Index

abstract data type, 69
accept statement, 166
activation time, see release time
actuator, 82
Ada Reference Manual, 23
aggregate
array, 188
record, 55
aliased object, 61
allocator, 58, 109
Amdahl’s Law, 3
analog to digital converter, 15, 88
aperiodic task, 256
ARM, see Ada Reference Manual
array, 49
 constrained, 52
 unconstrained, 52
assembly language, 98
atomic action, 10
attribute, 45, 53, 76, 86, 121
’first, 45, 53
’image, 45, 46
’last, 45, 53
’length, 53
’partition_id, 220
’position, 86
’pred, 45
’range, 53
’size, 97
’succ, 45
’val, 86
’version, 219
attribute definition clause, 86
’address, 87
’component_size, 97
’size, 86, 87, 97
’small, 356
barrier, 135, 147
Ben-Ari, 5, 142
block, 62
broadcast, 148
capacity, 256, 300, 314, 353
case statement, 27
casting, see type conversion
ceiling priority, 307
Cheddar, 349
child package, 75
class, 76
client-server, 166
communication, 7, 126
concatenation, 52
concurrent programming, 5
condition variables, 324
core, 253
context clause, 24
context switch, 15, 113, 254
conversion, see type conversion
CORBA, 221
CDR, 239
GIOP, 239
IDL, 221, 223
IIOP, 239
IOR, 234, 241
naming service, 237
ORB, 222
POA, 243
servant, 243
critical instant, 261, 305, 313
critical section, 8, 132, 140
critical task, 254
cumulative drift, 300
cyclic executive, 258
deadline, 12, 257
deadline monotonic, 258
deadlines on requests, 261
deadlock, 9
declarative part, 24
declarative region, 33
Index

delay statement
  absolute delay, 178
  relative delay, 177
dereference, 59
device driver, 83, 88
digital to analog converter, 15
Dijkstra, 5
discriminant
  record, 56
task, 109
dispatching policy, 309
distributed object, 198
distributed program, 11
distributed shared memory, 198
distributed system, 195
distributed systems annex, 202
distribution mechanisms, 197
distribution model, 197
DSA, see distributed systems annex
dynamic priority scheduler, 258, 272
earliest deadline first, 272, 345
EDF, see earliest deadline first
elaboration, 63, 110, 111, 219
embedded, 14
entry call, 135, 166
  conditional, 181
timed, 180
entry queue, 141, 307
environment task, 113
epoch, 296
exception, 62, 63, 117
  handler, 64
exhaustive simulations, 252
fairness, 11
feasibility tests, 252
FIFO queuing, 307
firm real-time, 13
fixed priority scheduler, 258
fixed priority scheduling, 260, 311
Florist, 318
for loop, 29, 45
fork, 316
generalization, 77
generic package, 39, 73
guard, 174
hard real-time, 13
harmonic set, 264
holistic analysis, 285
homograph, 33
hyper-period, 263
ICPP, see immediate ceiling priority protocol
IDL, 221, 223
if statement, 26
immediate ceiling priority protocol, 281, 306, 311
independent task, 254
inheritance, see generalization
interface, 223
interrupt, 155
interrupt handler, 156
jitter, 283
library unit, 65
livelock, 21
liveness, 11
local drift, 300
loop parameter, 29
loop statement, 28
  for scheme, 29, 45
  while scheme, 29
machine scalar, 92
marshalling, 240
MaRTE, 344
MAST, 349
memory mapped I/O, 86
message passing, 197
method, 76
middleware, 197
MIMD, 4
MISD, 4
model number, 38
module, 66, 223
monotonic time, 295
mutexes, 324
mutual exclusion, 7, 126
name precedence, 33
naming service, 237
natural, 49
non-preemptive scheduler, 259
null pointer, 58
null range, 30
object, 76
object adapter, 243
off-line scheduler, 258
OMG, 221
on-line scheduler, 258
optimal scheduler, 260
ORK+, 342
package, 66
  child, 75
data abstraction, 69
definition, 66
generic, 39, 73
  service, 68
parallel program, 2
parameter
  association, 25
  mode, 32
partition, 202
Patriot missile, 41
PCP, see priority ceiling protocol
PCS, 213
period, 256, 300
Index

