Index

Symbols

Numbers

32-bit addressing
  address size, 3
  page size, 5
64-bit addressing
  address size, 3
  page size, 5
8-bit clean codesets, 205

A

access permissions, file, 150
address range, 3
address space, 3-10
  cannot undefine, 6
  copy-on-write pages, 10
  defining addresses, 5
  heap segment, 4
  interrogating, 10
  limits of, 6
  low 4 MB reserved, 23
  lowest used address, 4
  protection, 29
  read-only pages, 10
  resident set size, 9
  segment, 4
  segment reserved for user mapping, 23
  stack segment, 4
  text segment, 4
  virtual size of, 6, 17
arenas
  example, 40
  IPC, 35
  IRIX IPC, 35
Argentina country code, 275
ASCII strings. *See* internationalization codesets, ASCII
Australia country code, 275
Austria country code, 275

B

backing store, 6, 9, 13, 30
barriers
  allocating, 49
Belgium country code, 275
Brazil country code, 275
brk(), 6, 7
BSD and IPC, 34

C

cache
  address mapping in Challenge/Onyx, 27
  effect of miss, 26
  management, 26-29
  multiprocessor conflicts, 28
cache line, 26
calling process, suspend, 52
calloc(), 9
catalogs. *See* message catalogs
Challenge/Onyx architecture
  cache address mapping, 27
  cache management in, 26
  PIO error latency, 21
character sets. *See* internationalization, character sets
Chile country code, 275
China country code, 275
chkconfig command, 8
chmod command, 19
C local value, 202
codes, country, 275
codesets. *See* internationalization, codesets
Colombia country code, 275
conventions, syntax, xxiii
country codes, 275-278
Courier font, 171
ctype
  character classification, 215

D

data segment
  locking, 25
data structure. *See* IPC message queues
deadlocks, 161
Denmark country code, 276
/dev/mem, 20
/dev/mmem, 21
/dev/vme, 21
/dev/zero
  and **mmap()**, 15, 20
DSO, text segment for, 4

E

editres, 267
Egypt country code, 276
empty strings, 200
encodings. *See* internationalization, encodings
errno variable, 57
EUC encoding
  Chinese, 244
  German, 244
  Japanese, 243

F

fcntl(), 148, 152
file, mapping into memory, 16, 26
file access permissions and **mmap()**, 18
file and record locking, 147-163
  access permissions, 150
  across systems, 163
  advisory, 147, 163
  advisory locking, 149
  changing lock types, 149
  deadlocks, 161
  definitions, 148
  efficiency, comparative, 163
  exclusive locks, 148
  F_GETLK, 158
  F_SETLK, 156

F_TEST, 160
F_ULOCK, 158
F_UNLCK, 158
failure, 154
fcntl(), 152
forking, 161
lockf(), 153
lock information, 158
locking a file, 152
lseek(), 154
mandatory, 147, 163
assuring, 162
mandatory locking, 149
multiple read locks, 158
opening files, 151
order of lock removal, 158
overview, 147-148
promoting a lock, 149
read locks, 148
removing locks, 154
setting locks, 154
sharing locks, 148
write locks, 148
file descriptor
with **mmap()**, 13
file typing rules, 237
LEGEND, 237
MENUCMD, 237
Finland country code, 276
fonts, 167-187
accessing, 172
adding, 177-185
bitmap font, 180-182
font files, 179
font metric file, 185
outline font, 182-185
Utopia Regular font files, 179
aliases, 173
character, defined, 169
display characters, 174
downloading, 186
images, 169
installing, 177-185
missing fonts, 186
names, 171, 173
opening a shell window, 176
path, 176
pixels, 169
point size, 170
PostScript printers, 186
programming access, 172
resolution and size, 169
scaling, 174
Speedo format, 177
Type 1 font, 177, 186-187
typeface, defined, 169
using APIs, 172
Utopia fonts, 186
viewing, 174
virtual memory, 187
xfd command, 174
X Window System, 171, 173-185
fontsets, 243-245
creating, 244
specifying, 243
using, 245
fork()
defines address space, 5
new address space copy-on-write, 10
forking, 161
France country code, 276
ftruncate() on memory-mapped file, 18

