {PATH_MAX}, and the implementation considers this to be an error,
 313 *errno* shall be set to [ENAMETOOLONG] and an error indication shall be returned.

314 to:

315 In all other cases, the system shall prefix the remaining pathname, if any, with the contents of the symbolic
 316 link, except that if the contents of the symbolic link is the empty string, then either pathname resolution
 317 shall fail with functions reporting an [ENOENT] error and utilities writing an equivalent diagnostic
 318 message, or the pathname of the directory containing the symbolic link shall be used in place of the
 319 contents of the symbolic link. If the contents of the symbolic link consist solely of <slash> characters, then
 320 all leading <slash> characters of the remaining pathname shall be omitted from the resulting combined
 321 pathname, leaving only the leading <slash> characters from the symbolic link contents. In the cases where
 322 prefixing occurs, if the combined length exceeds {PATH_MAX}, and the implementation considers this to
 323 be an error, pathname resolution shall fail with functions reporting an [ENAMETOOLONG] error and
 324 utilities writing an equivalent diagnostic message.

325 *Rationale:* Austin Group Defect Report(s) applied: 541,649,825. See

326 <http://austingroupbugs.net/view.php?id=541>.

327 See <http://austingroupbugs.net/view.php?id=649>.

328 See <http://austingroupbugs.net/view.php?id=825>.

329 The previous text was not historic practice on implementations that support //hostname as a special case in
 330 pathname resolution. For implementations that do not treat // as special, the change in handling of all-slash
 331 symbolic links has no effect on pathname resolution.

332 **Change Number: XBD/TC2/D4/0024** [825]

333 On Page: 112 Line: 3032 Section: 4.12 Pathname Resolution
 334 (2013 edition Page: 112 Line: 3056 Section: 4.12)

335 Change from:

336 If the system detects a loop in the pathname resolution process, it shall set *errno* to [ELOOP] and return an
 337 error indication.

338 to:

339 If the system detects a loop in the pathname resolution process, pathname resolution shall fail with
 340 functions reporting an [ELOOP] error and utilities writing an equivalent diagnostic message.

341 *Rationale:* Austin Group Defect Report(s) applied: 825. See <http://austingroupbugs.net/view.php?id=825>.

342

343 **Change Number: XBD/TC2/D4/0025** [543]

344 On Page: 116 Line: 3205 Section: 4.19 Treatment of Error Conditions for Mathematical Functions

345 Add a new paragraph before the last paragraph:

346 On implementations that support the IEC 60559 Floating-Point option, whether or when functions in the
 347 `<math.h>` header raise an undeserved underflow floating-point exception is unspecified. Otherwise, as
 348 implied by [xref to XSH *feraiseexcept()*] the `<math.h>` functions do not raise spurious floating-point
 349 exceptions (detectable by the user), other than the inexact floating-point exception.

350 *Rationale:* Austin Group Defect Report(s) applied: 543. See <http://austingroupbugs.net/view.php?id=543>.

351 **Change Number: XBD/TC2/D4/0026** [584]

352 On Page: 123 Line: 3411 Section: 5 File Format Notation

353 Change from:

354 indicates either a `<plus-sign>` or `<minus-sign>`,

355 to:

356 indicates either a `<plus-sign>` or `<hyphen-minus>`,

357 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

358 **Change Number: XBD/TC2/D4/0027** [584,967]

359 On Page: 125 Line: 3454 Section: 6.1 Portable Character Set
 360 (2013 edition Page: 125 Line: 3479)

361 Change from:

362 The first eight entries in [xref to Table 6-1] are defined in the ISO/IEC 6429:1992 standard and the rest of
 363 the characters are defined in the ISO/IEC 10646-1:2000 standard.

364 to:

365 The first eight entries in [xref to Table 6-1] and all characters in [xref to Table 6-2] are defined in the
 366 ISO/IEC 6429:1992 standard. The rest of the characters in [xref to Table 6-1] are defined in the ISO/IEC
 367 10646-1:2000 standard.

368 On Page: 125 Line: 3458 Section: 6.1 Portable Character Set
 369 (2013 edition Page: 125 Line: 3483)

370 Change from:

371 **Symbolic Name**

372 to:

373 **Symbolic Name(s)**374 On Page: 125 Line: 3460-3466 Section: 6.1 Portable Character Set
375 (2013 edition Page: 125 Line: 3485-3491)

376 Change from:

<alert>	<U0007>	BELL (BEL)
<backspace>	<U0008>	BACKSPACE (BS)
<tab>	<U0009>	CHARACTER TABULATION (HT)
<carriage-return>	<U000D>	CARRIAGE RETURN (CR)
<newline>	<U000A>	LINE FEED (LF)
<vertical-tab>	<U000B>	LINE TABULATION (VT)
<form-feed>	<U000C>	FORM FEED (FF)

377

378 to (note the description column changes to match the Unicode spec, and the change in line order):

<alert>, <BEL>	<U0007>	BELL
<backspace>, <BS>	<U0008>	BACKSPACE
<tab>, <HT>	<U0009>	CHARACTER TABULATION
<newline>, <LF>	<U000A>	LINE FEED (LF)
<vertical-tab>, <VT>	<U000B>	LINE TABULATION
<form-feed>, <FF>	<U000C>	FORM FEED (FF)
<carriage-return>, <CR>	<U000D>	CARRIAGE RETURN (CR)