periodic task, 255
parameters, 256
PIP, see priority inheritance protocol
pointer, see type, access
polling, 94, 155, 179
polling server, 277
polymorphism, 77
port mapped I/O, 88
positive, 49
POSIX, 314
API, 318
post-protocol, 8, 132, 144, 278
pragma, 39
all_calls_remote, 219
asynchronous, 215
atomic, 153
atomic_components, 155
attach_handler, 160
inline, 39
interrupt_handler, 161
interrupt_priority, 160, 302
locking_policy, 306
partition_elaboration_policy, 305
priority, 302
profile, 312
 pure, 203
queuing_policy, 307
remote_call_interface, 203
remote_types, 208
shared_passive, 210
storage_size, 111
volatile, 88, 153
volatile_components, 155
warnings, 233
pre-protocol, 8, 132, 144, 278
preemption, 253, 308
preemptive scheduler, 259
priority, 258
active, 300
base, 300
ceiling, 307
priority_ceiling_protocol, 280, 324, 343
priority_inheritance_protocol, 280
priority_inversion, 278
priority_queueing, 307
priority_specific_dispatching, 311
private_operations, 149
process, 107, 119, 318, see task
processor_utilization_factor, 264
producer-consumer, 7, 135
profile, 312
protected_entry, 135
protected_function, 132
protected_object, 130
locks, 132
protected_procedure, 132
quality of service, 14, 239
RACW, see remote access-to-class-wide
RAS, see remote access-to-subprogram
rate monotonic, 258, 260
Ravenscar, 312
real-time, 12
release_time, 255, 298
remote_access-to-class-wide, 204
remote_access-to-subprogram, 203
remote_procedure_call, 198
rendezvous, 166
representation_clause
 enumeration, 85
 record, 91
 requeue, 149, 161, 166
reserved_word, 24
RPC, see remote procedure call
RTEMS, 346
run-time_configuration, 333
run-time_system, 119, 334
scenario, 9, 139
scheduler, 257
scope, 33
select_statement, 171
 accept_alternative, 172, 308
delay_alternative, 176
 else_part, 179
 guarded_alternative, 174
terminate_alternative, 175
semaphore, 144
sensor, 82
servant, 222, 243
shadow_register, 90
SIMD, 3
simulations, exhaustive, 252
SISD, 3
skeleton, 222
soft_real-time, 13
sporadic_task, 256
starvation, 11
state_machine, 181
 active_object, 188
 passive_object, 183
state_transition_table, 185
static_real-time_system, 260
storage_pool, 61
storage_unit, 92
string, 54
stub, 222
subtype, 48
 natural, 49
 positive, 49
synchronization, 6, 134, 167
synchronous_periodic_task, 261
task, 107
 aborting, 120
 activation, 111
task (cont.)
  attributes, 121
  completion, 113
  context, 253
  creation, 110
  defining, 107
  exceptions, 117
  execution, 112
  hierarchy
    master-dependent, 114
    parent-child, 114
  identification, 120
  implementation, 119
  life cycle, 109
  states, 109, 112, 114, 253
  termination, 113
  task control block, 254
  task dispatching times, 309
  task_dispatching_policy, 309
  thread, 119, 315
  transducer, 82
  type
    access, 57, 186
      general, 61
      pool specific, 61
      array, 49
        constrained, 52
        unconstrained, 52
      atomic, 36
      composite, 36

Index

definition of, 35
  derived, 57, 76
  discrete, 43
  enumeration, 43
  extension, 80
  integer
    modular, 47
    signed, 46
  private, 72, 74
  protected, 130
  real, 37
    decimal, 42
    fixed point, 39
    floating point, 38
  record, 55
  scalar, 36
  string, 54
  tagged, 80
  type conversion, 25, 47
  unchecked, 96
  typedef, 224
  urgent task, 254
  use clause, 25, 65, 67
  use type clause, 67
  valid schedule, 260
  WCET, 22, 256, 300, 353
  while loop, 29
  with clause, 24, 65
  worst case response time feasibility test, 265