SOFTWARE COMMUNICATIONS ARCHITECTURE SPECIFICATION

APPENDIX B: SCA APPLICATION ENVIRONMENT PROFILES

20 August 2015
Version: 4.1

Prepared by:

Joint Tactical Networking Center (JTNC)
33000 Nixie Way
San Diego, CA 92147-5110

REVISION HISTORY

Version	Revision	Date
Next <Draft>	Initial Draft Release	30 November 2010
Next <Draft> 1.0.0.2	Applied SCA Next Errata Sheet v2.0	14 September 2011
Candidate Release	Initial Release	27 December 2011
4.0	ICWG Approved Release	28 February 2012
4.0.1	Incorporated transition to JTNC and applied SCA 4.0 Errata Sheet v1.0	01 October 2012
4.1<DRAFT>	Incorporated Lw & ULw AEPs	31 December 2014
4.1	Administrative: Moved C Language-Specific sections to new level 3 subsection Technical: Mandated errno POSIX function and Standard C Library Header Files (i.e. stdbool.h, stdint.h and stddef.h) in Full AEP Profile. Also mandated stddef.h in Lightweight AEP Profile. Mandated POSIX option {_POSIX_THREAD_PRIO_INHERIT} in Lightweight and Ultra-Lightweight AEP Profiles. **ICWG Approved**	20 August 2015

TABLE OF CONTENTS

TABLE OF TABLES

APPENDIX B SCA APPLICATION ENVIRONMENT PROFILES

B.1 SCOPE

This appendix defines the Application Environment Profile (AEP), Lightweight AEP (LwAEP) and Ultra-Lightweight (ULwAEP) for the SCA, based on POSIX Realtime AEP [1].

This appendix also extends the SCA AEP with networking capabilities for SCA compliant applications that require this functionality.

The SCA AEP, LwAEP and ULwAEP are the profiles referenced in the SCA specification. The SCA dictates that an Operating Environment (OE) provides the options and functions designated as mandatory within the supported profile and constrains an application to only use those services.

The technical content pertaining to the LwAEP and ULwAEP profiles within this appendix is closely aligned with the corresponding profiles defined within the Wireless Innovation Forum POSIX profile specification [5]. Section 6 of that specification provides the rationale for the LwAEP and ULwAEP profile recommendations provided within this appendix.

B.2 CONFORMANACE

B.2.1 AEP Conformance on the Part of an SCA Product

The elements of this specification are not required to be used solely for a particular platform or application. This specification identifies the collection of Operating System (OS) services that are available for use by an ApplicationComponent. However for an OE this specification identifies the minimum set of OS services that must be supported.

Conformance for an SCA Product is at the level of usage as follows:

- An SCA Product needs to be conformant with the mandatory elements of a Profile defined within this Appendix.

The networking capabilities (i.e. networking and event management function behavior) are outside of the scope of the defined profiles. AEP (only) conformance for an SCA Product may be extended to incorporate the networking capabilities as follows:

- An AEP conformant SCA Product needs to be conformant with the mandatory elements of the networking capabilities defined within this Appendix.

B.2.2 Sample Conformance Statements

An SCA Product can be identified as being conformant to a specific version of the SCA and the specific technology that the product realizes.

- "Product A is an SCA conformant waveform application in accordance with the LwAEP and the CORBA Platform Specific Model (PSM) found in APPENDIX E-2."
- "Product B is an SCA conformant OE in accordance with an AEP POSIX layer with networking and a CORBA PSM found in APPENDIX E-2 (full profile) transfer mechanism."

- "Product C is an SCA conformant OE in accordance with a LwAEP POSIX layer and a CORBA PSM found in APPENDIX E-2 (full profile) transfer mechanism."

B.3 CONVENTIONS

Within this appendix, the following abbreviations are used:

1. "MAN" indicates that the identified function or option is mandatory for the indicated profile;
2. "NRQ" indicates that the identified function or option is not required for the indicated profile;
3. "PRT" indicates that only a subset of the indicated option or unit of functionality is required. This designation will be followed by a note or cross-reference indicating which elements are required.

Compliance with this appendix may be viewed from two perspectives: OE and application. To be evaluated as compliant an OE must provide all features marked as MAN and the indicated subset of those marked PRT. The OE may optionally provide those marked as NRQ. A compliant ApplicationComponent may use any feature marked as MAN or the indicated subset of those marked PRT. An ApplicationComponent may not use any feature marked as NRQ. An ApplicationComponent developed in accordance with the LwAEP or ULwAEP may use operations designated as MAN in the AEP if it provides an implementation of those features (i.e. the component cannot depend on the OE to provide the functionality).

B.4 NORMATIVE REFERENCES

N/A

B.5 INFORMATIVE REFERENCES

The following is a list of documents referenced within this appendix or used as reference or guidance material in its development.

[1] IEEE Standard for Information Technology— Standardized Application Environment Profile (AEP)—POSIX® Realtime and Embedded Application Support, IEEE Std 1003.13™-2003, 10 September 2004

[2] Information technology — POSIX® Ada Language Interfaces — Binding for System Application Program Interface (API), ISO/IEC 14519:2001, December 2001.

[3] Programming languages — C, ISO/IEC 9899:1999, 01 December 1999.

[4] Information technology -- Portable Operating System Interface (POSIX®) Base Specifications, Issue 7 ISO/IEC 9945-1:2009,

[5] Lw and ULw POSIX AEPs for Resource Constrained Processors, Version V0.4.0, WINNF-14-S-0009, 17-June-2014

B.6 CONSTRAINTS

The real-time profile defined in this appendix requires only specific Units of Functionality of the included standards. The absence of particular elements of these standards introduces constraints on the use of some of the features of particular functions. These constraints must be observed by an application that conforms to the profile when using each of the required functions.

An Ada AEP has not been explicitly defined. SCA471 Any Ada application shall be restricted to using the equivalent Ada functionality, as defined in POSIX Ada language binding [2], designated as mandatory by the target profile or may use the C interface defined in [3].

The presence of a full-featured Real-Time Operating System (RTOS) in the embedded processor may offer software life cycle cost benefits. The LwAEP and ULwAEP provide the SCA with subsets of the AEP that are applicable for a more constrained target platform.

B.6.1 POSIX.1

SCA473 The options, limits, and any other constraints on POSIX.1 [1] shall be provided as described in **Table 1**.