G

Germany country code, 276
getpagesize(), 5
getrlimit(), 6

H

heap segment, 4, 6
Hong Kong country code, 276

I

i18n. *See* internationalization
inline functions and cache management, 27
input methods. *See* internationalization, input methods
internationalization, 191-271
  ANSI compatible functions, 218
  character classification, 215
  character classification tables, 220
  character expressions, 223
  character sets
    and X, 241
    defined, 204
  codesets
    ASCII, 205, 206
    defined, 204
  collating sequence tables, 220
  composing characters, 250
  configuration data, 219
  ctype, 215
  cultural data, 225
  customs, 217
  date formats, 214
  defined, 193
  eight-bit cleanliness, 205
  encodings
    about, 202
    and filesystem, 204
    Asian languages, 270
    defined, 204
    EUC, 271
    European languages, 268
    ISO 10646, 271
    ISO 8859, 268
    Latin 1, 268
    multibyte, 206
    Unicode, 271
    wchar, 206, 210
  file I/O, 211
  file typing rules, 237
  fmtmsg(), 236
  GL input, 249
  GUIs, 265-267
    composition, 266
    editres, 267
    icons, 267
    layout, 266
    localized layout, 267
    object labels, 265
    text labels, 265
  icons, 267
  initializing *Xlib*, 242
  input contexts, 257-261
    creating, 260
    styles, 257
    using, 261
    values, 259
  input methods, 252-264
    about, 248
    event handling, 262
    Off-the-Spot style, 255
    On-the-Spot style, 256
    opening, 252
    Over-the-Spot style, 255
    root window style, 254
    setting styles, 256
    status, 254
    strings, 262
    using styles, 256
    XFilterEvent(), 262
    XLookupString(), 262

language information, 221
languages
  Asian, 270
  in locale strings, 201
  Japanese, 269
  Latin
library functions, 218
localeconv(), 214
locale-specific behavior, 216
locales. *See* locales
message catalogs, 229
MNLS
  fmtmsg(), 236
  message catalogs. *See* message catalogs, MNLS
  pfmt(), 235
monetary formats, 213
Motif, 247
multibyte characters
  about
  converting, 208
  size of, 208
  string length, 209
  using, 207
multilingual support, 203
native language support, 219
numerical formats, 213
pfmt(), 235
printf(), 214, 238
regular expressions, 216, 217, 222
regular expressions, examples, 224
setlocal(), 200
setting locale, 198
shift tables, 221
signed chars, 206
sorting rules, 211
standards, 195
strings, 229
territories, 201
time formats, 214
Unicode, 271
user input, 248
  application programming, 248
  text objects, 248
  toolkit text object, 248
  wide characters
  about, 206
  converting, 210
XFontSetExtents(), 245
XPG/3
  message catalogs. *See* message catalogs
  regular expressions, 216
X Window System
  about, 240
  changes, 240
  character sets, 241
  EUC encoding, 243
  fontsets, 243
  keyboard support, 250-251
  limitations, 240
  resource names, 242
  string resources, 265
  vertical text, 241
  XFontSetExtents, 245
  Xlib changes, 241
Inter-Process Communication. *See* IPC
interrupt
  validity fault, 9
IPC
  arenas, 35
  barriers, 49
  BSD-style, 34
  IPC_CREAT, 53, 103
  IPC_EXCL, 54, 79, 82, 106
  IPC_NOWAIT, 67, 76
  IPC_PRIVATE, 54, 55, 79
  IPC_RMID, 60
  IPC_SET, 60
  IPC_STAT, 60
  ipcs command, 79, 103
  IRIX arenas, 35
  IRIX shared memory, 39

IRIX-style, 34, 35-50
keys, 35, 53
locks, 47
message operation permissions, 55
message operations, 51, 53
message queues, 51, 52-53
  controlling, 54
  creating, 53, 55
  data structure, 52
  getting, 55
  maximum number, 57
messages, 51-71
  automatic truncating, 67
  errno variable, 57
  limit total number, 66
  msgctl(), 51, 54, 60
    example, 60
  msgget(), 51, 53, 55
    example, 57
  msgrcv(), 65, 66
    example, 67
  msgsnd(), 65
    example, 67
  receiving, 65, 66
  sending, 65
MSG_NOERROR, 67
MSG_R, 56
MSG_W, 56
msgctl(), 51, 54, 60
msgflg(), 53, 56
msgget(), 51, 53, 55
MSGMNI, 57
msgrcv(), 65, 66
msgsnd(), 65
MSGTQL, 66
msqid(), 52
parallel programming, 35
portability, 35
removing facilities, 76
semaphores, 75-98
  arrays of operations, 76
  blocking operations, 76
  control commands, 81
  controlling, 79, 82, 86
  creating, 75, 78
  decrementing, 75
  getting, 78, 80
  identifiers, 77
  incrementing, 75
  maximum number allowed, 75
  nonblocking operations, 76
  numbering, 76
  number of, limits, 82
  operation permissions, 80
  operations, 95
    limits, 96
  ownership, 75
  semctl(), 75, 79
    example, 87
  semget(), 75, 78, 80
    example, 83
  semop(), 75, 76, 95
    example, 97
  set structure, 77
  testing values, 76
  undo structures, 77
semctl(), 75, 79, 82, 86
semget(), 75, 78, 80
semid(), 77
SEMMNI, 82
SEMMNS, 82
SEMMSL, 75, 82
semop(), 75, 76, 95
SEMOPM, 96