379

380 On Page: 125 Line: 3480-3485 Section: 6.1 Portable Character Set
381 (2013 edition Page: 125 Line: 3505-3510)

382 Change from:

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<hyphen-minus>	-	<U002D>	HYPHEN-MINUS
<hyphen>	-	<U002D>	HYPHEN-MINUS
<full-stop>	.	<U002E>	FULL STOP
<period>	.	<U002E>	FULL STOP
<slash>	/	<U002F>	SOLIDUS
<solidus>	/	<U002F>	SOLIDUS

383

384 to (note that the glyph used for <hyphen-minus>, <hyphen> should be the same one that is used in the
 385 construct "('-)" in the rest of the standard):

<hyphen-minus>, <hyphen>	-	<U002D>	HYPHEN-MINUS
<full-stop>, <period>	.	<U002E>	FULL STOP
<slash>, <solidus>	/	<U002F>	SOLIDUS

386 On Page: 126 Line: 3531-3532 Section: 6.1 Portable Character Set
 387 (2013 edition Page: 126 Line: 3556-3557)

388 Change from:

<backslash>	\	<U005C>	REVERSE SOLIDUS
<reverse-solidus>	\	<U005C>	REVERSE SOLIDUS

389

390 to:

<backslash>, <reverse-solidus>	\	<U005C>	REVERSE SOLIDUS
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391

392 On Page: 126 Line: 3534-3537 Section: 6.1 Portable Character Set
 393 (2013 edition Page: 126 Line: 3559-3562)

394 Change from:

<circumflex-accent>	^	<U005E>	CIRCUMFLEX ACCENT
---------------------	---	---------	-------------------

<circumflex>	^	<U005E>	CIRCUMFLEX ACCENT
<low-line>	—	<U005F>	LOW LINE
<underscore>	—	<U005F>	LOW LINE

395

396 to:

<circumflex-accent>, <circumflex>	^	<U005E>	CIRCUMFLEX ACCENT
<low-line>, <underscore>	—	<U005F>	LOW LINE

397

398 On Page: 127 Line: 3566-3567 Section: 6.1 Portable Character Set
 399 (2013 edition Page: 127 Line: 3591-3592)

400 Change from:

<left-brace>	{	<U007B>	LEFT CURLY BRACKET
<left-curly-bracket>	{	<U007B>	LEFT CURLY BRACKET

401

402 to:

<left-brace>, <left-curly-bracket>	{	<U007B>	LEFT CURLY BRACKET
------------------------------------	---	---------	--------------------

403

404 On Page: 127 Line: 3569-3570 Section: 6.1 Portable Character Set
 405 (2013 edition Page: 127 Line: 3594-3595)

406 Change from:

<right-brace>	}	<U007D>	RIGHT CURLY BRACKET
<right-curly-bracket>	}	<U007D>	RIGHT CURLY BRACKET

407

408 to:

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<right-brace>, <right-curly-bracket>	}	<U007D>	RIGHT CURLY BRACKET
--------------------------------------	---	---------	---------------------

409

410 On Page: 127 Line: 3576-3578 Section: 6.1 Portable Character Set
 411 (2013 edition Page: 127 Line: 3601-3603)

412 Delete the sentence:

413 The table contains more than one symbolic character name for characters whose traditional name differs
 414 from the chosen name.

415 *Rationale:* Austin Group Defect Report(s) applied: 584,967. See
 416 <http://austingroupbugs.net/view.php?id=584>.
 417 See <http://austingroupbugs.net/view.php?id=967>.

418 **Change Number: XBD/TC2/D4/0028** [745]

419 On Page: 128 Line: 3589 Section: 6.1 Portable Character Set

420 Add a sentence as a new bullet item:

- 421 • The encoded values associated with <period>, <slash>, <newline> and <carriage-return> shall be
 422 invariant across all locales supported by the implementation.

423 *Rationale:* Austin Group Defect Report(s) applied: 745. See <http://austingroupbugs.net/view.php?id=745>.
 424 This is a layered change on XBD/TC1/D5/0019 [291].

425 **Change Number: XBD/TC2/D4/0029** [663,967]

426 On Page: 128 Line: 3596 Section: 6.2 Character Encoding
 427 (2013 edition Page: 128 Line: 3623)

428 Change from:

429 The POSIX locale contains the characters in [xref to Table 6-1], which have the properties listed in [xref to
 430 7.3.1]. In other locales, the presence, meaning, and representation of any additional characters are locale-
 431 specific.

432 to:

433 The POSIX locale shall contain 256 single-byte characters including the characters in [xref to Table 6-1]
 434 and [xref to Table 6-2], which have the properties listed in [xref to 7.3.1]. It is unspecified whether
 435 characters not listed in those two tables are classified as **punct** or **cntrl**, or neither. Other locales shall
 436 contain the characters in [xref to Table 6-1] and may contain any or all of the control characters identified
 437 in [xref to Table 6-2]; the presence, meaning, and representation of any additional characters are locale-
 438 specific.