Table 1: POSIX.1 Option Requirements

Option	AEP	LwAEP	ULwAEP
{_POSIX_ASYNCHRONOUS_IO}	MAN	NRQ	NRQ
{_POSIX_CHOWN_RESTRICTED}	NRQ	NRQ	NRQ
{_POSIX_CLOCK_SELECTION}	NRQ	NRQ	NRQ
{_POSIX_FSYNC}	MAN[1]	NRQ	NRQ
{_POSIX_MAPPED_FILES}	NRQ	NRQ	NRQ
{_POSIX_MEMLOCK_RANGE}	MAN	NRQ	NRQ
{_POSIX_MEMLOCK}	MAN	NRQ	NRQ
{_POSIX_MEMORY_PROTECTION}	NRQ	NRQ	NRQ
{_POSIX_MESSAGE_PASSING}	MAN	PRT	PRT
{_POSIX_MONOTONIC_CLOCK}	NRQ	NRQ	NRQ
{_POSIX_NO_TRUNC}	PRI	NRQ	NRQ
{_POSIX_PRIORITIZED_IO}	NRQ	NRQ	NRQ
{_POSIX_PRIORITY_SCHEDULING}	NRQ	NRQ	NRQ
{_POSIX_REALTIME_SIGNALS}	MAN	NRQ	NRQ
{_POSIX_SAVED_IDS}	NRQ	NRQ	NRQ
{_POSIX_SEMAPHORES}	MAN	MAN	MAN
{_POSIX_SHARED_MEMORY_OBJECTS}	NRQ	NRQ	NRQ
{_POSIX_SYNCHRONIZED_IO}	MAN[2]	NRQ	NRQ

[1] fsync not required

Option	AEP	LwAEP	ULwAEP
{_POSIX_THREAD_ATTR_STACKADDR}	MAN	MAN	MAN
{_POSIX_THREAD_ATTR_STACKSIZE}	MAN	MAN	MAN
{_POSIX_THREAD_CPUTIME}	NRQ	NRQ	NRQ
{_POSIX_THREAD_PRIO_INHERIT}	MAN	MAN	MAN
{_POSIX_THREAD_PRIO_PROTECT}	MAN	NRQ	NRQ
{_POSIX_THREAD_PRIORITY_SCHEDULING}	MAN	MAN	MAN
{_POSIX_THREAD_PROCESS_SHARED}	NRQ	NRQ	NRQ
{_POSIX_THREAD_SAFE_FUNCTIONS}	MAN[3]	NRQ	NRQ
{_POSIX_THREAD_SPORADIC_SERVER}	NRQ	NRQ	NRQ
{_POSIX_TIMEOUTS}	MAN	MAN	MAN
{_POSIX_TIMERS}	MAN	MAN	MAN
{_POSIX_TRACE_EVENT_FILTER}	NRQ	NRQ	NRQ
{_POSIX_TRACE_LOG}	NRQ	NRQ	NRQ
{_POSIX_TRACE}	NRQ	NRQ	NRQ
{_POSIX_VDISABLE}	NRQ	NRQ	NRQ

NOTES:

- PRI - The primary file system generates an error for pathname components longer than NAME_MAX. The user is responsible for semantics of other file systems that may be mounted.
- Embedded processor C/C++ run-time [1] libraries typically do not support stdio.h or iostream.h.
- Heavy weight processes are typically not supported in embedded operating systems. The mandatory POSIX.1b [1] options can be implemented without the use of heavy weight signaling.

B.6.1.1 POSIX Message Queues Function Behavior

SCA537 The functions listed in **Table 2** shall behave as described in the applicable clauses of the referenced POSIX [4].

Table 2: POSIX_MQUEUE Functions

Function	AEP	LwAEP	ULwAEP
mq_close()	MAN	NRQ	NRQ
mq_getattr()	MAN	NRQ	NRQ
mq_notify()	MAN	NRQ	NRQ
mq_open()	MAN	MAN	MAN[4]

[2] fdatasync not required
[3] See Table 20: POSIX_THREAD_SAFE_FUNCTIONS Functions

Function	AEP	LwAEP	ULwAEP
mq_receive()	MAN	MAN	MAN
mq_send()	MAN	MAN	MAN
mq_setattr()	MAN	NRQ	NRQ
mq_timedreceive()	NRQ	NRQ	NRQ
mq_timedsend()	NRQ	NRQ	NRQ
mq_unlink()	MAN	NRQ	NRQ

NOTE:

- The use of POSIX Message Queue functionality is restricted to intra-process communications. For processing elements (e.g. DSP) that do not support process partitioning the use of POSIX Message Queue functionality is limited to task to task (also referred to threads) communications.

B.6.1.2 Single Process Function Behavior

SCA475 The functions in **Table 3** shall behave as described in the applicable clauses of POSIX [4].

Table 3: POSIX_SINGLE_PROCESS Functions

Function	AEP	LwAEP	ULwAEP
confstr()	NRQ	NRQ	NRQ
environ	NRQ	NRQ	NRQ
errno	MAN	NRQ	NRQ
getenv()	NRQ	NRQ	NRQ
setenv()	NRQ	NRQ	NRQ
sysconf()	NRQ	NRQ	NRQ
uname()	NRQ	NRQ	NRQ
unsetenv()	NRQ	NRQ	NRQ

B.6.1.3 Multi Process Function Behavior

SCA476 The functions listed in **Table 4** shall behave as described in the applicable clauses of POSIX [4].

Table 4: POSIX_MULTI_PROCESS Functions

Function	AEP	LwAEP	ULwAEP
_exit()	NRQ	NRQ	NRQ
_Exit()	NRQ	NRQ	NRQ
assert()	NRQ	NRQ	NRQ

[4] Priorities are not supported and size is limited to sizeof(void *)

Function	AEP	LwAEP	ULwAEP
atexit()	NRQ	NRQ	NRQ
clock()	NRQ	NRQ	NRQ
execl()	NRQ	NRQ	NRQ
execle()	NRQ	NRQ	NRQ
exexlp()	NRQ	NRQ	NRQ
execv()	NRQ	NRQ	NRQ
execve()	NRQ	NRQ	NRQ
execvp()	NRQ	NRQ	NRQ
exit()	NRQ	NRQ	NRQ
fork()	NRQ	NRQ	NRQ
getpgrp()	NRQ	NRQ	NRQ
getpid()	NRQ	NRQ	NRQ
getppid()	NRQ	NRQ	NRQ
setsid()	NRQ	NRQ	NRQ
sleep()	NRQ	NRQ	NRQ
times()	NRQ	NRQ	NRQ
wait()	NRQ	NRQ	NRQ
waitpid()	NRQ	NRQ	NRQ

B.6.1.4 Job Control Function Behavior

SCA477 The functions listed in **Table 5** shall behave as described in the applicable clauses of POSIX [4].

Table 5: POSIX_JOB_CONTROL Functions

Function	AEP	LwAEP	ULwAEP
setpgid()	NRQ	NRQ	NRQ
tcgetpgrp()	NRQ	NRQ	NRQ
tcsetpgrp()	NRQ	NRQ	NRQ

B.6.1.5 Signals Function Behavior

Operating systems on embedded processors typically do not support signaling or exception handling. POSIX does not define behaviors associated with divide by zero or overflow / underflow. Signaling methods introduced as part of POSIX.1c [1] are more consistent with the multi-threaded, single process model of a resource constrained processing environment.

SCA478 The functions listed in **Table 6** shall behave as described in the applicable clauses of POSIX [4]. The absence of particular elements of the POSIX standards introduces constraints on

the use of some of the features of particular operations. The following sentences identify constraints which an application must observe when using the operations required by the AEP.

