Introduction to Memory Management

Contents

About Memory 1-4
Organization of Memory by the Operating System 1-4
The System Heap 1-6
The System Global Variables 1-6
Organization of Memory in an Application Partition 1-7
The Application Stack 1-8
The Application Heap 1-9
The Application Global Variables and A5 World 1-12
Temporary Memory 1-13
Virtual Memory 1-15
Addressing Modes 1-15
Heap Management 1-16
Relocatable and Nonrelocatable Blocks 1-16
Properties of Relocatable Blocks 1-20
Locking and Unlocking Relocatable Blocks 1-20
Purging and Reallocating Relocatable Blocks 1-21
Memory Reservation 1-22
Heap Purging and Compaction 1-23
Heap Fragmentation 1-24
Deallocating Nonrelocatable Blocks 1-25
Reserving Memory 1-25
Locking Relocatable Blocks 1-26
Allocating Nonrelocatable Blocks 1-27
Summary of Preventing Fragmentation 1-28
Dangling Pointers 1-29
Compiler Dereferencing 1-29
Loading Code Segments 1-31

Callback Routines 1-32
Invalid Handles 1-33
Disposed Handles 1-33
Empty Handles 1-34
Fake Handles 1-35
Low-Memory Conditions 1-36
Memory Cushions 1-36
Memory Reserves 1-37
Grow-Zone Functions 1-38
Using Memory 1-38
Setting Up the Application Heap 1-38
Changing the Size of the Stack 1-39
Expanding the Heap 1-40
Allocating Master Pointer Blocks 1-41
Determining the Amount of Free Memory 1-42
Allocating Blocks of Memory 1-44
Maintaining a Memory Reserve 1-46
Defining a Grow-Zone Function 1-48
Memory Management Reference 1-50
Memory Management Routines 1-50
Setting Up the Application Heap 1-50
Allocating and Releasing Relocatable Blocks of Memory 1-54
Allocating and Releasing Nonrelocatable Blocks of Memory 1-58
Setting the Properties of Relocatable Blocks 1-60
Managing Relocatable Blocks 1-67
Manipulating Blocks of Memory 1-73
Assessing Memory Conditions 1-75
Grow-Zone Operations 1-77
Setting and Restoring the A5 Register 1-78
Application-Defined Routines 1-80
Grow-Zone Functions 1-80
Summary of Memory Management 1-82
Pascal Summary 1-82
Data Types 1-82
Memory Management Routines 1-82
Application-Defined Routines 1-83
C Summary 1-84
Data Types 1-84
Memory Management Routines 1-84
Application-Defined Routines 1-85
Assembly-Language Summary 1-86
Global Variables 1-86
Result Codes 1-86