439 *Rationale:* Austin Group Defect Report(s) applied: 663,967. See
 440 <http://austingroupbugs.net/view.php?id=663>.
 441 See <http://austingroupbugs.net/view.php?id=967>.

- 442 This is a layered change on XBD/TC1/D5/0020 [216].
 443 The intention was always that the POSIX locale should have an 8-bit-clean single-byte encoding. The
 444 omission of an explicit statement to that effect was an oversight.
- 445 **Change Number: XBD/TC2/D4/0030 [745]**
- 446 On Page: 128 Line: 3619 Section: 6.2 Character Encoding
- 447 Add a sentence:
- 448 Likewise, the byte values used to encode <period>, <slash>, <newline> and <carriage-return> shall not
 449 occur as part of any other character in any locale.
- 450 *Rationale:* Austin Group Defect Report(s) applied: 745. See <http://austingroupbugs.net/view.php?id=745>.
 451 This is a layered change on XBD/TC1/D5/0021 [291].
- 452 **Change Number: XBD/TC2/D4/0031 [967]**
- 453 On Page: 129 Line: 3655 Section: 6.4 Character Set Description File
 454 (2013 edition Page: 129 Line: 3683)
- 455 Change from:
- 456 Each symbolic name specified in [xref to Table 6-1] shall be included in the file and shall be mapped to a
 457 unique coding value, except as noted below. The glyphs represented by the C character constants '{', '}',
 458 '_', '-', '/', '\\', '.', and '^' have more than one symbolic name; all symbolic names for each such
 459 glyph shall be included, each with identical encoding. If some or all of the control characters identified in
 460 [xref to Table 6-2] are supported by the implementation, the symbolic names and their corresponding
 461 encoding values shall be included in the file. The encoding values shall each be represented in a single
 462 byte. Some of the encodings associated with the symbolic names in [xref to Table 6-2] may be the same as
 463 characters found in [xref to Table 6-1]; both names shall be provided for each encoding.
- 464 to:
- 465 Each symbolic name specified in [xref to Table 6-1] shall be included in the file. Each character in [xref to
 466 Table 6-1] (each row in the table) shall be mapped to a unique coding value. For each character in [xref to
 467 Table 6-2] that exists in the character set described by the file, the character's symbolic name(s) from [xref
 468 to Table 6-2] and the character's single-byte encoding value shall be included in the file.
- 469 On Page: 130 Line: 3664-3670 Section: 6.4 Character Set Description File
 470 (2013 edition Page: 130 Line: 3692-3698)
- 471 Change from:
- 472 **Table 6-2** Control Character Set
 473
- | | | | | | |
|-------|-------|-------|------|-------|-------|
| <ACK> | <DC2> | <ENQ> | <FS> | <IS4> | <SOH> |
| <BEL> | <DC3> | <EOT> | <GS> | <LF> | <STX> |

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<BS> <DC4> <ESC> <HT> <NAK> <SUB>

<CAN> <ETB> <IS1> <RS> <SYN>

<CR> <DLE> <ETX> <IS2> <SI> <US>

<DC1> <FF> <IS3> <SO> <VT>

474 to:

475 **Table 6-2** Non-Portable Control Characters
 476

Symbolic Name(s)	UCS	Description
<SOH>	<U0001>	START OF HEADING
<STX>	<U0002>	START OF TEXT
<ETX>	<U0003>	END OF TEXT
<EOT>	<U0004>	END OF TRANSMISSION
<ENQ>	<U0005>	ENQUIRY
<ACK>	<U0006>	ACKNOWLEDGE
<SO>	<U000E>	SHIFT OUT
<SI>	<U000F>	SHIFT IN
<DLE>	<U0010>	DATA LINK ESCAPE
<DC1>	<U0011>	DEVICE CONTROL ONE
<DC2>	<U0012>	DEVICE CONTROL TWO
<DC3>	<U0013>	DEVICE CONTROL THREE
<DC4>	<U0014>	DEVICE CONTROL FOUR
<NAK>	<U0015>	NEGATIVE ACKNOWLEDGE
<SYN>	<U0016>	SYNCHRONOUS IDLE
<ETB>	<U0017>	END OF TRANSMISSION BLOCK

<CAN>	<U0018>	CANCEL
	<U0019>	END OF MEDIUM
<SUB>	<U001A>	SUBSTITUTE
<ESC>	<U001B>	ESCAPE
<IS4>, <FS>	<U001C>	INFORMATION SEPARATOR FOUR
<IS3>, <GS>	<U001D>	INFORMATION SEPARATOR THREE
<IS2>, <RS>	<U001E>	INFORMATION SEPARATOR TWO
<IS1>, <US>	<U001F>	INFORMATION SEPARATOR ONE
	<U007F>	DELETE

477

478 *Rationale:* Austin Group Defect Report(s) applied: 967. See <http://austingroupbugs.net/view.php?id=967>.

479 **Change Number: XBD/TC2/D4/0032** [796]

480 On Page: 136 Line: 3846 Section: 7.2 POSIX Locale
 481 (2013 edition Page: 136 Line: 3882)

482 After:

483 Conforming systems shall provide a POSIX locale, also known as the C locale.

484 add:

485 In POSIX.1 the requirements for the POSIX locale are more extensive than the requirements for the C
 486 locale as specified in the C standard. However, in a conforming POSIX implementation, the POSIX locale
 487 and the C locale are identical.