There are two kinds of process termination in POSIX [4]:

1. Normal termination occurs by a return from *main()* or when requested with the *exit()* or *_exit()* functions.
2. Abnormal termination occurs when requested by the *abort()* function or when some signals are received.

An application which is executing within a single process system will be considered erroneous (i.e. improperly coded) if any received signal results in abnormal termination of the process[5].

An application should not call the *kill()* function with a negative pid argument unless the negative argument is -1 because the AEP does not require process group functionality.

Table 6: POSIX_SIGNALS Functions

Function	AEP	LwAEP	ULwAEP
abort()[6]	MAN	NRQ	NRQ
alarm()[7]	NRQ	NRQ	NRQ
kill()	MAN	NRQ	NRQ
pause()	MAN	NRQ	NRQ
raise()	MAN	NRQ	NRQ
sigaction()	MAN	NRQ	NRQ
sigaddset()	MAN	NRQ	NRQ
sigdelset()	MAN	NRQ	NRQ
sigemptyset()	MAN	NRQ	NRQ
sigfillset()	MAN	NRQ	NRQ
sigismember()	MAN	NRQ	NRQ
signal()	MAN	NRQ	NRQ
sigpending()	MAN	NRQ	NRQ
sigprocmask()	MAN	NRQ	NRQ
sigsupend()	MAN	NRQ	NRQ
sigwait()	MAN	NRQ	NRQ

[5] See POSIX.1c [1] Chapter 13, "*signals.h*" header file for a list of signals whose default actions result in abnormal termination.
[6] abort() is used to support assert() which is widely supported
[7] functionality provided through the POSIX timers

B.6.1.6 Signal Jump Function Behavior

SCA480 The functions listed in **Table 7** shall behave as described in the applicable clauses of POSIX [4].

Table 7: POSIX_SIGNAL_JUMP Functions

Function	AEP	LwAEP	ULwAEP
siglongjmp()	NRQ	NRQ	NRQ
sigsetjmp()	NRQ	NRQ	NRQ

B.6.1.7 User Group Function Behavior

SCA481 The functions listed in **Table 8** shall behave as described in the applicable clauses of POSIX [4].

Table 8: POSIX_USER_GROUPS Functions

Function	AEP	LwAEP	ULwAEP
getegid()	NRQ	NRQ	NRQ
geteuid()	NRQ	NRQ	NRQ
getgid()	NRQ	NRQ	NRQ
getgroups()	NRQ	NRQ	NRQ
getlogin()	NRQ	NRQ	NRQ
getlogin_r()	NRQ	NRQ	NRQ
getuid()	NRQ	NRQ	NRQ
setegid()	NRQ	NRQ	NRQ
seteuid()	NRQ	NRQ	NRQ
setgid()	NRQ	NRQ	NRQ
setuid()	NRQ	NRQ	NRQ

B.6.1.8 File System Function Behavior

SCA482 The functions listed in **Table 9** shall behave as described in the applicable clauses of POSIX [4].

Table 9: POSIX_FILE_SYSTEM Functions

Function	AEP	LwAEP	ULwAEP
access()	MAN	NRQ	NRQ
chdir()	MAN	NRQ	NRQ
closedir()	MAN	NRQ	NRQ
creat()	MAN	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
fpathconf()	MAN	NRQ	NRQ
fstat()	MAN	NRQ	NRQ
getcwd()	MAN	NRQ	NRQ
link()	MAN	NRQ	NRQ
mkdir()	MAN	NRQ	NRQ
opendir()	MAN	NRQ	NRQ
pathconf()	MAN	NRQ	NRQ
readdir()	MAN	NRQ	NRQ
readdir_r()	MAN	NRQ	NRQ
remove()	MAN	NRQ	NRQ
rename()	MAN	NRQ	NRQ
rewinddir()	MAN	NRQ	NRQ
rmdir()	MAN	NRQ	NRQ
stat()	MAN	NRQ	NRQ
tmpfile()	NRQ	NRQ	NRQ
tmpnam()	NRQ	NRQ	NRQ
unlink()	MAN	NRQ	NRQ
utime()	MAN	NRQ	NRQ

NOTE:

- POSIX file system not generally supported in embedded operating systems.

B.6.1.9 File Attributes Function Behavior

SCA483 The functions listed in **Table 10** shall behave as described in the applicable clauses of POSIX [4].

The file mode creation mask for any object created by any process should be S-IRWXU.

Table 10: POSIX_FILE_ATTRIBUTES Functions

Function	AEP	LwAEP	ULwAEP
chmod()	NRQ	NRQ	NRQ
chown()	NRQ	NRQ	NRQ
fchmod()	NRQ	NRQ	NRQ
fchown()	NRQ	NRQ	NRQ
umask()	NRQ	NRQ	NRQ

NOTE:

- POSIX file system not generally supported in embedded operating systems.

B.6.1.10 File and Directory Management Function Behavior

SCA484 The functions listed in **Table 11** shall behave as described in the applicable clauses of POSIX [4].

Table 11: POSIX_FD_MGMT Functions

Function	AEP	LwAEP	ULwAEP
dup()	NRQ	NRQ	NRQ
dup2()	NRQ	NRQ	NRQ
fcntl()	NRQ	NRQ	NRQ
fgetpos()	NRQ	NRQ	NRQ
fseek()	MAN	NRQ	NRQ
fseeko()	MAN	NRQ	NRQ
fsetpos()	NRQ	NRQ	NRQ
ftell()	MAN	NRQ	NRQ
ftello()	MAN	NRQ	NRQ
ftruncate()	NRQ	NRQ	NRQ
lseek()	MAN	NRQ	NRQ
rewind()	MAN	NRQ	NRQ

NOTE:

- POSIX file system not generally supported in embedded operating systems.

B.6.1.11 Device I/O Function Behavior

SCA485 The functions listed in **Table 12** shall behave as described in the applicable clauses of POSIX [4].

