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# Standards Reports

## What's New in Technical Corrigendum Number 1 for IEEE Std 1003.1-2001

by **Andrew Josey**

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The IEEE-SA Standards Board approved Technical Corrigendum Number 1 (TC1) on 10th December 2002. The governing board of The Open Group approved the document on 7 February 2003.

The following article presents an overview of what has been changed by this corrigendum.

### ISSUES RELATED TO THE BASE DEFINITIONS

#### GLOB.H

Technical Corrigendum Number 1 item XBD/TC1/D6/8 is applied, correcting the `glob()` prototype definition by removing the `restrict` qualifier from the function pointer argument.

#### LANGINFO.H

Technical Corrigendum Number 1 item XBD/TC1/D6/9 is applied, adding a sentence to the “Meaning” column entry for the `CRNCYSTR` constant. This change is to accommodate historic practice.

#### LIMITS.H

Technical Corrigendum Number 1 item XBD/TC1/D6/10 is applied, updating the value of `_POSIX_CHILD_MAX` from 6 to 25. This corrects an editorial error and is for FIPS 151-2 alignment.

#### NETDB.H

Technical Corrigendum Number 1 item XBD/TC1/D6/11 is applied, adding a description of the `NI_NUMERICSCOPE` macro and correcting the `getnameinfo()` function prototype. These changes are for alignment with the IETF IPv6 specification.

#### NETINET/IN.H

Technical Corrigendum Number 1 item XBD/TC1/D6/12 is applied, adding “const” qualifiers to the `in6addr_any` and `in6addr_loopback` external variables.

#### PTHREAD.H

Technical Corrigendum Number 1 item XBD/TC1/D6/13 is applied, correcting shading errors that were in contradiction with the System Interfaces Volume.

#### SIGNAL.H

Technical Corrigendum Number 1 item XBD/TC1/D6/14 is applied, changing the descriptive text for members of struct `sigaction`. Technical Corrigendum Number 1 item XBD/TC1/D6/15 is applied, correcting the definition of the `sa_sigaction` member of struct `sigaction`.

#### SYS/MMAN.H

Technical Corrigendum Number 1 item XBD/TC1/D6/16 is applied, correcting margin code and shading errors for the `mlock()` and `munlock()` functions.

#### SYS/STAT.H

Technical Corrigendum Number 1 item XBD/TC1/D6/17 is applied, adding text regarding the `st_blocks` members of the `stat` structure to the `RATIONALE`.

#### SYS/STATVFS.H

Technical Corrigendum Number 1 item XBD/TC1/D6/18 is applied, changing the description of `ST_NOSUID` from “Does not support `setuid()/setgid()` semantics” to “Does not support the semantics of the `ST_ISUID` and `ST_ISGID` file mode bits”.

#### TERMIOS.H

Technical Corrigendum Number 1 item XBD/TC1/D6/19 is applied, changing `ECHOK` to `ECHOKE` in the `APPLICATION USAGE` section.

#### UNISTD.H

Technical Corrigendum Number 1 item XBD/TC1/D6/2 is applied, changing “Thread Stack Address Size” to “Thread Stack Size Attribute”.

Technical Corrigendum Number 1 item XBD/TC1/D6/20 is applied, adding the `_POSIX_IPV6`, `_SC_V6`, and `_SC_RAW_SOCKETS` symbols.

Technical Corrigendum Number 1 item XBD/TC1/D6/21 is applied, correcting the description in “Constants for Functions” for the `_CS_POSIX_V6_LP64_OFF64_CFLAGS`, `_CS_POSIX_V6_LP64_OFF64_LDFLAGS`, and `_CS_POSIX_V6_LP64_OFF64_LIBS` symbols.

Technical Corrigendum Number 1 item XBD/TC1/D6/22 is applied, removing the shading for the `_PC*` and `_SC*` constants, since these are mandatory upon all implementations.

Technical Corrigendum Number 1 item XBD/TC1/D6/23 is applied, adding the `_PC_SYMLINK_MAX` and `_SC_SYMLINK_MAX` constants.

Technical Corrigendum Number 1 item XBD/TC1/D6/24 is applied, correcting the shading and margin code for the `fsync()` function.

