

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

Base Specifications, Issue 7— Technical Corrigendum 2

IEEE Computer Society

and

The Open Group

Sponsored by the
Portable Applications Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 1003.1™-2008/Cor 2-2016
(Corrigendum to
IEEE Std 1003.1-2008)

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Base Specifications, Issue 7— Technical Corrigendum 2

Sponsor

**Portable Applications Standards Committee
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IEEE Computer Society**

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The Open Group

Approved 30 June 2016

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The Open Group

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

Base Specifications, Issue 7— Technical Corrigendum 2

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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. Changes to the Front Matter

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

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

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

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

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

base documents for POSIX.1-2008

to:

base documents for POSIX.1-2001

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

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

On Page: xxxviii Line: NA Section: Acknowledgements

Remove the period from the first bullet list item.

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

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

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

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

On Page: 39 Line: 1274 Section: 3.40 Basename

Change from:

The final, or only, filename in a pathname.

to:

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

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

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

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

Change from:

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

to:

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

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

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

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

Add a sentence:

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

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

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

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

Change from:

<hyphen>

to:

<hyphen-minus>

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

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

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

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

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

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

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

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

On Page: 69 Line: 2000 Section: 3 Definitions

Add the following definitions in alphabetical order:

Multi-threaded library

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

Multi-threaded process

A process that contains more than one thread.

Multi-threaded program

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

notifications.

Single-threaded process

A process that contains a single thread.

Single-threaded program

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

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

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

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

After Section 3.275, add a new section:

3.2xx Portable Filename

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

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

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

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

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

Change from:

<hyphen>

to:

<hyphen-minus>

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>.

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

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

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:

<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 "<hyphen-minus>" 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
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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:

<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>.

This is a layered change on XBD/TC1/D5/0020 [216].
The intention was always that the POSIX locale should have an 8-bit-clean single-byte encoding. The omission of an explicit statement to that effect was an oversight.

Change Number: XBD/TC2/D4/0030 [745]

On Page: 128 Line: 3619 Section: 6.2 Character Encoding

Add a sentence:

Likewise, the byte values used to encode <period>, <slash>, <newline> and <carriage-return> shall not occur as part of any other character in any locale.

Rationale: Austin Group Defect Report(s) applied: 745. See <http://austingroupbugs.net/view.php?id=745>.
This is a layered change on XBD/TC1/D5/0021 [291].

Change Number: XBD/TC2/D4/0031 [967]

On Page: 129 Line: 3655 Section: 6.4 Character Set Description File
(2013 edition Page: 129 Line: 3683)

Change from:

Each symbolic name specified in [xref to Table 6-1] shall be included in the file and shall be mapped to a unique coding value, except as noted below. The glyphs represented by the C character constants '{', '}', '_', '-', '\'', '\\', '.', '^', and '^' have more than one symbolic name; all symbolic names for each such glyph shall be included, each with identical encoding. If some or all of the control characters identified in [xref to Table 6-2] are supported by the implementation, the symbolic names and their corresponding encoding values shall be included in the file. The encoding values shall each be represented in a single byte. Some of the encodings associated with the symbolic names in [xref to Table 6-2] may be the same as characters found in [xref to Table 6-1]; both names shall be provided for each encoding.

to:

Each symbolic name specified in [xref to Table 6-1] shall be included in the file. Each character in [xref to Table 6-1] (each row in the table) shall be mapped to a unique coding value. For each character in [xref to Table 6-2] that exists in the character set described by the file, the character's symbolic name(s) from [xref to Table 6-2] and the character's single-byte encoding value shall be included in the file.

On Page: 130 Line: 3664-3670 Section: 6.4 Character Set Description File
(2013 edition Page: 130 Line: 3692-3698)

Change from:

Table 6-2 Control Character Set

<ACK>	<DC2>	<ENQ>	<FS>	<IS4>	<SOH>
<BEL>	<DC3>	<EOT>	<GS>	<LF>	<STX>

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

<CAN> <DEL> <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
<DEL>	<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.

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>.

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

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

Change from:

<hyphen>

to:

<hyphen-minus>

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

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

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

Change from:

<hyphen>

to:

<hyphen-minus>

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

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

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

Change from:

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

to:

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

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

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

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

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

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

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

Add a new paragraph and a small-font note:

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

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

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

Change from:

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

to:

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

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

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

Delete the first entry in the example collation order:

UNDEFINED IGNORE; IGNORE

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

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

UNDEFINED IGNORE; . . .