Table 12: POSIX_DEVICE_IO Functions

Function	AEP	LwAEP	ULwAEP
clearerr()	MAN	NRQ	NRQ
close()	MAN	MAN	NRQ
fclose()	MAN	NRQ	NRQ
fdopen()	MAN	NRQ	NRQ
feof()	MAN	NRQ	NRQ
ferror()	MAN	NRQ	NRQ
fflush()	MAN	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
fgetc()	MAN	NRQ	NRQ
fgets()	MAN	NRQ	NRQ
fileno()	MAN	NRQ	NRQ
fopen()	MAN	NRQ	NRQ
fprintf()	MAN	NRQ	NRQ
fputc()	MAN	NRQ	NRQ
fputs()	MAN	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
fread()	MAN	NRQ	NRQ
freopen()	MAN	NRQ	NRQ
fscanf()	MAN	NRQ	NRQ
fwrite()	MAN	NRQ	NRQ
getc()	MAN	NRQ	NRQ
getchar()	MAN	NRQ	NRQ
gets()	NRQ	NRQ	NRQ
open()	MAN	MAN	NRQ
perror()	MAN	NRQ	NRQ
printf()	MAN	NRQ	NRQ
putc()	MAN	NRQ	NRQ
putchar()	MAN	NRQ	NRQ
puts()	NRQ	NRQ	NRQ
read()	MAN	MAN	NRQ
scanf()	NRQ	NRQ	NRQ
setbuf()	MAN	NRQ	NRQ
setvbuf()	MAN	NRQ	NRQ
ungetc()	MAN	NRQ	NRQ
vfprintf()	NRQ	NRQ	NRQ
vfscanf()	NRQ	NRQ	NRQ
vprintf()	NRQ	NRQ	NRQ
vscanf()	NRQ	NRQ	NRQ
write()	MAN	MAN	NRQ

NOTE:

- POSIX streams not generally supported in embedded operating systems.

B.6.1.12 Device-Specific Function Behavior

SCA486 The functions listed in **Table 13** shall behave as described in the applicable clauses of POSIX [4].

Table 13: POSIX_DEVICE_SPECIFIC Functions

Function	AEP	LwAEP	ULwAEP
cfgetispeed()	NRQ	NRQ	NRQ
cfgetospeed()	NRQ	NRQ	NRQ
cfsetispeed()	NRQ	NRQ	NRQ
cfsetospeed()	NRQ	NRQ	NRQ
ctermid()	NRQ	NRQ	NRQ
isatty()	NRQ	NRQ	NRQ
tcdrain()	NRQ	NRQ	NRQ
tcflow()	NRQ	NRQ	NRQ
tcflush()	NRQ	NRQ	NRQ
tcgetattr()	NRQ	NRQ	NRQ
tcsendbreak()	NRQ	NRQ	NRQ
tcsetattr()	NRQ	NRQ	NRQ
ttyname()	NRQ	NRQ	NRQ
ttyname_r()	NRQ	NRQ	NRQ

B.6.1.13 System Database Function Behavior

SCA487 The functions listed in **Table 14** shall behave as described in the applicable clauses of POSIX [4].

Table 14: POSIX_SYSTEM_DATABASE Functions

Function	AEP	LwAEP	ULwAEP
getgrgid()	NRQ	NRQ	NRQ
getgrgid_r()	NRQ	NRQ	NRQ
getgrnam()	NRQ	NRQ	NRQ
getgrnam_r()	NRQ	NRQ	NRQ
getpwnam()	NRQ	NRQ	NRQ
getpwnam_r()	NRQ	NRQ	NRQ
getpwuid()	NRQ	NRQ	NRQ
getpwuid_r()	NRQ	NRQ	NRQ

B.6.1.14 Pipe Function Behavior

SCA488 The function listed in **Table 15** shall behave as described in the applicable clauses of POSIX [4].

Table 15: POSIX_PIPE_Function

Function	AEP	LwAEP	ULwAEP
pipe()	NRQ	NRQ	NRQ

B.6.1.15 FIFO Function Behavior

SCA489 The function listed in **Table 16** shall behave as described in the applicable clauses of POSIX [4].

Table 16: POSIX_FIFO Function

Function	AEP	LwAEP	ULwAEP
mkfifo()	NRQ	NRQ	NRQ

B.6.1.16 POSIX Semaphore Function Behavior

SCA465 The functions listed in **Table 17** shall behave as described in the applicable clauses of POSIX [4].

Table 17: POSIX_SEMAPHORES Functions

Function	AEP	LwAEP	ULwAEP
sem_close()	MAN	NRQ	NRQ
sem_destroy()	MAN	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
sem_getvalue()	MAN	MAN	NRQ
sem_init()	MAN	MAN	MAN
sem_open()	MAN	NRQ	NRQ
sem_post()	MAN	MAN	MAN
sem_timedwait()	MAN	NRQ	NRQ
sem_trywait()	MAN	NRQ	NRQ
sem_unlink()	MAN	NRQ	NRQ
sem_wait()	MAN	MAN	MAN

B.6.1.17 POSIX Timer Function Behavior

SCA466 The functions listed in **Table 18** shall behave as described in the applicable clauses of POSIX [4].

Table 18: POSIX_TIMERS Functions

Function	AEP	LwAEP	ULwAEP
clock_getres()	MAN	MAN	MAN
clock_gettime()	MAN	MAN	MAN
clock_settime()	MAN	NRQ	NRQ
nanosleep()	MAN	NRQ	NRQ
timer_create()	MAN	MAN[8]	MAN[9]
timer_delete()	MAN	NRQ	NRQ
timer_getoverrun()	MAN	NRQ	NRQ
timer_gettime()	MAN	MAN	NRQ
timer_settime()	MAN	MAN	MAN

B.6.1.18 POSIX Threading Function Behavior

SCA467 The functions listed in **Table 19** shall behave as described in the applicable clauses of POSIX [4].

Table 19: POSIX_THREADS_BASE Functions

Function	AEP	LwAEP	ULwAEP
pthread_atfork()	NRQ	NRQ	NRQ

[8] The timer expiration conditions may use either SIGEV_THREAD or an implementation specific mechanism.
[9] The timer expiration conditions may use either SIGEV_THREAD or an implementation specific mechanism.

Function	AEP	LwAEP	ULwAEP
pthread_attr_init()	MAN	MAN	MAN
pthread_attr_destroy()	MAN	MAN	NRQ
pthread_attr_getdetachstate()	MAN	NRQ	NRQ
pthread_attr_getschedparam()	MAN	MAN	NRQ
pthread_attr_setdetachstate()	MAN	MAN[10]	MAN[11]
pthread_attr_setschedparam()	MAN	MAN	MAN
pthread_cancel()	MAN	NRQ	NRQ
pthread_cleanup_pop()	MAN	NRQ	NRQ
pthread_cleanup_push()	MAN	NRQ	NRQ
pthread_cond_ broadcast()	MAN	MAN	NRQ
pthread_cond_destroy()	MAN	MAN	NRQ
pthread_cond_init()	MAN	MAN	NRQ
pthread_cond_signal()	MAN	MAN	NRQ
pthread_cond_timedwait()	MAN	NRQ	NRQ
pthread_cond_wait()	MAN	MAN	NRQ
pthread_condattr_destroy()	MAN	NRQ	NRQ
pthread_condattr_init()	MAN	NRQ	NRQ
pthread_create()	MAN	MAN	MAN
pthread_detach()	MAN	NRQ	NRQ
pthread_equal()	MAN	NRQ	NRQ
pthread_exit()	MAN	NRQ	NRQ
pthread_getschedparam()	MAN	NRQ	NRQ
pthread_getspecific()	MAN	NRQ	NRQ
pthread_join()	MAN	NRQ	NRQ
pthread_key_create()	MAN	NRQ	NRQ
pthread_key_delete()	MAN	NRQ	NRQ
pthread_kill()	MAN	NRQ	NRQ
pthread_mutex_destroy()	MAN	NRQ	NRQ
pthread_mutex_init()	MAN	MAN	MAN
pthread_mutex_lock()	MAN	MAN	MAN
pthread_mutex_trylock()	MAN	NRQ	NRQ

[10] The detachstate attribute is always equal to PTHREAD_CREATE_DETACHED.
[11] The detachstate attribute is always equal to PTHREAD_CREATE_DETACHED.