Technical Corrigendum Number 1 item XBD/TC1/D6/25 is applied, adding the following text to `APPLICATION USAGE`: “New applications should not use `_XOPEN_SHM` or `_XOPEN_ENH_I18N`”.

#### WCHAR.H

Technical Corrigendum Number 1 item XBD/TC1/D6/26 is applied, adding the `APPLICATION USAGE` section.

## RATIONALE CHANGES RELATED TO THE BASE DEFINITIONS

### A.4.10

Add to end of A.4.10, Memory Synchronization p37 l 1465.

Technical Corrigendum Number 1 item XBD/TC1/D6/4 is applied, adding a new paragraph beneath the table of functions: “The `pthread_once()` function shall synchronize memory for the first call in each thread for a given `pthread_once_t` object.”

### A.7.3.3 LC-MONETARY

Line 1986, add after “Technical Corrigendum No. 1”, “item XBD/TC1/D6/6.”

Add another paragraph at end of this section:

Technical Corrigendum Number 1 item XBD/TC1/D6/5 is applied, adding the `int_[np]_*` values to the POSIX locale definition of `LC_MONETARY`.

#### A.8.3 TZ

Add to the end of the TZ section (line 2339).

Technical Corrigendum Number 1 item XBD/TC1/D6/7 is applied, adding the `ctime_r()` and `localtime_r()` functions to the list of functions that use the TZ environment variable.

## ISSUES RELATED TO THE SYSTEM INTERFACES

### ABORT

Technical Corrigendum Number 1 item XSH/TC1/D6/10 is applied, changing the DESCRIPTION of abnormal termination processing and adding to the RATIONALE section.

### BSEARCH

Technical Corrigendum Number 1 item XSH/TC1/D6/11 is applied, adding to the last sentence at the end of the first non-shaded paragraph in the DESCRIPTION and adding the three following paragraphs. The RATIONALE section is also updated. These changes are for alignment with the ISO C standard.

### CLOSE

Technical Corrigendum Number 1 item XSH/TC1/D6/12 is applied, correcting the XSI shaded text relating to the master side of a pseudo-terminal. The reason for the change is that the behavior of pseudo-terminals and regular terminals should be as much alike as possible in this case; the change achieves that and matches historical behavior.

### CLOSELOG

Technical Corrigendum Number 1 item XSH/TC1/D6/13 is applied, correcting the EXAMPLES.

### DLSYM

Technical Corrigendum Number 1 item XSH/TC1/D6/14 is applied, correcting an example and adding text to the RATIONALE describing issues related to conversion of pointers to functions and back again.

### EXEC

Technical Corrigendum Number 1 item XSH/TC1/D6/15 is applied, adding a new paragraph to the DESCRIPTION and text to the end of the APPLICATION USAGE section. This change addresses a security concern, where implementations may want to reopen file descriptors 0, 1, and 2 for programs with the `set-user-id` or `set-group-id` file mode bits calling the `exec` family of functions.

### EXIT

Technical Corrigendum Number 1 item XSH/TC1/D6/16 is applied, correcting grammar in the description.

### FORK

Technical Corrigendum Number 1 item XSH/TC1/D6/17 is applied, adding text to the DESCRIPTION and RATIONALE relating to fork handlers registered by the `pthread_atfork()` function and `async-signal` safety.

### FPATHCONF

Technical Corrigendum Number 1 item XSH/TC1/D6/18 is applied, changing the fourth paragraph of the DESCRIPTION and removing shading and margin markers from the table. This change is needed since implementations are required to support all these symbols.

### FREEADDRINFO

Technical Corrigendum Number 1 item XSH/TC1/D6/19 is applied, adding three notes to the DESCRIPTION and adding text to the APPLICATION USAGE related to the term canonical name. A reference to RFC 2181 is also added to the informative references front matter.

Technical Corrigendum Number 1 item XSH/TC1/D6/20 is applied, making changes for alignment with the IETF IPv6 API specification. These include the following: adding `AI_V4MAPPED`, `AI_ALL`, and `AI_ADDRCONFIG` to the allowed values for the `ai_flags` field; adding a description of `AI_ADDRCONFIG`; and adding a description of the consequences of ignoring the `AI_PASSIVE` flag.

### FSETPOS

Technical Corrigendum Number 1 item XSH/TC1/D6/21 is applied, deleting an erroneous `EINVAL` error case from the ERRORS section.