488 *Rationale:* Austin Group Defect Report(s) applied: 796. See <http://austingroupbugs.net/view.php?id=796>.

489 **Change Number: XBD/TC2/D4/0033** [663]

490 On Page: 136 Line: 3849 Section: 7.2 POSIX locale
 491 (2013 edition Page: 136 Line: 3885)

492 Delete:

493 The tables in Section 7.3 describe the characteristics and behavior of the POSIX locale for data consisting
 494 entirely of characters from the portable character set and the control character set. For other characters, the
 495 behavior is unspecified.

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496 On Page: 139 Line: 3996 Section: 7.3.1 LC_CTYPE
 497 (2013 edition Page: 139 Line: 4032)

498 Change from:

499 In the POSIX locale, the 26 uppercase letters shall be included:

500 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

501 to:

502 In the POSIX locale, only:

503 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

504 shall be included.

505 On Page: 139 Line: 4003 Section: 7.3.1 LC_CTYPE
 506 (2013 edition Page: 139 Line: 4039)

507 Change from:

508 In the POSIX locale, the 26 lowercase letters shall be included:

509 a b c d e f g h i j k l m n o p q r s t u v w x y z

510 to:

511 In the POSIX locale, only:

512 a b c d e f g h i j k l m n o p q r s t u v w x y z

513 shall be included.

514 On Page: 139 Line: 4009 Section: 7.3.1 LC_CTYPE
 515 (2013 edition Page: 140 Line: 4045)

516 Change from:

517 In the POSIX locale, all characters in the classes **upper** and **lower** shall be included.

518 to:

519 In the POSIX locale, only characters in the classes **upper** and **lower** shall be included.

520 On Page: 141 Line: 4091 Section: 7.3.1 LC_CTYPE
 521 (2013 edition Page: 141 Line: 4127)

522 Change from:

523 In the POSIX locale, at a minimum, the 26 lowercase characters:

524 to:

525 In the POSIX locale, the 26 lowercase characters:

526 On Page: 142 Line: 4105 Section: 7.3.1 LC_CTYPE
 527 (2013 edition Page: 142 Line: 4141)

528 Change from:

529 In the POSIX locale, at a minimum, the 26 uppercase characters:

530 to:

531 In the POSIX locale, the 26 uppercase characters:

532 *Rationale:* Austin Group Defect Report(s) applied: 663. See <http://austingroupbugs.net/view.php?id=663>.

533 **Change Number: XBD/TC2/D4/0034 [663]**

534 On Page: 143 Line: 4142 Section: 7.3.1.1 LC_CTYPE Category in the POSIX Locale
 535 (2013 edition Page: 143 Line: 4178)

536 Change from:

537 The character classifications for the POSIX locale follow; the code listing depicts the *localedef* input, and
 538 the table represents the same information, sorted by character.

539 to:

540 The minimum character classifications for the POSIX locale follow; the code listing depicts the *localedef*
 541 input, and the table represents the same information, sorted by character. Implementations may add
 542 additional characters to the **cntrl** and **punct** classifications but shall not make any other additions.

543 On Page: 143 Line: 4145 Section: 7.3.1.1 LC_CTYPE Category in the POSIX Locale
 544 (2013 edition Page: 143 Line: 4181)

545 Change from:

546 # The following is the POSIX locale LC_CTYPE.
 547 # "alpha" is by default "upper" and "lower"
 548 # "alnum" is by definition "alpha" and "digit"
 549 # "print" is by default "alnum", "punct", and the <space>
 550 # "graph" is by default "alnum" and "punct"

551 to:

552 # The following is the minimum POSIX locale LC_CTYPE.
 553 # "alpha" is by definition "upper" and "lower"
 554 # "alnum" is by definition "alpha" and "digit"
 555 # "print" is by definition "alnum", "punct", and the <space>
 556 # "graph" is by definition "alnum" and "punct"

557 *Rationale:* Austin Group Defect Report(s) applied: 663. See <http://austingroupbugs.net/view.php?id=663>.

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558 **Change Number: XBD/TC2/D4/0035** [584]

559 On Page: 143 Line: 4173 Section: 7.3.1.1 LC_CTYPE Category in the POSIX Locale

560 Change from:

561 <hyphen>

562 to:

563 <hyphen-minus>

564 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

565 **Change Number: XBD/TC2/D4/0036** [584]

566 On Page: 144 Line: 4243 Section: 7.3.1.1 LC_CTYPE Category in the POSIX Locale

567 Change from:

568 <hyphen>

569 to:

570 <hyphen-minus>

571 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

572 **Change Number: XBD/TC2/D4/0037** [938]

573 On Page: 146 Line: 4330 Section: 7.3.2 LC_COLLATE
 574 (2013 edition Page: 147 Line: 4366)

575 Change from:

576 (*sort, uniq*, and so on)

577 to:

578 (*ls, sort*, and so on)

579 On Page: 147 Line: 4357 Section: 7.3.2 LC_COLLATE
 580 (2013 edition Page: 147 Line: 4393)

581 Add a new paragraph and two small-font notes after the numbered list:

582 All implementation-provided locales (either preinstalled or provided as locale definitions which can be
 583 installed later) should define a collation sequence that has a total ordering of all characters unless the locale
 584 name has an '@' modifier indicating that it has a special collation sequence (for example, @icase could
 585 indicate that each upper- and lower-case character pair collates equally).