setting message permissions, 56
shared memory, 101-120
attaching, 101, 116
control commands, 105
controlling, 101, 104, 110
creating, 103, 104
detaching, 101, 116
getting, 103, 104
number of segments, limit, 106
operation permissions, 105
shmat(), 101, 116
example, 117
shmctl(), 101, 104, 110
example, 111
shmdt(), 101, 116
example, 117
shmget(), 103, 104
example, 107
size, limits, 106
using, 102
shmat(), 101, 116
shmctl(), 101, 104, 110
shmdt(), 101, 116
shmget(), 103, 104
SHMMAX, 106
SHMMIN, 106
SHMMNI, 106
sockets, 35
suspending execution, 76
SVR4-style, 34, 51-120
System V-style, 51-120
types, 35
ipcs command, 54
Iran country code, 276
Ireland country code, 276
IRIX and IPC, 34, 39
ISO 3166 Country Codes, 275-278
Israel country code, 276
Italy country code, 276

J

Japan country code, 276

K

Kenya country code, 276
kernel
address space limits in, 6
kernel address space, 3
Korea country code, 276

L

l10n. *See* localization
languages, ISO. *See* internationalization, encodings
languages, Latin. *See* internationalization, encodings
Laos country code, 277
LC_ALL, 199
LC_COLLATE, 199
LC_CTYPE, 199
LC_MESSAGES, 199
LC_MONETARY, 199
LC_NUMERIC, 199
LC_TIME, 199
LEGEND, 237
lightweight process
and mapped segments, 15
limits command, 6
linked lists and cache management, 27
locale
Motif, 247
locales, 198-204
categories, 199
C locale value, 202
collation, 213

cultural data, 225
data location, 201
date formats, 214, 225
defined, 193
empty strings, 200
encoding, 202
languages, 201
location of data, 201
modifiers, 202
monetary formats, 213
naming conventions, 201
nonempty strings, 201
numerical formats, 213
setlocale(), 198
setting current, 198
sorting rules, 211
territories, 201
time formats, 214
locale-specific behavior
date, 225
time, 225
Locality of Reference, 27
localization
defined, 193
empty strings, 200
nonempty strings, 201
lockf()
to protect mapped file, 19
lockf(), 148, 153
locking, file and record. *See* file and record locking
lock removal, order, 158
locks
allocate, 47
and shared arenas, 47
operations on, 49
log file warning messages, 187
lp log file warning messages, 187
lseek()
for file size, 16
lseek(), 154

M

Macau country code, 277
madvise(), 30
malloc(), 6, 7
use, 8
used to find limit of swap, 7
MAP_AUTOGROW flag, 14, 15, 20
MAP_FIXED flag, 17, 22, 23
MAP_LOCAL flag, 15
MAP_PRIVATE flag, 15, 18
MAP_SHARED flag, 14, 18
memalign(), 27
memory, 3-30
address ranges of, 3
backing store for, 6
interrogating size of, 10
locking pages in, 24-26
page, 5
protection, 29
segment, 4
See also memory mapping, virtual memory, 11
memory, shared. *See* IPC
memory mapping, 6, 11-23
and file access permissions, 18
at fixed addresses, 23
choosing segment address for, 22
conflicts with normal file access, 18
for I/O, 16-19
locking mapped file, 26
mandatory file locks with, 19
of kernel memory, 21

of NFS-mounted file**msync()**, 18
of physical memory, 20
of segment of zeros, 20
of VME device, 21
private copy of file, 19
replacing a mapped segment, 17
to create shared segments, 19
when pages are defined, 15
MENUCMD, 237
message catalogs, 229-239
closing, 230
file typing rules, 237
incompatibilities, 229
locating, 231
MNLS
fmtmsg(), 236
pfmt(), 235
pfmt() flags, 235
pfmt() format strings, 236
strings, 233
using, 233
NLSPATH, 231
opening, 230
reading, 230
specifying, MNLS, 234
XPG/3
about, 229
compiling, 232
creating, 231
using, 230
message operations
blocking, 51
nonblocking, 51
message queue identifier, 52
messages. *See* IPC
Mexico country code, 277
MIPS ABI
reserved address space, 23
mmap(), 12-23
and file permissions, 18
and NFS-mounted files, 18
in place of **lseek()**, 17
of */dev/mem*, 20
of */dev/mmem*, 21
of */dev/vme/**, 21
of zero segment, 20
parameters of, 13, 19
using specified addresses, 23
when swap is allocated, 15
MNLS
Also see message catalogs
message catalogs, 233-238
monitor resolution, 169
Motif
internationalization, 247
MPI
converting PVM program to, 289-??
differences from PVM, 282-284
porting, ??-304
mpin(), 24, 26
msgctl(), 51, 54, 60
msgget(), 51, 53, 55
msgrcv(), 65, 66
msgsnd(), 65
msqid(), 52
msync(), 16, 30
multibyte characters. *See* internationalization, multibyte characters
multilingual support, 203
munpin(), 24, 26