### GAI\_STRERROR

Technical Corrigendum Number 1 item XSH/TC1/D6/22 is applied, adding the `EAI_OVERFLOW` error code.

### GETNAMEINFO

Technical Corrigendum Number 1 item XSH/TC1/D6/23 is applied, making various changes in the SYNOPSIS and DESCRIPTION for alignment with the IETF IPv6 specification.

Technical Corrigendum Number 1 item XSH/TC1/D6/24 is applied, adding the `EAI_OVERFLOW` error to the ERRORS section.

### GETRLIMIT

Technical Corrigendum Number 1 item XSH/TC1/D6/25 is applied, changing wording for `RLIMIT_NOFILE` in the DESCRIPTION related to functions that allocate a file descriptor failing with `[EMFILE]`. Text is added to the APPLICATION USAGE section noting the consequences of a process attempting to set the hard or soft limit for `RLIMIT_NOFILE` less than the highest currently open file descriptor+1.

### GETSUBOPT

Technical Corrigendum Number 1 item XSH/TC1/D6/26 is applied, correcting an editorial error in the SYNOPSIS.

### GMTIME

Technical Corrigendum Number 1 item XSH/TC1/D6/27 is applied, adding the `E_OVERFLOW` error case.

### IF\_INDEXONAME

Technical Corrigendum Number 1 item XSH/TC1/D6/28 is applied, changing `{IFNAMSIZ}` to `{IF_NAMESIZ}` in the DESCRIPTION.

### INET\_NTOP

Technical Corrigendum Number 1 item XSH/TC1/D6/29 is applied, adding “the address must be in network byte order” to the end of the fourth sentence of the first paragraph in the DESCRIPTION.

### INITSTATE

Technical Corrigendum Number 1 item XSH/TC1/D6/30 is applied, removing `rand_r()` from the list of suggested functions in the APPLICATION USAGE section.

### LOCALECONV

Technical Corrigendum Number 1 item XSH/TC1/D6/31 is applied, removing references to “`int_curr_symbol`” and updating the descriptions of `p_sep_by_space` and `n_sep_by_space`. These changes are for alignment with the ISO C standard.

### LOCALTIME

Technical Corrigendum Number 1 item XSH/TC1/D6/32 is applied, adding the `E_OVERFLOW` error case.

### MAKECONTEXT

Technical Corrigendum Number 1 item XSH/TC1/D6/33 is applied, clarifying that the arguments passed to `func` are of type `int`.

**MMAP**

Technical Corrigendum Number 1 item XSH/TC1/D6/34 is applied, changing the margin code in the SYNOPSIS from MF|SHM to MC3 (notation for MF|SHM|TYM).

**MODF**

Technical Corrigendum Number 1 item XSH/TC1/D6/35 is applied, correcting the code example in the APPLICATION USAGE.

**MUNMAP**

Technical Corrigendum Number 1 item XSH/TC1/D6/36 is applied, changing the margin code in the SYNOPSIS from MF|SHM to MC3 (notation for MF|SHM|TYM).

**NANOSLEEP**

Technical Corrigendum Number 1 item XSH/TC1/D6/37 is applied, updating the SEE ALSO to include the `clock_nanosleep()` function.

**POW**

Technical Corrigendum Number 1 item XSH/TC1/D6/42 is applied, correcting the third paragraph in the RETURN VALUE section.

**PTHREAD\_ATTR\_GETSTACKSIZE**

Technical Corrigendum Number 1 item XSH/TC1/D6/43 is applied, correcting the margin code in the SYNOPSIS from TSA to TSS and updating the CHANGE HISTORY from “Thread Stack Address Attribute option” to “Thread Stack Size Attribute option.”

**PTHREAD\_CREATE**

Technical Corrigendum Number 1 item XSH/TC1/D6/44 is applied, adding text that the alternate stack is not inherited.

**PTHREAD\_RWLOCK\_DESTROY**

Technical Corrigendum Number 1 item XSH/TC1/D6/45 is applied, adding APPLICATION USAGE relating to priority inversion.

**PUTENV**

Technical Corrigendum Number 1 item XSH/TC1/D6/48 is applied, clarifying wording in the DESCRIPTION and adding a new paragraph into APPLICATION USAGE referring readers to `exec`.