Function	AEP	LwAEP	ULwAEP
pthread_mutex_unlock()	MAN	MAN	MAN
pthread_mutexattr_destroy()	MAN	MAN	NRQ
pthread_mutexattr_init()	MAN	MAN	MAN
pthread_once()	MAN	NRQ	NRQ
pthread_self()	MAN	MAN	MAN
pthread_setcancelstate()	MAN	NRQ	NRQ
pthread_setcanceltype()	MAN	NRQ	NRQ
pthread_setschedparam()	MAN	NRQ	NRQ
pthread_setspecific()	MAN	NRQ	NRQ
pthread_sigmask()	MAN	NRQ	NRQ
pthread_testcancel()	MAN	NRQ	NRQ

B.6.1.19 POSIX Thread Safe Option Requirements Behavior

SCA468 The function listed in **Table 20** shall behave as described in the referenced clause.

Table 20: POSIX_THREAD_SAFE_FUNCTIONS Functions

Function	AEP	LwAEP	ULwAEP
asctime_r()	MAN	NRQ	NRQ
ctime_r()	MAN	NRQ	NRQ
flockfile()	NRQ	NRQ	NRQ
ftrylockfile()	NRQ	NRQ	NRQ
funlockfile()	NRQ	NRQ	NRQ
getc_unlocked()	NRQ	NRQ	NRQ
getchar_unlocked()	NRQ	NRQ	NRQ
getgrgid_r()	NRQ	NRQ	NRQ
getgrnam_r()	NRQ	NRQ	NRQ
getlogin_r()	NRQ	NRQ	NRQ
getpwnam_r()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
getpwuid_r()	NRQ	NRQ	NRQ
gmtime_r()	MAN	NRQ	NRQ
localtime_r()	MAN	NRQ	NRQ
putc_unlocked()	NRQ	NRQ	NRQ
putchar_unlocked()	NRQ	NRQ	NRQ
rand_r()	MAN	NRQ	NRQ
readdir_r()	MAN	NRQ	NRQ
strerror_r()	MAN	NRQ	NRQ
strtok_r()	MAN	NRQ	NRQ
ttyname_r()	NRQ	NRQ	NRQ

B.6.1.20 XSI Thread Mutex Ext Option Requirements Behavior

SCA469 The function listed in **Table 21** shall behave as described in the referenced clause.

Table 21: XSI_THREAD_MUTEX_EXT Functions

Function	AEP	LwAEP	ULwAEP
pthread_mutexattr_gettype()	MAN	NRQ	NRQ
pthread_mutexattr_settype()	MAN	MAN[12]	MAN[13]

[12] The value of the type attribute is always equal to PTHREAD_MUTEX_NORMAL.
[13] The value of the type attribute is always equal to PTHREAD_MUTEX_NORMAL.

B.6.2 POSIX.1 C Language Specific

B.6.2.1 C Language-Specific Support Services Function Behavior

SCA490 The functions listed in **Table 22** shall behave as described in the applicable clauses of POSIX [4].

Table 22: POSIX_C_LANG_SUPPORT Functions

Function	AEP	LwAEP	ULwAEP
fesetenv()	NRQ	NRQ	NRQ
abs()	MAN	MAN	NRQ

Function	AEP	LwAEP	ULwAEP
asctime()	MAN	MAN	NRQ
asctime_r()	MAN	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
atof()	MAN	MAN	NRQ
atoi()	MAN	MAN	NRQ
atol()	MAN	MAN	NRQ
atoll()	NRQ	NRQ	NRQ
bsearch()	MAN	MAN	NRQ
calloc()	MAN	MAN	NRQ
ctime()	MAN	MAN	NRQ
ctime_r()	MAN	NRQ	NRQ
difftime()	NRQ	NRQ	NRQ
div()	NRQ	NRQ	NRQ
feclearexcept()	NRQ	NRQ	NRQ
fegetenv()	NRQ	NRQ	NRQ
fegetexceptflag()	NRQ	NRQ	NRQ
fegetround()	NRQ	NRQ	NRQ
feholdexcept()	NRQ	NRQ	NRQ
feraiseexcept()	NRQ	NRQ	NRQ
fesetexceptflag()	NRQ	NRQ	NRQ
fesetround()	NRQ	NRQ	NRQ
fetestexcept()	NRQ	NRQ	NRQ
feupdateenv()	NRQ	NRQ	NRQ
free()	MAN	MAN	NRQ
gmtime()	MAN	MAN	NRQ
gmtime_r()	MAN	NRQ	NRQ
imaxabs()	NRQ	NRQ	NRQ
imaxdiv()	NRQ	NRQ	NRQ
isalnum()	MAN	MAN	NRQ
isalpha()	MAN	MAN	NRQ
isblank()	MAN	NRQ	NRQ
iscntrl()	MAN	MAN	NRQ
isdigit()	MAN	MAN	NRQ
isgraph()	MAN	MAN	NRQ
islower()	MAN	MAN	NRQ
isprint()	MAN	MAN	NRQ

Function	AEP	LwAEP	ULwAEP
ispunct()	MAN	MAN	NRQ
isspace()	MAN	MAN	NRQ
isupper()	MAN	MAN	NRQ
isxdigit()	MAN	MAN	NRQ
labs()	MAN	NRQ	NRQ
ldiv()	NRQ	NRQ	NRQ
llabs()	NRQ	NRQ	NRQ
lldiv()	NRQ	NRQ	NRQ
localeconv()	NRQ	NRQ	NRQ
localtime()	MAN	MAN	NRQ
localtime_r()	MAN	NRQ	NRQ
malloc()	MAN	MAN	NRQ
memchr()	MAN	MAN	NRQ
memcmp()	MAN	MAN	NRQ
memcpy()	MAN	MAN	NRQ
memmove()	MAN	MAN	NRQ
memset()	MAN	MAN	NRQ
mktime()	MAN	MAN	NRQ
qsort()	MAN	MAN	NRQ
rand()	MAN	MAN	NRQ
rand_r()	MAN	NRQ	NRQ
realloc()	MAN	MAN	NRQ
Setlocale()	MAN	MAN	NRQ
snprintf()	MAN	NRQ	NRQ
sprintf()	NRQ	NRQ	NRQ
srand()	MAN	MAN	NRQ
sscanf()	MAN	MAN	NRQ
strcat()	NRQ	NRQ	NRQ
strchr()	MAN	MAN	NRQ
strcmp()	MAN	MAN	NRQ
strcoll()	MAN	NRQ	NRQ
strcpy()	NRQ	NRQ	NRQ
strcspn()	MAN	MAN	NRQ