586 <small>Note: a future version of this standard may require these locales to define a collation sequence that
587 has a total ordering of all characters (by changing "should" to "shall").</small>

588 <small>Note: users installing their own locales should ensure that they define a collation sequence with a
589 total ordering of all characters unless an '@' modifier in the locale name (such as @icase) indicates that it
590 has a special collation sequence.</small>

591 On Page: 149 Line: 4467 Section: 7.3.2.4 Collation Order
592 (2013 edition Page: 150 Line: 4503)

593 Add a new paragraph and a small-font note:

594 Weights should be assigned such that the collation sequence has a total ordering of all characters unless an
595 '@' modifier in the locale name indicates that it has a special collation sequence.

596 <small>Note: a future version of this standard may require a total ordering of all characters for
597 implementation-provided locales that do not have an '@' modifier in the locale name. See [xref to
598 7.3.2].</small>

599 On Page: 150 Line: 4481 Section: 7.3.2.4 Collation Order
600 (2013 edition Page: 150 Line: 4517)

601 Change from:

602 Characters specified via an explicit or implicit UNDEFINED special symbol shall by default be assigned
603 the same primary weight (that is, they belong to the same equivalence class).

604 to:

605 Characters specified via an explicit or implicit UNDEFINED special symbol shall by default be assigned
606 the same primary weight (that is, they belong to the same equivalence class) if the collation order has more
607 than one weight level. If the collation order has only one weight level, these characters should be assigned
608 unique primary weights, equal to the relative order of their character in the character collation sequence,
609 but may be assigned the same primary weight.

610 <small>Note: a future version of this standard may require these characters to be assigned unique primary
611 weights if the collation order has only one weight level.</small>

612 On Page: 150 Line: 4503 Section: 7.3.2.4 Collation Order
613 (2013 edition Page: 151 Line: 4539)

614 Delete the first entry in the example collation order:

615 UNDEFINED IGNORE; IGNORE

616 On Page: 150 Line: 4516 Section: 7.3.2.4 Collation Order
617 (2013 edition Page: 151 Line: 4552)

618 Add the following as the last entry in the example collation order:

619 UNDEFINED IGNORE; . . .

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- 620 On Page: 151 Line: 4519 Section: 7.3.2.4 Collation Order
621 (2013 edition Page: 151 Line: 4555)
- 622 Delete item 1 in the numbered list:
- 623 The **UNDEFINED** means that all characters not specified in this definition (explicitly or via the ellipsis)
624 shall be ignored for collation purposes.
- 625 and renumber items 2-4 to be 1-3.
- 626 On Page: 151 Line: 4527 Section: 7.3.2.4 Collation Order
627 (2013 edition Page: 151 Line: 4563)
- 628 Add a new item 4 to the numbered list:
- 629 The **UNDEFINED** means that all characters not specified in this definition (explicitly or via the ellipsis)
630 shall be ignored when comparing primary weights, and have individual secondary weights based on their
631 ordinal encoded values.
- 632 *Rationale:* Austin Group Defect Report(s) applied: 938. See <http://austingroupbugs.net/view.php?id=938>.
- 633 **Change Number: XBD/TC2/D4/0038** [663]
- 634 On Page: 151 Line: 4531 Section: 7.3.2.6 LC_COLLATE Category in the POSIX Locale
635 (2013 edition Page: 151 Line: 4567)
- 636 Change from:
- 637 The collation sequence definition of the POSIX locale follows; the code listing depicts the *localedef* input.
- 638 to:
- 639 The minimum collation sequence definition of the POSIX locale follows; the code listing depicts the
640 *localedef* input. All characters not explicitly listed here shall be inserted in the character collation order
641 after the listed characters and shall be assigned unique primary weights. If the listed characters have ASCII
642 encoding, the other characters shall be in ascending order according to their coded character set values;
643 otherwise, the order of the other characters is unspecified. The collation sequence shall not include any
644 multi-character collating elements.
- 645 On Page: 151 Line: 4534 Section: 7.3.2.6 LC_COLLATE Category in the POSIX Locale
646 (2013 edition Page: 151 Line: 4570)
- 647 Change from:
- 648 # This is the POSIX locale definition for the LC_COLLATE category.
649 # The order is the same as in the ASCII codeset.
- 650 to:
- 651 # This is the minimum input for the POSIX locale definition for the
652 # LC_COLLATE category. Characters in this list are in the same order
653 # as in the ASCII codeset.

654 *Rationale:* Austin Group Defect Report(s) applied: 663. See <http://austingroupbugs.net/view.php?id=663>.