**QSORT**

Technical Corrigendum Number 1 item XSH/TC1/D6/49 is applied, adding to the last sentence to the end of the first non-shaded paragraph in the DESCRIPTION and adding the two following paragraphs. The RATIONALE section is also updated. These changes are for alignment with the ISO C standard.

**REaddir**

Technical Corrigendum Number 1 item XSH/TC1/D6/50 is applied, replacing the EXAMPLES section with a new example.

**REALPATH**

Technical Corrigendum Number 1 item XSH/TC1/D6/51 is applied, adding new text to the DESCRIPTION for the case when `resolved_name` is a null pointer, changing the EINTR error case text, adding RATIONALE text, and the FUTURE DIRECTIONS text.

**SCHED\_GET\_PRIORITY\_MAX**

Technical Corrigendum Number 1 item XSH/TC1/D6/52 is applied, changing the PS margin code in the SYNOPSIS to PS|TPS.

**SCHED\_RR\_GET\_INTERVAL**

Technical Corrigendum Number 1 item XSH/TC1/D6/53 is applied, changing the PS margin code in the SYNOPSIS to PS|TPS.

**SEM\_GETVALUE**

Technical Corrigendum Number 1 item XSH/TC1/D6/54 is applied.

**SETENV**

Technical Corrigendum Number 1 item XSH/TC1/D6/55 is applied, adding references to `exec` in the APPLICATION USAGE and SEE ALSO sections.

**SETPGID**

Technical Corrigendum Number 1 item XSH/TC1/D6/56 is applied, changing the wording in the DESCRIPTION from “the process group ID of the indicated process shall be used” to “the process ID of the indicated process shall be used.” This change reverts the wording to as in IEEE Std 1003.1-1996; it appeared to be an unintentional change.

**SIGACTION**

Technical Corrigendum Number 1 item XSH/TC1/D6/57 is applied, changing descriptive text in the table describing the `sigaction` structure.

**SIGALTSTACK**

Technical Corrigendum Number 1 item XSH/TC1/D6/58 is applied, updating the first sentence to include “<Q>for the current thread</Q>” at the end.

**SIGINTERRUPT**

Technical Corrigendum Number 1 item XSH/TC1/D6/59 is applied, correcting the declaration in the sample implementation given in the DESCRIPTION section.

**STRFTIME**

Technical Corrigendum Number 1 item XSH/TC1/D6/60 is applied.

**STRTOD**

Technical Corrigendum Number 1 item XSH/TC1/D6/61 is applied, correcting the second paragraph in the RETURN VALUE section. This change makes it clear the sign of the return value.

**SYSCONF**

Technical Corrigendum Number 1 item XSH/TC1/D6/62 is applied, updating the DESCRIPTION to denote that the `_PC*` and `_SC*` symbols are now required to be supported. A corresponding change has been made in the Base Definitions volume. The deletion in the second paragraph removes some duplicated text. The additions add some symbols drawn from the standard that were accidentally omitted from this page.

Technical Corrigendum Number 1 item XSH/TC1/D6/63 is applied, making it clear in the RETURN VALUE that the value returned for `sysconf(_SC_OPEN_MAX)` may change if a call to `setrlimit()` adjusts the `RLIMIT_NOFILE` soft limit.

**TAN**

Technical Corrigendum Number 1 item XSH/TC1/D6/64 is applied, correcting the last paragraph in the RETURN VALUE section.

**TGAMMA**

Technical Corrigendum Number 1 item XSH/TC1/D6/65 is applied, correcting the third paragraph in the RETURN VALUE section.

**WCSTOD**

Technical Corrigendum Number 1 item XSH/TC1/D6/66 is applied, correcting the second paragraph in the RETURN VALUE section.

## RATIONALE CHANGES RELATED TO THE SYSTEM INTERFACES

**B.2.2.2**

Add to end of B.2.2.2

Technical Corrigendum Number 1 item XSH/TC1/D6/2 is applied, deleting the entries `POSIX_`, `_POSIX_`, and `posix_` from the column of allowed namespace prefixes for use by an implementation in the first table. The presence of these prefixes was contradicting later text that states “The pre-

fixes `posix_`, `POSIX_`, and `_POSIX` are reserved for use by IEEE Std 1003.1-2001 and other POSIX standards. Implementations may add symbols to the headers shown in the following table, provided the identifiers . . . do not use the reserved prefixes `posix_`, `POSIX_`, or `_POSIX`.”

