

SPARC COMPLIANCE DEFINITION 2.0

**SCD
2.0**

SPARC International

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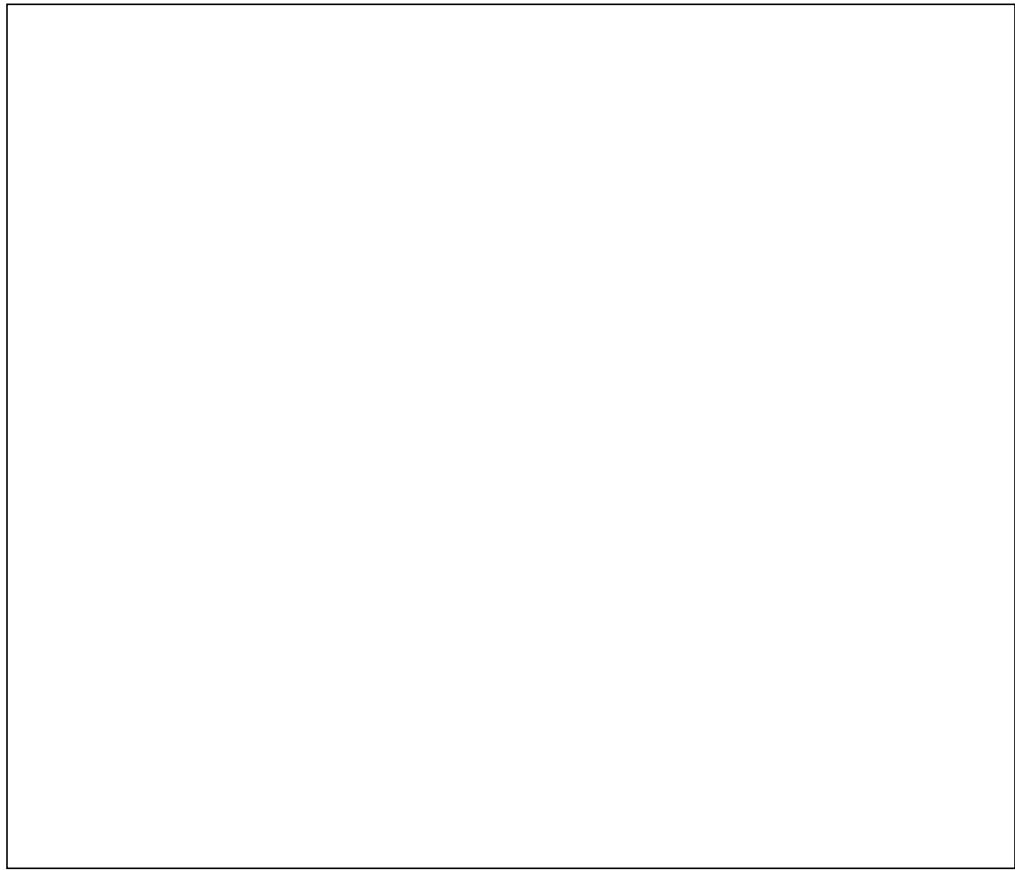


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Preface

Preface

Audience and Purpose

The *SPARC International Compliance Definition* (SCD) is intended for use by anyone who is committed to creating compatible SPARC/UNIX products that comply to the SPARC conformance standards.

This publication is intended to fulfill the following purposes:

- Provide reference to items necessary in SPARC SCD 2.0 compliance.
- Identify areas beyond the System V Application Binary Interface (ABI) that the SPARC community deems important.
- Address ambiguous and / or loose specifications in current ABI documents.

Organization and Content

The SCD 2.0 has been divided into two major portions that are, in turn, subdivided into chapters:

- Chapter 1 Introduction
- Chapter 2 Low-Level Machine Interfaces
- PART 1: SYSTEM V ABI
 - Chapter 3 The System Library, `libsys`
 - Chapter 4 The C Library, `libc`
 - Chapter 5 The Network services Library, `libns1`
 - Chapter 6 Commands for Application Programs
- PART 2: ADDITIONAL INTERFACES
 - Chapter 7 The `ioctl()` Interfaces
 - Chapter 8 The X11R4 Protocol Requests
 - Chapter 9 The ONC/NFS Interfaces

Preface

Publication Conventions

This publication uses page format and typographic variances to highlight particular kinds of information. These conventions of usage are generally consistent with publication conventions used by other UNIX publications, such as the *AT&T System V Interface Definition*, Third Edition.