655 **Change Number:** XBD/TC2/D4/0039 [584]

656 On Page: 152 Line: 4582 Section: 7.3.2.6 LC_COLLATE Category in the POSIX Locale

657 Change from:

658 <hyphen>

659 to:

660 <hyphen-minus>

661 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

662 **Change Number:** XBD/TC2/D4/0040 [912]

663 On Page: 163 Line: 5073 Section: 7.3.5.3 LC_TIME Category in the POSIX Locale
664 (2013 edition Page: 163 Line: 5109)

665 In the LC_TIME category definition, change from:

666 <percent_sign>

667 to:

668 <percent-sign>

669 *Rationale:* Austin Group Defect Report(s) applied: 912. See <http://austingroupbugs.net/view.php?id=912>.

670 **Change Number:** XBD/TC2/D4/0041 [584]

671 On Page: 179 Line: 5728 Section: 8.3 Other Environment Variables

672 In the description of TZ change from:

673 <plus-sign> ('+') character, or the minus-sign

674 to:

675 <plus-sign> ('+') character, or the <hyphen-minus>

676 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

677 **Change Number:** XBD/TC2/D4/0042 [554]

678 On Page: 182 Line: 5842-5848 Section: 9.2 Regular Expression General Requirements

679 Change from:

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680 In the regular expression processing described in POSIX.1-2008, the <newline> is regarded as an ordinary
 681 character and both a <period> and a non-matching list can match one. The Shell and Utilities volume of
 682 POSIX.1-2008 specifies within the individual descriptions of those standard utilities employing regular
 683 expressions whether they permit matching of <newline> characters; if not stated otherwise, the use of
 684 literal <newline> characters or any escape sequence equivalent produces undefined results.

685 to:

686 In the functions processing regular expressions described in the System Interfaces volume of POSIX.1-
 687 2008, the <newline> is regarded as an ordinary character and both a <period> and a non-matching list can
 688 match one. The Shell and Utilities volume of POSIX.1-2008 specifies within the individual descriptions of
 689 those standard utilities employing regular expressions whether they permit matching of <newline>
 690 characters; if not stated otherwise, the use of literal <newline> characters or any escape sequence
 691 equivalent in either patterns or matched text produces undefined results .

692 **Change Number: XBD/TC2/D4/0043 [554]**

693 On Page: 183 Line: 5875 Section: 9.3.2 BRE Ordinary Characters

694 Change from:

695 The interpretation of an ordinary character preceded by a <backslash> ('\') is undefined, except for:

696 to:

697 The interpretation of an ordinary character preceded by an unescaped <backslash> ('\') is undefined, except
 698 for:

699 On Page: 183 Line: 5887 Section: 9.3.3 BRE Special Characters

700 Change from:

701 that is not preceded by a <backslash>

702 to:

703 that is unescaped

704 On Page: 184 Line: 5894-5896 Section: 9.3.3 BRE Special Characters

705 Change from:

706 The <circumflex> shall be special when used as:

707 - An anchor (see Section XXX on page YYY)

708 - The first character of a bracket expression (see Section AAA on page BBB)

709 to:

710 The <circumflex> shall be special when used as an anchor (see Section XXX, on page YYY). The
 711 <circumflex> shall signify a non matching list expression when it occurs first in a list, immediately
 712 following a <left-square-bracket> (see Section AAA on page BBB).

- 713 *Rationale:* Austin Group Defect Report(s) applied: 554. See <http://austingroupbugs.net/view.php?id=554>.
- 714 **Change Number:** XBD/TC2/D4/0044 [938]
- 715 On Page: 184 Line: 5902 Section: 9.3.5 RE Bracket Expression
716 (2013 edition Page: 184 Line: 5944)
- 717 Change from:
- 718 A bracket expression (an expression enclosed in square brackets, "[]") is an RE that shall match a single
719 collating element contained in the non-empty set of collating elements represented by the bracket
720 expression.
- 721 to:
- 722 A bracket expression (an expression enclosed in square brackets, "[]") is an RE that shall match a specific
723 set of single characters, and may match a specific set of multi-character collating elements, based on the
724 non-empty set of list expressions contained in the bracket expression.
- 725 On Page: 184 Line: 5907 Section: 9.3.5 RE Bracket Expression
726 (2013 edition Page: 184 Line: 5949)
- 727 In list item 1, change from:
- 728 It consists of one or more expressions: collating elements, collating symbols, ...
- 729 to:
- 730 It consists of one or more expressions: ordinary characters, collating elements, collating symbols, ...
- 731 On Page: 184 Line: 5921 Section: 9.3.5 RE Bracket Expression
732 (2013 edition Page: 184 Line: 5963)
- 733 In list item 2, change from:
- 734 A matching list expression specifies a list that shall match any single-character collating element in any of
735 the expressions represented in the list. The first character in the list shall not be the <circumflex>; for
736 example, "[abc]" is an RE that matches any of the characters 'a', 'b', or 'c'.
- 737 to:
- 738 A matching list expression specifies a list that shall match any single character that is matched by one of
739 the expressions represented in the list. The first character in the list can not be the <circumflex>. An
740 ordinary character in the list should only match that character, but may match any single character that
741 collates equally with that character; for example, "[abc]" is an RE that should only match one of the
742 characters 'a', 'b', or 'c'.
- 743 <small>Note: a future version of this standard may require that an ordinary character in the list only
744 matches that character.</small>
- 745 *Rationale:* Austin Group Defect Report(s) applied: 938. See <http://austingroupbugs.net/view.php?id=938>.