Technical Corrigendum Number 1 item XSH/TC1/D6/3 is applied, correcting the reserved macro prefix from “`PRI[a-z],SCN[a-z]`” to “`PRI[Xa-z],SCN[Xa-z]`” in the second table. The change was needed since the C Standard allows implementations to define macros of the form “`PRI`” or “`SCN`” followed by any lowercase letter or “`X`” in `<inttypes.h>` (ISO/IEC 9899:1999 P400, Sub-clause 7.26.4.).

Technical Corrigendum Number 1 item XSH/TC1/D6/4 is applied, adding a new section listing reserved names for the `<stdint.h>` header. This change was for alignment with the C standard.

#### B.2.4.3

Add to the end of B2.4.3.

Technical Corrigendum Number 1 item XSH/TC1/D6/5 is applied, reordering the RTS shaded text under the third and fourth paragraphs of the `SIG_DFL` description. This corrects an earlier editorial error in this section.

Technical Corrigendum Number 1 item XSH/TC1/D6/6 is applied, adding the `abort()` function to the list of `async-cancel-safe` functions.

#### B.2.8.3

Add new paragraph 2 before “Memory Locking” in 2.8.3.

Technical Corrigendum Number 1 item XSH/TC1/D6/7 is applied, correcting the shading and margin markers in the introduction to section 2.8.3.1.

#### B.2.9.5

Add to the end of B.2.9.5.

Technical Corrigendum Number 1 item XSH/TC1/D6/8 is applied, adding the `pselect()` function to the list of functions with Cancellation points.

## ISSUES RELATED TO SHELL AND UTILITIES

`BREAK`, `COLON`, `CONTINUE`, `DOT`, `EVAL`, `EXEC`, `EXIT`, `EXPORT`, `READONLY`, `RETURN`, `SET`, `SHIFT`, `TRAP`, `UNSET`

Technical Corrigendum Number 1 item XCU/TC1/D6/5 is applied, so that the manual page sections use terms as described in the Utility Description Defaults. No change in behavior is intended.

#### EXPORT

Technical Corrigendum Number 1 item XCU/TC1/D6/6 is applied, adding the following text to the end of the first paragraph of the DESCRIPTION:

“If the name of a variable is followed by `=word`, then the value of that variable shall be set to *word*.”

The reason for this change was that the SYNOPSIS for `export` includes `export name[=word]`. . . but the meaning of the optional “`=word`” is never explained in the text.

#### READONLY

Technical Corrigendum Number 1 item XCU/TC1/D6/7 is applied, adding the following text to the end of the first paragraph of the DESCRIPTION:

“If the name of a variable is followed by `=word`, then the value of that variable shall be set to *word*.”

The reason for this change was that the SYNOPSIS for `readonly` includes `readonly name[=word]`. . . but the meaning of the optional “`=word`” is never explained in the text.

#### SET

Technical Corrigendum Number 1 item XCU/TC1/D6/8 is applied, changing the square brackets in the example in RATIONALE to be in bold which is the typeface used for optional items.

#### TIMES

Technical Corrigendum Number 1 item XCU/TC1/D6/9 is applied,

changing text in the DESCRIPTION from:

“Write the accumulated user and system times for the shell and for all of its child processes . . .”

to:

“The times utility shall write the accumulated user and system times for the shell and for all of its child processes . . .”

#### AR

Technical Corrigendum Number 1 item XCU/TC1/D6/10 is applied, making corrections to the SYNOPSIS. The change was needed since the `-a`, `-b`, and `-i` options are mutually exclusive, and `posname` is required if any of these options is specified.

Technical Corrigendum Number 1 item XCU/TC1/D6/11 is applied, correcting the description of the two-byte trailer in RATIONALE that had missed out a back quote. The correct trailer is a back quote followed by a `<newline>`.

#### C99

Technical Corrigendum Number 1 item XCU/TC1/D6/12 is applied, correcting the EXTENDED DESCRIPTION section of `-l c` and `-l m`. Previously the text did not take into account the presence of the `c99` math headers.