Other Publication Conventions

The following typographical conventions are used within the text of this publication:

- Filenames, pathnames, and system messages are shown in:
`typewriter font like this.`
- Titles of chapters in this publication are shown in plain Roman font, inside quotation marks like this: "Introduction."
- Document titles are shown in plain, nonbold italic font like this: *AT&T System V Interface Definition*.



CHAPTER 1: INTRODUCTION



Introduction

Introduction

Overview

The SPARC Compliance Definition, or SCD, defines a set of interfaces that all SPARC Compliant systems must provide in their implementations. The SCD Release 2.0 provides information for both source- and binary-level compatibility, encompassing both the System V Application Binary Interface (ABI), and the System V Application Binary Interface SPARC Processor Supplement documents.

Terminology

Two terms that are used in this document are EXTENSIONS and OPTIONS. In the context of SCD 2.0, EXTENSIONS are features beyond the scope of the ABI documents, but that the SPARC community has decided offer a richer operating environment. OPTIONS are features that, although they also offer a richer operating environment, are deemed non-essential in providing a binary compatible environment. Consequently, OPTIONS are not required to be present on all SPARC compliant systems; however, if they are present, they must support the syntax and semantics as specified in SCD 2.0.

Intended Audience

The intended audience of the SCD 2.0 consists of two groups: system implementors, and application developers. For system implementors, SCD 2.0 provides a reference to all interfaces and features that a SPARC system must provide to be SPARC compliant at the SCD 2.0 level. For application developers, SCD 2.0 provides a reference to interfaces and features that may be used reliably across all SPARC compliant systems.

Related Publications

The SCD 2.0 references the following documents:

- *System V Application Binary Interface*
Prentice Hall, ISBN 0-13-877598-2
- *System V Application Binary Interface SPARC Processor Supplement*
Prentice Hall, ISBN 0-13-8777630-X
- *System V Interface Definition*, Third Edition, Volumes 1 - 4

Introduction

AT&T Select Code 320-136 (Volume 1), 320-137 (Volume 2), 320-138 (Volume 3),
320-139 (Volume 4)

- *X Protocol Reference Manual*
O'Reilly and Associates, Inc., ISBN 0-937175-50-1

These documents may be acquired from most technical book stores, or optionally through SPARC International; they are necessary sources of detailed information for the interfaces and features listed in SCD 2.0

SCD 2.0 represents a proper superset of the required interfaces and features described in the two ABI documents, and consequently, a superset of System V Release 4.0. One of the purposes of this document is to serve as the conduit through which features may migrate first into the processor specific (SPARC) ABI (psABI), and finally into the generic ABI (gABI). Consequently, SCD 2.0 includes a set of features and their associated interfaces that are beyond the ABI definitions. These features, and their associated interfaces have been included, in some cases to correct deficiencies in the ABI specifications, and in others to standardize functionality already in common use throughout the SPARC community. With approval from UNIX International/UNIX System Laboratories, features from SCD will migrate into the SPARC ABI and ultimately into the generic ABI.

SCD 2.0 is divided into two parts. Part 1 contains interfaces and features specified by the ABI documents. These interfaces are required for ABI conformance and as such define System V Release 4.0

Part 2 contains value-added features and interfaces. These interfaces are extensions to the base System V definition, although all SPARC compliant systems will be required to provide these interfaces with the outlined semantics and functionality.

Compliance Testing

SCD 2.0 is the specification against which all SPARC-based systems will be measured for compliance. Compliance testing will verify that the interfaces provided by platforms have the specified semantics and syntax through the use of a suite of binary tests that will be executed on the platform. This suite of compliance tests will also be used to verify those features found in the ABI documents that do not necessarily have interfaces, but that are still required in order to ensure binary compatibility. Examples of these features are found in the SPARC psABI chapters on object files, program loading and linking, and low-level system information.



CHAPTER 2: SYSTEM FEATURES



System Features

System Features

Overview

While SPARC-compliant systems must all provide the interfaces that are listed in the following chapters, there are additional features that all SPARC-compliant systems must provide. These additional features do not necessarily have function interfaces associated with them. These features are:

- object file format
- program loading and linking
- low-level system information
- formats and protocols
- software installation

The first three features are described in detail in the SPARC psABI for System V Release 4. Formats and protocols, and software installation are described in the System V ABI.