N

names, country, 275
nationalized software, 194
New Zealand country code, 277
NFS and memory-mapped files, 18

Nigeria country code, 277
NLSPATH, 231

O

Off-the-Spot style, 255
On-the-Spot style, 256
open(), 13
  of */dev/zero*, 20
Over-the-Spot style, 255

P

page
  copy on write, 10
  locking, 24
  read-only, 10
  releasing unneeded, 30
page fault
  prevent by locking memory, 24
page size, 5
page validation, 9
parallel programming, 35
path
  fonts, 176
performance effects of cache, 26
performance tools, 28
pixie command, 29
plock(), 24
  example of, 25
polled semaphore, 46
Portugal country code, 277
PostScript printers, 186
printers, PostScript, 186
printf(), 238
printf() message catalogs, 238
process
  address space, 4
prof command, 29
programming
  fonts, 172
  parallel, 35
ps command, 6
*ps*command, 9
punlock(), 24
PVM
  converting program to MPI program, 289-??
  differences from MPI, 282-284
  nonportable functions, 288-??
  porting, ??-304
  routines with no MPI counterpart, 288

R

record, definition, 148
record locking. *See* file and record locking
resident set size, 9
rlimit kernel parameter, 6

S

Saudi Arabia country code, 278
segment, 4
  heap, 4
  locking, 25
  lowest address, 4
  stack, 4
  text, 4
segment address, 22
segments at fixed offsets, 22

semaphores
  IRIX, 45
  operations on, 47
  polled, 46
semaphores. *See* IPC
semctl(), 75, 79, 82, 86
semget(), 75, 78, 80
semop(), 75, 76, 95
setlocal(), 200
setlocale(), 198
setrlimit(), 6
  limit, 8
shared arenas, 35-50
  allocation in, 45
  barriers, 49
  example, 40
  initializing, 36
  IRIX shared memory, 39
  locks, 47
  using semaphores, 45
shared memory
  IRIX, 39
shared memory. *See* IPC
shared memory segment, 19
shmat(), 101, 116
shmctl(), 101, 104, 110
shmdt(), 101, 116
shmget(), 103, 104
SIGBUS
  on access to truncated mapped file, 18
  on NFS error in mapped file, 18
  on PIO access to invalid bus address, 21
  on reference past end of mapped segment, 12
  on reference to undefined page, 5
SIGKILL
  on reaching limit of virtual swap, 8
  possible when locking pages, 24
signal
  SIGBUS, 5, 12, 18, 21
  SIGKILL, 8, 24
  SIGSEGV, 10, 14, 29
SIGSEGV
  on access to read-only page, 29
  on attempt to change read-only page, 10
  on store past end of mapped segment, 14
sockets, 35
South Africa country code, 278
Spain country code, 278
Speedo format fonts, 177
sproc()
  and mapped segments, 15
stack segment, 4, 5
  locking, 25
structures and cache management, 27
suspend
  calling process, 52
SVR4 and IPC, 34
swap, 6, 9
Sweden country code, 278
Switzerland country code, 278
syntax, conventions, xxiii
systune command, 7

T

Taiwan country code, 278
text rendering routines, 245
text segment, 4
  loaded from program file, 9
  locking, 25
  read-only, 10
Type 1 font. *See* fonts
types
  IPC, 35

typographical conventions, xxiii
typography. *See* fonts

U

Uganda country code, 278
Utopia fonts, 186

V

validity fault, 9
video resolution, 169
virtual address space. *See* address space
virtual memory
  font loading, 187
  loading pages, 9
  synchronizing backing store, 30
  See also memory
virtual page number, 5
virtual size, 6
virtual swap, 7-9
  SIGKILL from, 8
  See also address space
VME PIO, 21
VPN. *See* virtual page number

W

warning messages
  lp log file, 187
wide characters. *See* internationalization, wide characters

X

xfd command, 174
XFilterEvent(), 262
XFontSetExtents, 245
XLFD font names. *See* internationalization, X Window System, fontsets
Xlib changes, 241
XLookupString()<*Default Para Fon*>, 262
XmbLookupString(), 262
XSetLocaleModifiers(), 253
XwcLookupString(), 262
X Window System
  fonts. *See* fonts
  installing fonts. *See* fonts, installing
  internationalization changes, 240
  limitations, 240

Y

You, 8

Z

Zambia country code, 278