Technical Corrigendum Number 1 item XCU/TC1/D6/13 is applied, changing the reference to the `libxnet` library to `libxnet.a`.

#### CD

Technical Corrigendum Number 1 item XCU/TC1/D6/14 is applied, changing the SYNOPSIS to make it clear that the `-L` and `-P` options are mutually exclusive.

#### CHGRP

Technical Corrigendum Number 1 item XCU/TC1/D6/15 is applied, changing the SYNOPSIS to make it clear that the `-h` and `-R` options are optional.

#### CHMOD

Technical Corrigendum Number 1 item XCU/TC1/D6/16 is applied, changing XSI shaded text in the EXTENDED DESCRIPTION from:

“The perm symbol `t` shall specify the `S_ISVTX` bit and shall apply to directories only. The effect when using it with any other file type is unspecified. It can be used with the who symbols `o`, `a`, or with no who symbol. It shall not be an error to specify a who symbol of `u` or `g` in conjunction with the perm symbol `t`; it shall be ignored for `u` and `g`.”

to:

“The perm symbol `t` shall specify the `S_ISVTX` bit. When used with a file of type directory, it can be used with the who symbol `a`, or with no who symbol. It shall not be an error to specify a who symbol of `u`, `g`, or `o` in conjunction with the perm symbol `t`, but the meaning of these combinations is unspecified. The effect when using the perm symbol `t` with any file type other than directory is unspecified.”

This change is to permit historical behavior.

#### CHOWN

Technical Corrigendum Number 1 item XCU/TC1/D6/17 is applied, changing the SYNOPSIS to make it clear that the -h and -R options are optional.

#### CP

Technical Corrigendum Number 1 item XCU/TC1/D6/18 is applied, correcting an error in the SEE ALSO section.

#### DATE

Technical Corrigendum Number 1 item XCU/TC1/D6/19 is applied, correcting the CHANGE HISTORY section.

#### DIFF

Technical Corrigendum Number 1 item XCU/TC1/D6/20 is applied, changing the STDOUT section. This changes the specification of “diff -c” so it agrees with existing practice when contexts contain zero lines or one line.

#### ECHO

Technical Corrigendum Number 1 item XCU/TC1/D6/21 is applied, so that the echo utility can accommodate historical BSD behavior.

#### ED

Technical Corrigendum Number 1 item XCU/TC1/D6/22 is applied, adding the text “Any line modified by the command list shall be unmarked.” to the G command. This change corresponds to a similar change made to the g command in the 2001 revision.

#### EX

Technical Corrigendum Number 1 item XCU/TC1/D6/23 is applied, correcting a URL.

#### FALSE

Technical Corrigendum Number 1 item XCU/TC1/D6/24 is applied, changing the STDERR section from “None” to “Not Used” for alignment with the Utility Description Defaults.

#### FILE

Technical Corrigendum Number 1 item XCU/TC1/D6/25 is applied, making major changes to address ambiguities raised in defect reports.

Technical Corrigendum Number 1 item XCU/TC1/D6/26 is applied, making it clear in the OPTIONS section that the -m, -d, and -M options do not comply with Guideline 11 of the utility Syntax Guidelines.

#### GETCONF

Technical Corrigendum Number 1 item XCU/TC1/D6/27 is applied, correcting the descriptions of path\_var and system\_var in the OPERANDS section.

#### GREP

Technical Corrigendum Number 1 item XCU/TC1/D6/28 is applied, correcting the examples using the grep -F option that did not match the normative description of the -F option.

#### ICONV

Technical Corrigendum Number 1 item XCU/TC1/D6/29 is applied, making changes to address inconsistencies with the iconv() function in the System Interfaces Volume.

#### LOCALE

Technical Corrigendum Number 1 item XCU/TC1/D6/30 is applied, correcting an editorial error in the STDOUT section.

#### M4

Technical Corrigendum Number 1 item XCU/TC1/D6/31 is applied, replacing the EXAMPLES section.

#### MAILX

Technical Corrigendum Number 1 item XCU/TC1/D6/32 is applied, applying a change to the EXTENDED DESCRIPTION, raised by IEEE PASC Interpretation 1003.2-1992 #122, which was overlooked in the revision.