Function	AEP	LwAEP	ULwAEP
strerror()	MAN	NRQ	NRQ
strerror_r()	MAN	NRQ	NRQ
strftime()	MAN	MAN	NRQ
strlen()	MAN	MAN	NRQ
strncat()	MAN	MAN	NRQ
strncmp()	MAN	MAN	NRQ
strncpy()	MAN	MAN	NRQ
strpbrk()	MAN	MAN	NRQ
strrchr()	MAN	MAN	NRQ
strspn()	MAN	MAN	NRQ
strstr()	MAN	MAN	NRQ
strtod()	MAN	NRQ	NRQ
strtof()	NRQ	NRQ	NRQ
strtoimax()	NRQ	NRQ	NRQ
strtok()	MAN	MAN	NRQ
strtok_r()	MAN	NRQ	NRQ
strtol()	MAN	NRQ	NRQ
strtold()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
strtoll()	NRQ	NRQ	NRQ
strtoul()	MAN	NRQ	NRQ
strtoull()	NRQ	NRQ	NRQ
strtoumax()	NRQ	NRQ	NRQ
strxfrm()	MAN	NRQ	NRQ
time()	MAN	MAN	NRQ
tolower()	MAN	MAN	NRQ
toupper()	MAN	MAN	NRQ
tzset()	NRQ	NRQ	NRQ
va_arg()	MAN	NRQ	NRQ
va_copy()	MAN	NRQ	NRQ
va_end()	MAN	NRQ	NRQ
va_start()	MAN	NRQ	NRQ
vsnprintf()	MAN	NRQ	NRQ
vsprintf()	NRQ	NRQ	NRQ
vsscanf()	NRQ	NRQ	NRQ

NOTE:

- Support for dynamic memory allocation is essential to re-entrant object-oriented design.

B.6.2.2 C Language-Specific Mathematical Function Behavior

SCA491 The functions listed in **Table 23** shall behave as described in the applicable clauses of POSIX [4].