- 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:

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

to:

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

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

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

Change from:

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

to:

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

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

Change from:

that is not preceded by a <backslash>

to:

that is unescaped

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

Change from:

The <circumflex> shall be special when used as:

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

to:

The <circumflex> shall be special when used as an anchor (see Section XXX, on page YYY). The <circumflex> shall signify a non matching list expression when it occurs first in a list, immediately 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>.

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:

<hyphen>

to:

<hyphen-minus>

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

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

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

Change from:

<hyphen>

to:

<hyphen-minus>

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

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

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

Change rule 3 from:

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

to:

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

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

Change from:

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

to:

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

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

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

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

Change from:

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

to:

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

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

Add the following text after line 6092:

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

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

Change from:

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

to:

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

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

Change from:

The <circumflex> shall be special when used as:

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

to:

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

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

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>.

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>

to:

<hyphen-minus>

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

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

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

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

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

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

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

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

In the DESCRIPTION section, change from:

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

to:

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

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

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

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

In the DESCRIPTION section, change from:

[ENOSYS] Function not supported.

to:

[ENOSYS] Functionality not supported.

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

913 **Change Number: XBD/TC2/D4/0060** [847]

914 On Page: 240 Line: 7878 Section: <fcntl.h>
915 (2013 edition Page: 238 Line: 7885)

916 In the DESCRIPTION section, change from:

917 O_DIRECTORY Fail if not a directory.

918 to:

919 O_DIRECTORY Fail if file is a non-directory file.

920 *Rationale:* Austin Group Defect Report(s) applied: 847. See <http://austingroupbugs.net/view.php?id=847>.

921 **Change Number: XBD/TC2/D4/0061** [666]

922 On Page: 270 Line: 8853-8856 Section: <limits.h>

923 In the DESCRIPTION section, delete:

924 {RE_DUP_MAX}

925 Maximum number of repeated occurrences of a BRE or ERE interval expression; see Section 9.3.6
926 (on page 186) and Section 9.4.6 (on page 189).

927 Minimum Acceptable Value: {_POSIX2_RE_DUP_MAX}

928 On Page: 273 Line: 9001-9003 Section: <limits.h>

929 Change from:

930 {RE_DUP_MAX}

931 Maximum number of repeated occurrences of a regular expression permitted when using the interval
932 notation $\{m,n\}$; see Chapter 9 (on page 181).

933 to (copied from line 8854):

934 {RE_DUP_MAX}

935 Maximum number of repeated occurrences of a BRE or ERE interval expression; see Section 9.3.6
936 (on page 186) and Section 9.4.6 (on page 189).

937 On Page: 273 Line: 9004 Section: <limits.h>

938 Change from:

939 {_POSIX2_RE_DUP_MAX}

940 to:

941 {_POSIX_RE_DUP_MAX}

942 On Page: 275 Line: 9076-9077 Section: <limits.h>

- 943 Change from:
- 944 The number of repeated occurrences of a BRE permitted by the *regexec()* and *regcomp()* functions when
945 using the interval notation $\{(m,n)\}$; see Section 9.3.6 (on page 186).
- 946 to (copied from line 8854):
- 947 Maximum number of repeated occurrences of a BRE or ERE interval expression; see Section 9.3.6 (on
948 page 186) and Section 9.4.6 (on page 189).
- 949 On Page: 277 Line: 9174-9175 Section: <limits.h>
- 950 Change from:
- 951 Maximum number of repeated occurrences of a regular expression permitted when using the interval
952 notation $\{m,n\}$; see Chapter 9 (on page 181).
- 953 to (copied from line 8854):
- 954 Maximum number of repeated occurrences of a BRE or ERE interval expression; see Section 9.3.6 (on
955 page 186) and Section 9.4.6 (on page 189).
- 956 *Rationale:* Austin Group Defect Report(s) applied: 666. See <http://austingroupbugs.net/view.php?id=666>.
- 957 **Change Number: XBD/TC2/D4/0062 [781]**
- 958 On Page: 283 Line: 9438 Section: <locale.h>
959 (2013 edition Page: 286 Line: 9521)
- 960 In the DESCRIPTION section, change from:
- 961 Implementations may add additional masks using the form *LC_** and an uppercase letter.
- 962 to:
- 963 Additional macro definitions, beginning with the characters *LC_** and an uppercase letter, may also be
964 specified by the implementation.
- 965 On Page: 284 Line: 9447 Section: <locale.h>
966 (2013 edition Page: 287 Line: 9530)
- 967 Delete:
- 968 [CX]Implementations may add additional masks using the form *LC_ *_MASK*. [CX]
- 969 On Page: 284 Line: 9464 Section: <locale.h>
970 (2013 edition Page: 287 Line: 9547)
- 971 In the RATIONALE section, change from:
- 972 None.