#### OD

Technical Corrigendum Number 1 item XCU/TC1/D6/33 is applied, correcting the examples, which were using an undefined “-n” option that should have been “-N.”

#### PATCH

Technical Corrigendum Number 1 item XCU/TC1/D6/34 is applied, clarifying the way that the patch utility performs ifdef selection for the -D option.

#### PAX

Technical Corrigendum Number 1 item XCU/TC1/D6/35 is applied. This change, which adds the process ID of the pax process into certain fields, provides a method for the implementation to ensure that different instances of pax extracting a file named “/a/b/foo” will not collide when processing the extended header information associated with “foo.”

Technical Corrigendum Number 1 item XCU/TC1/D6/36 is applied, changing “-x B” to “-x pax” in the OPTIONS section.

#### STTY

Technical Corrigendum Number 1 item XCU/TC1/D6/37 is applied, applying IEEE PASC Interpretation 1003.2-1992 #133, fixing an error in the description of “stty nl.”

#### TEST

Technical Corrigendum Number 1 item XCU/TC1/D6/38 is applied, XSI margin marking and shading a line in the OPERANDS section referring to the use of parentheses as arguments to the test utility.

#### TRUE

Technical Corrigendum Number 1 item XCU/TC1/D6/39 is applied, replacing the terms “None” and “Default” from the STDERR and EXIT STATUS section with terms as defined in the Utility Description Defaults section.

#### UNIQ

Technical Corrigendum Number 1 item XCU/TC1/D6/40 is applied, adding LC\_COLLATE to the ENVIRONMENT VARIABLES section, and changing “the application shall ensure that” in the OUTPUT FILES section.

#### VI

Technical Corrigendum Number 1 item XCU/TC1/D6/41 is applied, adding “[count]” to the Synopsis for “[].”

Technical Corrigendum Number 1 item XCU/TC1/D6/42 is applied, adding “[count]” to the Synopsis for “[].”

## RATIONALE CHANGES RELATED TO THE SHELL AND UTILITIES

### XRAT SECTION C.1.9 UTILITY LIMITS

Add to the end of C.1.9.

Technical Corrigendum Number 1 item XCU/TC1/D6/2 is applied, deleting the entry for {POSIX2\_VERSION} since it is not a Utility Limit Minimum Value.

Technical Corrigendum Number 1 item XCU/TC1/D6/3 is applied, changing the text in Utility Limits from:

“utility (see getconf (on page 481)) and through the sysconf() function defined in the System Interfaces volume of IEEE Std 1003.1-2001. The literal names shown in Table 1-3 (on page 17) apply only to the getconf utility; the high-level language binding describes the

exact form of each name to be used by the interfaces in that binding.”

to:

“utility (see `getconf` (on page 481)).”

C.

Add to the end of C.2.6.3

Technical Corrigendum Number 1 item XCU/TC1/D6/4 is applied, changing the text from:

“If a command substitution occurs inside double-quotes, it shall not be performed on the results of the substitution.”

to:

“If a command substitution occurs inside double-quotes, field splitting and pathname expansion shall not be performed on the results of the substitution.”

The replacement text taken from POSIX.2-1992 is clearer about the items that are not performed.

## Austin Group Status Update

APRIL 15, 2003

by Andrew Josey

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Since the last status update, we are pleased to report Technical Corrigendum 1 to the Austin Group Specifications has been approved by all the sponsoring bodies – the IEEE-SA, The Open Group, and ISO/IEC.

The Austin Group has recently published the 2003 edition of its specifications incorporating Technical Corrigendum 1. The designation for this edition is IEEE Std 1003.1, 2003 Edition, ISO/IEC 9945:2003 and form the core of the 2003 edition of the Single UNIX Specification Version 3.

HTML copies of the specification can be freely downloaded or read online at <http://www.unix-systems.org/version3/>. USENIX members who would like a PDF copy should send an email request to Andrew Josey.

Text of Technical Corrigendum 1 (the list of changes to the 2001 edition of the Austin Group specification) is freely available from <http://www.opengroup.org/corrigenda/>.