Table 23: POSIX_C_LANG_MATH Functions

Function	AEP	LwAEP	ULwAEP
acos()	MAN	MAN	NRQ
acosf()	NRQ	NRQ	NRQ
acosh()	MAN	MAN	NRQ
acoshf()	NRQ	NRQ	NRQ
acoshl()	NRQ	NRQ	NRQ
acosl()	NRQ	NRQ	NRQ
asin()	MAN	MAN	NRQ
asinf()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
asinh()	MAN	MAN	NRQ
asinhf()	NRQ	NRQ	NRQ
asinhl()	NRQ	NRQ	NRQ
asinl()	NRQ	NRQ	NRQ
atan()	MAN	MAN	NRQ
atan2()	MAN	MAN	NRQ
atan2f()	NRQ	NRQ	NRQ
atan2l()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
atanf()	NRQ	NRQ	NRQ
atanh()	MAN	MAN	NRQ
atanhf()	NRQ	NRQ	NRQ
atanhl()	NRQ	NRQ	NRQ
atanl()	NRQ	NRQ	NRQ
cabs()	NRQ	NRQ	NRQ
cabsf()	NRQ	NRQ	NRQ
cabsl()	NRQ	NRQ	NRQ
cacos()	NRQ	NRQ	NRQ
cacosf()	NRQ	NRQ	NRQ
cacosh()	NRQ	NRQ	NRQ
cacoshf()	NRQ	NRQ	NRQ
cacoshl()	NRQ	NRQ	NRQ
cacosl()	NRQ	NRQ	NRQ
carg()	NRQ	NRQ	NRQ
cargf()	NRQ	NRQ	NRQ
cargl()	NRQ	NRQ	NRQ
casin()	NRQ	NRQ	NRQ
casinf()	NRQ	NRQ	NRQ
casinh()	NRQ	NRQ	NRQ
casinhf()	NRQ	NRQ	NRQ
casinhl()	NRQ	NRQ	NRQ
casinl()	NRQ	NRQ	NRQ
catan()	NRQ	NRQ	NRQ
catanf()	NRQ	NRQ	NRQ
catanh()	NRQ	NRQ	NRQ
catanhf()	NRQ	NRQ	NRQ
catanhl()	NRQ	NRQ	NRQ
catanl()	NRQ	NRQ	NRQ
cbrt()	NRQ	NRQ	NRQ
cbrtf()	NRQ	NRQ	NRQ
cbrtl()	NRQ	NRQ	NRQ
ccos()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
ccosf()	NRQ	NRQ	NRQ
ccosh()	NRQ	NRQ	NRQ
ccoshf()	NRQ	NRQ	NRQ
ccoshl()	NRQ	NRQ	NRQ
ccosl()	NRQ	NRQ	NRQ
ceil()	MAN	MAN	NRQ
ceilf()	NRQ	NRQ	NRQ
ceill()	NRQ	NRQ	NRQ
cexp()	NRQ	NRQ	NRQ
cexpf()	NRQ	NRQ	NRQ
cexpl()	NRQ	NRQ	NRQ
cimag()	NRQ	NRQ	NRQ
cimagf()	NRQ	NRQ	NRQ
cimagl()	NRQ	NRQ	NRQ
clog()	NRQ	NRQ	NRQ
clogf()	NRQ	NRQ	NRQ
clogl()	NRQ	NRQ	NRQ
conj()	NRQ	NRQ	NRQ
conjf()	NRQ	NRQ	NRQ
conjl()	NRQ	NRQ	NRQ
copysign()	NRQ	NRQ	NRQ
copysignf()	NRQ	NRQ	NRQ
copysignl()	NRQ	NRQ	NRQ
cos()	MAN	MAN	NRQ
cosf()	NRQ	NRQ	NRQ
cosh()	MAN	MAN	NRQ
coshf()	NRQ	NRQ	NRQ
coshl()	NRQ	NRQ	NRQ
cosl()	NRQ	NRQ	NRQ
cpow()	NRQ	NRQ	NRQ
cpowf()	NRQ	NRQ	NRQ
cpowl()	NRQ	NRQ	NRQ
cproj()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
cprojf()	NRQ	NRQ	NRQ
cprojl()	NRQ	NRQ	NRQ
creal()	NRQ	NRQ	NRQ
crealf()	NRQ	NRQ	NRQ
creall()	NRQ	NRQ	NRQ
csin()	NRQ	NRQ	NRQ
csinf()	NRQ	NRQ	NRQ
csinh()	NRQ	NRQ	NRQ
csinhf()	NRQ	NRQ	NRQ
csinhl()	NRQ	NRQ	NRQ
csinl()	NRQ	NRQ	NRQ
csqrt()	NRQ	NRQ	NRQ
csqrtf()	NRQ	NRQ	NRQ
csqrtl()	NRQ	NRQ	NRQ
ctan()	NRQ	NRQ	NRQ
ctanf()	NRQ	NRQ	NRQ
ctanh()	NRQ	NRQ	NRQ
ctanhf()	NRQ	NRQ	NRQ
ctanhl()	NRQ	NRQ	NRQ
ctanl()	NRQ	NRQ	NRQ
erf()	NRQ	NRQ	NRQ
erfc()	NRQ	NRQ	NRQ
erfcf()	NRQ	NRQ	NRQ
erfcl()	NRQ	NRQ	NRQ
erff()	NRQ	NRQ	NRQ
erfl()	NRQ	NRQ	NRQ
exp()	MAN	MAN	MAN
exp2()	MAN	MAN	MAN
exp2f()	NRQ	NRQ	NRQ
exp2l()	NRQ	NRQ	NRQ
expf()	NRQ	NRQ	NRQ
expl()	NRQ	NRQ	NRQ
expm1()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
expm1f()	NRQ	NRQ	NRQ
expm1l()	NRQ	NRQ	NRQ
fabs()	MAN	MAN	NRQ
fabsf()	NRQ	NRQ	NRQ
fabsl()	NRQ	NRQ	NRQ
fdim()	NRQ	NRQ	NRQ
fdimf()	NRQ	NRQ	NRQ
fdiml()	NRQ	NRQ	NRQ
floor()	MAN	MAN	NRQ
floorf()	NRQ	NRQ	NRQ
floorl()	NRQ	NRQ	NRQ
fma()	NRQ	NRQ	NRQ
fmaf()	NRQ	NRQ	NRQ
fmal()	NRQ	NRQ	NRQ
fmax()	NRQ	NRQ	NRQ
fmaxf()	NRQ	NRQ	NRQ
fmaxl()	NRQ	NRQ	NRQ
fmin()	NRQ	NRQ	NRQ
fminf()	NRQ	NRQ	NRQ
fminl()	NRQ	NRQ	NRQ
fmod()	MAN	MAN	NRQ
fmodf()	NRQ	NRQ	NRQ
fmodl()	NRQ	NRQ	NRQ
fpclassify()	NRQ	NRQ	NRQ
frexp()	MAN	MAN	NRQ
frexpf()	NRQ	NRQ	NRQ
frexpl()	NRQ	NRQ	NRQ
hypot()	NRQ	NRQ	MAN
hypot()	NRQ	NRQ	MAN
hypotl()	NRQ	NRQ	NRQ
ilogb()	NRQ	NRQ	NRQ
ilogbf()	NRQ	NRQ	NRQ
ilogbl()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
isfinite()	NRQ	NRQ	NRQ
isgreater()	NRQ	NRQ	NRQ
isgreaterequal()	NRQ	NRQ	NRQ
isinf()	NRQ	NRQ	NRQ
isless()	NRQ	NRQ	NRQ
islessequal()	NRQ	NRQ	NRQ
islessgreater()	NRQ	NRQ	NRQ
isnan()	NRQ	NRQ	NRQ
isnormal()	NRQ	NRQ	NRQ
isunordered()	NRQ	NRQ	NRQ
ldexp()	MAN	MAN	NRQ
ldexpf()	NRQ	NRQ	NRQ
ldexpl()	NRQ	NRQ	NRQ
lgamma()	NRQ	NRQ	NRQ
lgammaf()	NRQ	NRQ	NRQ
lgammal()	NRQ	NRQ	NRQ
llrint()	NRQ	NRQ	NRQ
llrintf()	NRQ	NRQ	NRQ
llrintl()	NRQ	NRQ	NRQ
llround()	NRQ	NRQ	NRQ
llroundf()	NRQ	NRQ	NRQ
llroundl()	NRQ	NRQ	NRQ
log()	MAN	MAN	NRQ
log10()	MAN	MAN	NRQ
log10f()	NRQ	NRQ	NRQ
log10l()	NRQ	NRQ	NRQ
log1p()	NRQ	NRQ	NRQ
log1pf()	NRQ	NRQ	NRQ
log1pl()	NRQ	NRQ	NRQ
log2()	MAN	MAN	NRQ
log2f()	NRQ	NRQ	NRQ
log2l()	NRQ	NRQ	NRQ
logb()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
logbf()	NRQ	NRQ	NRQ
logbl()	NRQ	NRQ	NRQ
logf()	NRQ	NRQ	NRQ
logl()	NRQ	NRQ	NRQ
lrint()	NRQ	NRQ	NRQ
lrintf()	NRQ	NRQ	NRQ
lrintl()	NRQ	NRQ	NRQ
lround()	NRQ	NRQ	NRQ
lroundf()	NRQ	NRQ	NRQ
lroundl()	NRQ	NRQ	NRQ
modf()	MAN	MAN	NRQ
modff()	NRQ	NRQ	NRQ
modfl()	NRQ	NRQ	NRQ
nan()	NRQ	NRQ	NRQ
nanf()	NRQ	NRQ	NRQ
nanl()	NRQ	NRQ	NRQ
nearbyint()	NRQ	NRQ	NRQ
nearbyintf()	NRQ	NRQ	NRQ
nearbyintl()	NRQ	NRQ	NRQ
nextafter()	NRQ	NRQ	NRQ
nextafterf()	NRQ	NRQ	NRQ
nextafterl()	NRQ	NRQ	NRQ
nexttoward()	NRQ	NRQ	NRQ
nexttowardf()	NRQ	NRQ	NRQ
nexttowardl()	NRQ	NRQ	NRQ
pow()	MAN	MAN	NRQ
powf()	NRQ	NRQ	NRQ
powl()	NRQ	NRQ	NRQ
remainder()	NRQ	NRQ	NRQ
remainderf()	NRQ	NRQ	NRQ
remainderl()	NRQ	NRQ	NRQ
remquo()	NRQ	NRQ	NRQ
remquof()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
remquol()	NRQ	NRQ	NRQ
rint()	NRQ	NRQ	NRQ
rintf()	NRQ	NRQ	NRQ
rintl()	NRQ	NRQ	NRQ
round()	MAN	MAN	NRQ
roundf()	NRQ	NRQ	NRQ
roundl()	NRQ	NRQ	NRQ
scalbln()	NRQ	NRQ	NRQ
scalblnf()	NRQ	NRQ	NRQ
scalblnl()	NRQ	NRQ	NRQ
scalbn()	NRQ	NRQ	NRQ
scalbnf()	NRQ	NRQ	NRQ
scalbnl()	NRQ	NRQ	NRQ
signbit()	NRQ	NRQ	NRQ
sin()	MAN	MAN	NRQ
sinf()	NRQ	NRQ	NRQ
sinh()	MAN	MAN	NRQ
sinhf()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
sinhl()	NRQ	NRQ	NRQ
sinl()	NRQ	NRQ	NRQ
sqrt()	MAN	MAN	NRQ
sqrtf()	NRQ	NRQ	NRQ
sqrtl()	NRQ	NRQ	NRQ
tan()	MAN	MAN	NRQ
tanf()	NRQ	NRQ	NRQ
tanh()	MAN	MAN	NRQ
tanhf()	NRQ	NRQ	NRQ
tanhl()	NRQ	NRQ	NRQ
tanl()	NRQ	NRQ	NRQ
tgamma()	NRQ	NRQ	NRQ
tgammaf()	NRQ	NRQ	NRQ
tgammal()	NRQ	NRQ	NRQ
trunc()	MAN	MAN	NRQ
truncf()	NRQ	NRQ	NRQ
truncl()	NRQ	NRQ	NRQ

B.6.2.3 C Language-Specific Non-local Jump Function Behavior

SCA464 The functions listed in **Table 24** shall behave as described in the applicable clauses of POSIX [4].