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746 **Change Number: XBD/TC2/D4/0045** [872]

747 On Page: 184 Line: 5926 Section: 9.3.5 RE Bracket Expression
748 (2013 edition Page: 184 Line: 5968)

749 In list item 3, change from:

750 A non-matching list expression begins with a <circumflex> (^), and specifies a list that shall match any
751 single-character collating element except for the expressions represented in the list after the leading
752 <circumflex>.

753 to:

754 A non-matching list expression begins with a <circumflex> (^), and the matching behavior shall be the
755 logical inverse of the corresponding matching list expression (the same bracket expression but without the
756 leading <circumflex>).

757 *Rationale:* Austin Group Defect Report(s) applied: 872. See <http://austingroupbugs.net/view.php?id=872>.

758 **Change Number: XBD/TC2/D4/0046** [938]

759 On Page: 184 Line: 5928 Section: 9.3.5 RE Bracket Expression
760 (2013 edition Page: 184 Line: 5970)

761 In list item 3, change from:

762 For example, "[^abc]" is an RE that matches any character except the characters 'a', 'b', or 'c'.

763 to:

764 For example, if the RE "[abc]" only matches 'a', 'b', or 'c', then "[^abc]" is an RE that matches any character
765 except 'a', 'b', or 'c'.

766 On Page: 185 Line: 5953 Section: 9.3.5 RE Bracket Expression
767 (2013 edition Page: 185 Line: 5995)

768 In list item 6, change from:

769 The set of single-character collating elements whose characters belong to the character class

770 to:

771 The set of single characters that belong to the character class

772 *Rationale:* Austin Group Defect Report(s) applied: 938. See <http://austingroupbugs.net/view.php?id=938>.

773 **Change Number: XBD/TC2/D4/0047** [584]

774 On Page: 185 Line: 5972 Section: 9.3.5 RE Bracket Expression

775 Change from:

776 <hyphen>

777 to:

778 <hyphen-minus>

779 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

780 **Change Number:** XBD/TC2/D4/0048 [584]

781 On Page: 186 Line: 5982,5989,5992 Section: 9.3.5 RE Bracket Expression

782 Change from:

783 <hyphen>

784 to:

785 <hyphen-minus>

786 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

787 **Change Number:** XBD/TC2/D4/0049 [595]

788 On Page: 186 Line: 6016 Section: 9.3.6 BREs Matching Multiple Characters

789 Change rule 3 from:

790 For example, the expression "`^(.*)\1$`" matches lines consisting of two adjacent appearances of the same
791 string,

792 to:

793 For example, the expression "`^(.*)\1$`" matches strings consisting of two adjacent appearances of the
794 same substring,

795 On Page: 187 Line: 6053 Section: 9.3.8 BRE Expression Anchoring

796 Change from:

797 A BRE can be limited to matching strings that begin or end a line; this is called "anchoring".

798 to:

799 A BRE can be limited to matching expressions that begin or end a string; this is called "anchoring".

800 *Rationale:* Austin Group Defect Report(s) applied: 595. See <http://austingroupbugs.net/view.php?id=595>.

801

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802 **Change Number: XBD/TC2/D4/0050 [554]**

803 On Page: 188 Line: 6082-6083 Section: 9.4.2 ERE Ordinary Characters

804 Change from:

805 The interpretation of an ordinary character preceded by a <backslash> ('\') is undefined.

806 to:

807 The interpretation of an ordinary character preceded by an unescaped <backslash> ('\') is undefined, except
808 in the context of a bracket expression (see XREF to ERE bracket expression).

809 On Page: 188 Line: 6092 Section: 9.4.3 ERE Special Characters

810 Add the following text after line 6092:

811 A <left-square-bracket> that is unescaped and is not part of a bracket expression also produces undefined
812 results.

813 On Page: 188 Line: 6098-6099 Section: 9.4.3 ERE Special Characters

814 Change from:

815 If these characters appear first in an ERE, or immediately following a <vertical-line>, <circumflex>, or
816 <left-parenthesis>

817 to:

818 If these characters appear first in an ERE, or immediately following an unescaped <vertical-line>,
819 <circumflex>, <dollar-sign>, or <left-parenthesis>

820 On Page: 189 Line: 6106-6109 Section: 9.4.3 ERE Special Characters

821 Change from:

822 The <circumflex> shall be special when used as:

- 823 - An anchor (see Section XXX on page YYY)
- 824 - The first character of a bracket expression (see Section AAA on page BBB)

825 to:

826 The <circumflex> shall be special when used as an anchor (see Section XXX, on page YYY). The
827 <circumflex> shall signify a non matching list expression when it occurs first in a list, immediately
828 following a <left-square-bracket> (see Section AAA on page BBB).

829 *Rationale:* Austin Group Defect Report(s) applied: 554. See <http://austingroupbugs.net/view.php?id=554>.