## LSB Certification News 1Q2003

APRIL 15, 2003

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The Open Group has certified the following products to the LSB Specifications during 1Q 2003:

Date	Company	Product
06-Jan-03	Red Hat, Inc,	Red Hat Linux Advanced Server 2.1 with updates
07-Jan-03	Sun Wah Linux Ltd	Sun Wah Linux Desktop 3.0
07-Jan-03	Turbo Linux Inc	Turbolinux Enterprise Server 8 powered by UnitedLinux
15-Jan-03	Conectiva Inc.	Conectiva Linux Enterprise Edition Powered by UnitedLinux v1.0
24-Mar-03	SuSE Linux AG	UnitedLinux 1.0
24-Mar-03	SuSE Linux AG	SuSE Linux 8.2
28-Mar-03	SuSE Linux AG	SuSE Linux Enterprise Server 8 for IPF powered by UnitedLinux
01-Apr-03	Red Hat, Inc.	Red Hat Linux 9

As of April 15, 2003, there are nineteen LSB certified products.

The full register of certified products is available at <http://www.opengroup.org/lsb/cert/register.html>.

For more information LSB Certification, please see <http://www.opengroup.org/lsb/cert/>.

## Standards Briefing: The Linux Standard Base (LSB)

APRIL 15, 2003

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In this article we introduce the Linux Standard Base, the specification, and certification programs.

### THE LSB SPECIFICATION

The Linux Standard Base (LSB) Specification is an application binary interface standard for shrink-wrapped applications. The LSB draws on the source standards of IEEE POSIX 1003.1-1990 and The Open Group Single UNIX Specification Version 2 for

many of its interfaces, although it does not formally defer to them, preferring to document any differences where they exist. It also extends the source standards in other areas (such as graphics) and includes the necessary details such as the binary execution file formats to support a high-volume application platform.

Although in theory the LSB is not tied to the GNU/Linux operating system, in practice the binary definitions are tightly coupled to Linux and the GNU C compiler.

The LSB is available as a family of specifications supporting a number of processor architectures, including IA32, PPC32, and IA64. There is a generic specification, common to all the processor architectures, known as the “generic LSB” (or gLSB), and for each processor architecture an architecture-specific specification (“archLSB”) describing the details that vary by processor architecture.

The specification is evolving quite rapidly. LSB 1.3, introduced in January 2003, adds internationalization, PAM, packaging, static C++ linking, bug fixes, plus IA64, PPC32, and soon PPC64, S390, S390X, and maybe Hammer. LSB 2.0 is planned for January 2004.

To support the specification, the LSB includes a number of development tools, including test suites, and a set of reference conforming applications. Binary versions of the test suites and reference applications are used for formal LSB certification of runtime environments. All the major Linux vendors today have certified LSB systems.

## LSB CERTIFICATION

The LSB certification program is a voluntary program of the Free Standards Group, open to any product meeting the conformance requirements. It is not restricted to Linux-based systems or Linux-based applications, although in practice it does lean toward requiring use of glibc.

It is a formal process built around a policy document and a trademark license agreement. Suppliers of certified products, warrant and represent that the product meets all the conformance requirements applicable to the class of LSB Certification being certified.

LSB certification currently covers the following specifications:\*

- The Linux Standard Base Specification 1.3
- The Linux Standard Base Specification for IA32 1.3
- The Linux Standard Base Specification for PPC32 1.3
- The Linux Standard Base Specification for IA64 1.3
- The OpenI18N Specification (formally the Li18nux 2000 Globalization Specification Version 1.0 with Amendment 4)

\*Note that LSB 1.2 certification was withdrawn on April 18 2003.

LSB 1.2, introduced in January 2002, was the first version of the specification to have an equivalent LSB certification program. LSB 1.2 certification, which commenced in July 2002, is limited to the IA32 ABI. LSB 1.3 certification was introduced in January 2003 and adds support for PPC32 and IA64. At the time of writing, there are nineteen runtime environments from nine vendors.

## MORE INFORMATION

Detailed information on the LSB is available from <http://www.linuxbase.org>.

Detailed information on the LSB Certification Program is available from the LSB Certification Authority at <http://www.opengroup.org/lsb/cert/>.

The Guide to LSB Certification is available at [http://www.opengroup.org/lsb/cert/docs/LSB\\_Certification\\_Guide.html](http://www.opengroup.org/lsb/cert/docs/LSB_Certification_Guide.html).

The LSB Certification Register can be viewed at <http://www.opengroup.org/lsb/cert/register.html>.