System Features



CHAPTER 3: LIBSYS



The System Library

Overview

This chapter contains the `libsys` interfaces to basic system services listed in the System V ABI and described in sections BA_OS, BA_LIB, BA_ENV, KE_OS, and RT_OS of the *System V Interface Definition, Third Edition*.

The libsys Interfaces

The interfaces listed below in Table 3-1 have been included in SCD 2.0 because they are required to be present in the dynamic library `/usr/lib/libsys.so.1` on all systems conforming to the System V ABI. Issues regarding synonyms and global data symbols associated with this library can be found in the System V ABI.

The System Library

Table 3-1. libsys Contents

_exit	fsync	malloc	rewinddir	sigsend
access	ftok	memcntl	rmdir	sigsendset
acct	getcontext	mkdir	seekdir	sigset
alarm	getcwd	mknod	semctl	sigsetjmp
atexit	getegid	mllock	semget	sigsuspend
calloc	getepid	mmap	semop	stat
catclose	geteuid	mount	setcontext	statvfs
catgets	getgid	mprotect	setgid	stime
catopen	getgrgid	msgctl	setgroups	strcoll
chdir	getgrnam	msgget	setlocale	strerror
chmod	getgroups	msgrcv	setpgid	strftime
chown	getlogin	msgsnd	setpgrp	strxfrm
chroot	getmsg	msync	setrlimit	symlink
close	getpgid	munlock	setsid	sync
closedir	getpgrp	munmap	setuid	sysconf
creat	getpid	nice	shmat	system
dup	getpmsg	open	shmctl	telldir
execl	getppid	opendir	shmdt	termio
execle	getpwnam	pathconf	shmget	time
execlp	getpwuid	pause	sigaction	times
execv	getrlimit	pipe	sigaddset	ttynname
execve	getsid	poll	sigaltstk	ulimit
execvp	gettext	profil	sigdelset	umask
exit	getuid	ptrace	sigemptyset	umount
fattach	grantpt	ptsname	sigfillset	uname
fchdir	initgroups	putmsg	sighold	unlink
fchmod	ioctl	putpmsg	sigignore	unlockpt
fchown	isastream	read	sigismember	utime
fcntl	kill	readdir	siglongjmp	wait
fdetach	lchown	readlink	signal	waitid
fork	link	readv	sigpause	waitpid
fpathconf	localeconv	realloc	sigpending	write
free	lseek	remove	sigprocmask	writev
fstatvfs	lstat	rename	sigrelse	

The System Library

Table 3-2. libsys SPARC Support Routines

.div	.rem	.stret2	.stret8	.umul
.mul	.stret1	.stret4	.udiv	.urem
_Q_add	_Q_cmp	_Q_cmpe	_Q_div	_Q_dtoq
_Q_feq	_Q_fge	_Q_fgt	_Q_fle	_Q_flt
_Q_fne	_Q_itoq	_Q_mul	_Q_neg	_Q_qtod
_Q_qtoi	_Q_qtos	_Qqtou	_Q_sqrt	_Q_stoq
_Q_sub	_Q_utoq	.div	_dtou	_ftou
.mul	.rem	.stret1	.stret2	.stret4
.stret8	.udiv	.umul	.urem	

The System Library



CHAPTER 4: LIBC



The C Library

Overview

This chapter contains the `libc` facilities listed in the *System V ABI* and described in the *System V Interface Definition, Third Edition*.

The libc Interfaces

Interfaces listed below in Table 4-1 have been included because they are required on all systems conforming to the System V ABI, although a dynamic library for `libc` is optional (i.e., `libc` may be present as either `/usr/lib/libc/so.1`, or `libc.a`). Issues regarding synonyms and global data symbols associated with this library can be found in the System V ABI.