830

- 831 **Change Number: XBD/TC2/D4/0051** [595]
- 832 On Page: 190 Line: 6175 Section: 9.4.9 ERE Expression Anchoring
- 833 Change from:
- 834 An ERE can be limited to matching strings that begin or end a line; this is called "anchoring".
- 835 to:
- 836 An ERE can be limited to matching expressions that begin or end a string; this is called "anchoring".
- 837 *Rationale:* Austin Group Defect Report(s) applied: 595. See <http://austingroupbugs.net/view.php?id=595>.
- 838 **Change Number: XBD/TC2/D4/0052** [554]
- 839 On Page: 192 Line: 6233 Section: 9.5.1 BRE/ERE Grammar Lexical Conventions
- 840 For token SPEC_CHAR delete the phrase:
- 841 or when first in a bracket expression
- 842 On Page: 195 Line: 6379-6380 Section: 9.5.3 ERE Grammar
- 843 Change from:
- 844 The ERE grammar does not permit several constructs that previous sections specify as having undefined
845 results:
- 846 to:
- 847 The ERE grammar does not permit several constructs that previous sections specify as having undefined
848 results. Additionally, there are some constructs which the grammar permits but which still give undefined
849 results:
- 850 On Page: 195 Line: 6381 Section: 9.5.3 ERE Grammar
- 851 Change from:
- 852 ORD_CHAR preceded by a <backslash> character
- 853 to:
- 854 ORD_CHAR preceded by an unescaped <backslash> character
- 855 On Page: 195 Line: 6383 Section: 9.5.3 ERE Grammar
- 856 Add '\$' to the list of characters.
- 857 *Rationale:* Austin Group Defect Report(s) applied: 554. See <http://austingroupbugs.net/view.php?id=554>.

IEEE Std 1003.1™-2008/Cor 2-2016
 IEEE Standard for Information Technology—Portable Operating System Interface (POSIX™)
 Base Specifications, Issue 7—Technical Corrigendum 2

858 **Change Number: XBD/TC2/D4/0053** [916]

859 On Page: 195 Line: 6387 Section: 9.5.3 ERE Grammar
 860 (2013 edition Page: 195 Line: 6433)

861 Change from:

862 Conforming applications cannot use such constructs.

863 to:

864 Strictly conforming applications cannot use such constructs.

865 *Rationale:* Austin Group Defect Report(s) applied: 916. See <http://austingroupbugs.net/view.php?id=916>.

866 **Change Number: XBD/TC2/D4/0054** [967]

867 On Page: 198 Line: 6438-6454 Section: 10.2 Output Devices and Terminal Types
 868 (2013 edition Page: 198 Line: 6484-6500)

869 Delete the two **Symbolic Name** columns from Table 10-1.

870 *Rationale:* Austin Group Defect Report(s) applied: 967. See <http://austingroupbugs.net/view.php?id=967>.

871 **Change Number: XBD/TC2/D4/0055** [745]

872 On Page: 204 Line: 6682,6684 Section: 11.1.9 Special Characters

873 On line 6682, for CR change from:

874 carriage-return

875 to:

876 <carriage-return>

877 On line 6684, append a sentence to the description of CR:

878 It cannot be changed.

879 *Rationale:* Austin Group Defect Report(s) applied: 745. See <http://austingroupbugs.net/view.php?id=745>.

880 **Change Number: XBD/TC2/D4/0056** [584]

881 On Page: 213 Line: 7006 Section: 12.1 Utility Argument Syntax

882 Change from:

883 <hyphen>

884 to:

885 <hyphen-minus>

886 *Rationale:* Austin Group Defect Report(s) applied: 584. See <http://austingroupbugs.net/view.php?id=584>.

887 **Change Number:** XBD/TC2/D4/0057 [813]

888 On Page: 214 Line: 7056 Section: 12.1 Utility Argument Syntax

889 After the third bullet item, add a new bullet item:

- 890 • When the utility description states that the number is a file size-related value (such as a file size or
 891 offset, line number, or block count), numerals in the range 0 to the maximum file size supported
 892 by the implementation are syntactically recognized as numeric values (see XCU 1.5
 893 Considerations for Utilities in Support of Files of Arbitrary Size). Where negative values are
 894 permitted, any value in the range -(maximum file size) to the maximum file size is accepted.

895 *Rationale:* Austin Group Defect Report(s) applied: 813. See <http://austingroupbugs.net/view.php?id=813>.
 896 The normative requirement in XCU 1.5 does not match the syntax utility guidelines which suggest very
 897 large values may be supported but are not required to be.

898 **Change Number:** XBD/TC2/D4/0058 [579]

899 On Page: 220 Line: 7211 Section: <aio.h>

900 In the DESCRIPTION section, change from:

901 The tag **sigevent** shall be declared as naming an incomplete structure type, the contents of which are
 902 described in the <**signal.h**> header.

903 to:

904 The <**aio.h**> header shall define the **sigevent** structure and **sigval** union as described in <**signal.h**>.

905 *Rationale:* Austin Group Defect Report(s) applied: 579. See <http://austingroupbugs.net/view.php?id=579>.

906 **Change Number:** XBD/TC2/D4/0059 [496]

907 On Page: 236 Line: 7737 Section: <errno.h>

908 In the DESCRIPTION section, change from:

909 [ENOSYS] Function not supported.

910 to:

911 [ENOSYS] Functionality not supported.

912 *Rationale:* Austin Group Defect Report(s) applied: 496. See <http://austingroupbugs.net/view.php?id=496>.