Table 24: POSIX_C_LANG_JUMP Functions

Function	AEP	LwAEP	ULwAEP
longjmp()	NRQ	NRQ	NRQ
setjmp()	NRQ	NRQ	NRQ

NOTE:

- This is a form of context switch used to support a non-local exit.

B.6.3 POSIX Standard C Library Header Files

SCA492 The Standard C [3] Library header files listed in **Table 25** shall be included within the AEP as described in the referenced clause. All symbols (other than operations) included within the header files with a MAN or PRT designation are considered elements of the profile.

Table 25: POSIX Standard C Library Header Files

Header File	AEP	LwAEP	ULwAEP
assert.h	NRQ	NRQ	NRQ
complex.h	NRQ	NRQ	NRQ
ctype.h	MAN	PRT	NRQ
errno.h	MAN	NRQ	NRQ
fenv.h	NRQ	NRQ	NRQ
float.h	NRQ	NRQ	NRQ
inttypes.h	NRQ	NRQ	NRQ
iso646.h	NRQ	NRQ	NRQ
limits.h	MAN	NRQ	NRQ
locale.h	PRT	PRT	NRQ
math.h	NRQ	NRQ	NRQ
setjmp.h	NRQ	NRQ	NRQ
signal.h	MAN	NRQ	NRQ

Header File	AEP	LwAEP	ULwAEP
stdarg.h	PRT	NRQ	NRQ
stdbool.h	MAN	NRQ	NRQ
stddef.h	MAN	MAN	NRQ
stdint.h	MAN	NRQ	NRQ
stdio.h	PRT	NRQ	NRQ
stdlib.h	PRT	PRT	NRQ
string.h	PRT	PRT	NRQ
tgmath.h	PRT	PRT	NRQ
time.h	PRT	PRT	NRQ
wchar.h	NRQ	NRQ	NRQ
wctype.h	NRQ	NRQ	NRQ

B.6.4 Event and Networking Behavior

B.6.4.1 Networking Function Behavior

SCA493 The functions listed in **Table 26** shall behave as described in the applicable clauses of POSIX [4].

Table 26: POSIX_NETWORKING Functions

Function	AEP	LwAEP	ULwAEP
accept()	MAN	NRQ	NRQ
bind()	MAN	NRQ	NRQ
connect()	MAN	NRQ	NRQ
endhostent()	NRQ	NRQ	NRQ
endnetent()	NRQ	NRQ	NRQ
endprotoent()	NRQ	NRQ	NRQ
endservent()	NRQ	NRQ	NRQ
freeaddrinfo()	NRQ	NRQ	NRQ
gai_strerror()	NRQ	NRQ	NRQ
getaddrinfo()	NRQ	NRQ	NRQ
gethostbyaddr()	NRQ	NRQ	NRQ
gethostbyname()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
gethostent()	NRQ	NRQ	NRQ
gethostname()	NRQ	NRQ	NRQ
getnameinfo()	NRQ	NRQ	NRQ
getnetbyaddr()	NRQ	NRQ	NRQ
getnetbyname()	NRQ	NRQ	NRQ
getnetent()	NRQ	NRQ	NRQ
getpeername()	NRQ	NRQ	NRQ
getprotobyname()	NRQ	NRQ	NRQ
getprotobynumber()	NRQ	NRQ	NRQ
getprotoent()	NRQ	NRQ	NRQ
getservbyname()	NRQ	NRQ	NRQ
getservbyport()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
getservent()	NRQ	NRQ	NRQ
getsockname()	NRQ	NRQ	NRQ
getsockopt()	MAN	NRQ	NRQ
h_errno()	NRQ	NRQ	NRQ
htonl()	MAN	NRQ	NRQ
htons()	MAN	NRQ	NRQ
if_freenameindex()	NRQ	NRQ	NRQ
if_indextoname()	NRQ	NRQ	NRQ
if_nameindex()	NRQ	NRQ	NRQ
if_nametoindex()	NRQ	NRQ	NRQ
inet_addr()	NRQ	NRQ	NRQ
inet_ntoa()	NRQ	NRQ	NRQ
inet_ntop()	NRQ	NRQ	NRQ
inet_pton()	NRQ	NRQ	NRQ
listen()	MAN	NRQ	NRQ
ntohl()	MAN	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
ntohs()	MAN	NRQ	NRQ
recv()	MAN	NRQ	NRQ
recvfrom()	MAN	NRQ	NRQ
recvmsg()	NRQ	NRQ	NRQ
send()	MAN	NRQ	NRQ
sendmsg()	NRQ	NRQ	NRQ
sendto()	MAN	NRQ	NRQ
sethostent()	NRQ	NRQ	NRQ
setnetent()	NRQ	NRQ	NRQ
setprotoent()	NRQ	NRQ	NRQ
setservent()	NRQ	NRQ	NRQ
setsockopt()	MAN	NRQ	NRQ
shutdown()	NRQ	NRQ	NRQ
sockatmark()	NRQ	NRQ	NRQ
socket()	MAN	NRQ	NRQ
socketpair()	NRQ	NRQ	NRQ

NOTES:

- MAN functions are for SCA compliant applications that require this functionality.
- The supported functions are not intended to replace JTRS Standard APIs for application control.
- Waveform developers should be cognizant of whether the target RTOS supports sending and receiving via multiple communication paths from a single application address space. For instance some RTOS implementations may have stack limitations that could prevent a single Waveform application address space from being able to handle CORBA calls (i.e. accessing IP stack for IIOP) and also make socket calls (i.e. accessing another separate IP stack).

B.6.4.2 Event Management Function Behavior

SCA470 The functions listed in **Table 27** shall behave as described in the applicable clauses of POSIX [4].

Table 27: POSIX_EVENT_MGMT Functions

Function	AEP	LwAEP	ULwAEP
FD_CLR()	NRQ	NRQ	NRQ
FD_ISSET()	NRQ	NRQ	NRQ
FD_SET()	NRQ	NRQ	NRQ
FD_ZERO()	NRQ	NRQ	NRQ
pselect()	NRQ	NRQ	NRQ

Function	AEP	LwAEP	ULwAEP
select()	MAN	NRQ	NRQ

NOTE:

- Note: MAN functions are for SCA compliant applications that require this functionality

B.7 ATTACHMENTS

N/A