The C Library

Table 4-1. libc Contents

_tolower	fmtmsg	isgraph	printf	strtok
_toupper	fopen	islower	putc	strtol
abort	fprintf	isnan	putchar	strtoul
abs	fputc	isnand	putenv	swab
addseverity	fputs	isprint	puts	tcdrain
asctime	fread	ispunct	putw	tcflow
assert	freopen	isspace	qsort	tcflush
atof	frexp	isupper	raise	tcgetattr
atoi	fscanf	isxdigit	rand	tcgetpgrp
atol	fseek	labs	rewind	tcgetsid
bsearch	fsetpos	ldexp	scanf	tcsendbreak
cfgetispeed	ftell	ldiv	setbuf	tcsetpgrp
cfgetospeed	fwrite	localtime	setjmp	tdelete
cfsetispeed	getc	lockf	setvbuf	tell
cfsetospeed	getchar	longjmp	sleep	tempnam
clearerr	getenv	lsearch	sprintf	tfind
clock	getdate	mblen	srand	tmpfile
ctermid	getopt	mbstowcs	sscanf	tmpnam
ctime	getpass	mbtowc	strcat	toascii
cuserid	gets	memccpy	strchr	tolower
difftime	getsubopt	memchr	strcmp	toupper
div	getw	memcpy	strcpy	tsearch
dup2	gmtime	memmove	strcspn	twalk
exit	hcreate	memset	strupd	tzset
fclose	hdestroy	mkfifo	strlen	ungetc
fdopen	hsearch	mktemp	strncat	vfprintf
feof	ifind	mktme	strncmp	vprintf
ferror	isalnum	monitor	strncpy	vsprintf
fflush	isalpha	nftw	strpbrk	wcstombs
fgetc	isascii	nl_langinfo	strrchr	wctomb
fgetpos	isatty	pclose	strspn	
fgets	iscntrl	perror	strstr	
fileno	isdigit	popen	strtod	



CHAPTER 5: LIBNSL



The Network Services Library

The Network Services Library

Overview

This chapter contains the `libnsl` interfaces listed in the *System V ABI*, and described in the *System V Interface Definition*, Third Edition.

Transport Providers

All SPARC-compliant systems will provide a transport provider interface for TCP/IP. The device name for this transport provider interface is `/dev/tcp`.

The libnsl Interfaces

The interfaces listed below in Table 5-1 have been included in SCD 2.0 because they are required to be present on all systems conforming to the System V ABI, in the dynamic library `/usr/lib/libnsl.so.1`. Issues regarding synonyms and global data symbols associated with this library can be found in the System V ABI.

The Network Services Library

Table 5-1. libnsl Contents

t_accept	t_error	t_look	t_rcvdis	t_snddis
t_alloc	t_free	t_open	t_rcvrel	t_sndrel
t_bind	t_getinfo	t_optmgmt	t_rcvudata	t_sndudata
t_close	t_getstate	t_rcv	t_rcvuderr	t_sync
t_connect	t_listen	t_rcvconnect	t_snd	t_unbind



CHAPTER 6: COMMANDS



Commands for Application Programs

Commands for Application Programs

Overview

This chapter contains the commands for application programs as listed in the *System V ABI*, and described in the *System V Interface Definition*, Third Edition.

Commands for Application Programs

Table 6-1. Commands for Application Programs

cat	ed	logname	sed	tty
cd*	ex	lp	sh	umask*
chgrp	expr	ls	sleep	uname
chmod	false	mkdir	sort	uucp
chown	find	mv	stty	uulog
cmp	fmtmsg	passwd	su	uustat
cp	gettext	pg	tail	uux
cpio	grep	pr	tee	vi
date	id	priocntl	test*	wait*
dd	kill	pwd	touch	who
df	line	rm	tr	
echo*	ln	rmdir	true	

Commands marked with an asterisk are also built into the standard UNIX system shell (shBU_CMD).



CHAPTER 7: IOCTL



The `ioctl` Requests

The `ioctl()` Requests

Overview

The interfaces listed below in Table 6-1 are `ioctl` requests included as extensions to the *SPARC psABI* and the *System V gABI*.

The `ioctl` Requests

Table 7-1. `ioctl` Requests

arp	fbio	kb	nit_if	termio
audio	filio	ldterm	nit_pf	ttcompat
bk	if	ms	pty	
console	ioctl	mtio	sockio	
dkio	inet	nit_buf	streamio	



CHAPTER 8: X11R4



The X11R4 Protocol Requests

The X11R4 Protocol Requests

Overview

This chapter contains the X11R4 protocol requests listed and described in the *X Protocol Reference Manual for X Version 11, Volume Zero*.

The Protocol Requests

The protocol requests listed below in Table 7-1 have been included as extensions to the requirements specified in the System V ABI. In Particular, the System V ABI specifies that, when a windowing system is present, it shall be implemented with X11 Release 3. The use of the Release 4 protocol allows the use of clients based on either Release 3 or Release 4.

The X11R4 Protocol Requests

Table 8-1. X11R4 Protocol Requests

AllocColor	CreateGlyphCursor
AllocColorCells	CreateNotify
AllocColorPlanes	CreatePixmap
AllocNamedColor	CreateWindow
AllowEvents	DeleteProperty
Bell	DestroyNotify
ButtonPress	DestroySubwindows
ButtonRelease	DestroyWindow
ChangeActivePointerGrab	EnterNotify
ChangeGC	Expose
ChangeHosts	FillPoly
ChangeKeyboardControl	FocusIn
ChangeKeyboardMapping	FocusOut
ChangePointerControl	ForceScreenSaver
ChangeProperty	FreeColormap
ChangeSaveSet	FreeColors
ChangeWindowAttributes	FreeCursor
CirculateNotify	FreeGC
CirculateRequest	FreePixmap
CirculateWindow	GetAtomName
ClearArea	GetFontPath
ClientMessage	GetGeometry
CloseFont	GetImage
ColormapNotify	GetInputFocus
ConfigureNotify	GetKeyboardControl
ConfigureRequest	GetKeyboardMapping
ConfigureWindow	GetModifierMapping
Connection_Setup	GetMotionEvents
ConvertSelection	GetPointerControl
CopyArea	GetPointerMapping
CopyColormapAndFree	GetProperty
CopyGC	GetScreenSaver
CopyPlane	GetSelectionOwner
CreateColormap	GetWindowAttributes
CreateCursor	GrabButton
CreateGC	GrabKey

The X11R4 Protocol Requests

Table 7-1. X11R4 Protocol Requests (continued)

GrabKeyboard	PolyRectangle
GrabPointer	PolySegment
GrabServer	PolyText16
GraphicsExpose	PolyText8
GravityNotify	PropertyNotify
ImageText16	PutImage
ImageText8	QueryBestSize
InstallColormap	QueryColors
InternAtom	QueryExtension
Introduction	QueryFont
KeyRelease	QueryKeymap
KeymapNotify	QueryPointer
Keypress	QueryTextExtents
KillClient	QueryTree
LeaveNotify	ReColorCursor
ListExtensions	ReparentNotify
ListFonts	ReparentWindow
ListFontsWithInfo	ResizeRequest
ListHosts	RotateProperties
ListInstalledColormaps	SelectionClear
ListProperties	SelectionNotify
LookupColor	SelectionRequest
MapNotify	SendEvent
MapRequest	SetAccessControl
MapSubwindows	SetClipRectangles
MapWindow	SetCloseDownMode
MappingNotify	SetDashes
MotionNotify	SetFontPath
NoExpose	SetInputFocus
NoOperation	SetModifierMapping
OpenFont	SetPointerMapping
PolyArc	SetScreenSaver
PolyFillArc	SetSelectionOwner
PolyFillRectangle	StoreColors
PolyLine	StoreNamedColor
PolyPoint	TranslateCoordinates

The X11R4 Protocol Requests

Table 7-1. X11R4 Protocol Requests (continued)

UngrabButton	UnmapNotify
UngrabKey	UnmapSubwindows
UngrabKeyboard	UnmapWindow
UngrabPointer	VisibilityNotify
UngrabServer	
UninstallColormap	WarpPointer



CHAPTER 9: ONC/NFS



The ONC/NFS Interfaces

The ONC/NFS Interfaces

Overview

This chapter contains the remote services interfaces listed in the *System V ABI*, and described in sections RS_LIB of the *System V Interface Definition*, Third Edition.

The ONC/NFS Interfaces

The interfaces listed below in Table 8-1 have been included in the SCD 2.0 as extensions to the requirements stated in the System V ABI and the SPARC psABI. Although shipped with System V Release 4, NFS is not a mandatory part of the ABI. This extension addresses the particular computing environment within the SPARC community of diskless clients and servers in a heterogeneous environment.

The ONC/NFS Interfaces

Table 9-1. ONC/NFS Contents

getnetconfig	rpc_clnt_create	secure_rpc
getnetpath	rpc_svc_calls	xdr_admin
netdir	rpc_svc_create	xdr_complex
nfssys	rpc_svc_err	xdr_create
publickey	rpc_svc_reg	xdr_simple
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