Unit OS5: Memory Management

5.5. Quiz

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Approaches to Memory Management

Which one of the techniques mentioned below does not implement a mapping of logical to physical addresses?

a) Paging
b) Swapping
c) Segmentation

3

Size of address space

In a virtual memory management system, the size of a process' address space is restricted by:

a) Size of main memory (minus OS kernel)
b) Number of CPU address bits
c) Clock frequency of CPU
d) Number of available page frames

4

Windows address space

How much address space does a 32-bit Windows process have by default?

a) 1 gigabyte
b) 2 gigabytes
c) 3 gigabytes
d) 4 gigabytes

5

Optimizations

Which of the below-mentioned optimizations can be found in modern operating systems such as Mach or Windows?

a) Copy-on-write
b) Copy-on-read
c) Copy-on-delete
d) Copy-on-execute

6

Copy-on-write

With copy-on-write, read/write pages are shared until:

a) A process modifies the data
b) A 2nd process loads the same DLL
c) A page fault occurs
d) Memory is full

7

Address bits

With 28 address bits, the following amount of memory words (cells) can be addressed:

a) 28
b) 64k
c) 256M
d) 4G

8

Accessing huge memory

Which permits 32-bit Windows to access >4GB of main memory (RAM)?

a) Denser memory chips
b) x86 Physical Addressing Extension (PAE)
c) Larger page file capacity
d) Larger process address space

9

Address space structuring

Which of these are mapped into kernel address space?

a) OS code
b) Driver code
c) Driver data
d) All of the above

10

Data structures

Which of the below-mentioned data structures are not typically used for implementation of a virtual memory management scheme?

a) Page tables
b) Translation Lookaside Buffer (TLB)
c) Open file table
d) Event log

11

Working Set

The working set of a process describes:

a) The set of all pages that are accessible without incurring a page fault
b) The currently executed program image
c) All dynamic libraries (dll) loaded by a process
d) The set of all operating system resources allocated by the process so far

12

Reserved vs. Committed Memory

What is the difference between reserved and committed Memory? Which one of the following statements is nonsense?

a) Committed memory is always also reserved memory
b) For committed memory, space in a page file or a memory-mapped file has been reserved as backing store
c) Reserved (but not committed) memory cannot be paged out
d) Attempts to access reserved but not committed memory result in a memory access violation

13

Virtual Memory Management

When implementing a virtual memory management system with paging, using the following approach has to be strictly avoided:

a) Hardware support in form of the Memory Management Unit (MMU)
b) Page tables in user-space
c) Page tables in kernel-space
d) Translation look-aside buffer (TLB)

14

Memory-mapped Files

Mapped files allow a program to access file data as if it were:

a) In memory
b) On disk
c) In the page file
d) On tape

15

Paging Dynamics

A just starting Windows process (before calling the first Windows API function from user space) can never obtain pages from one of the following lists:

a) Free Page List
b) Zero Page List
c) Modified Page List

16

Page file content

What kind of pages gets written to the page file?

a) Unmodified code pages
b) Unmodified data pages
c) Modified data pages
d) Nonpaged pool

17

Page Faults

In Windows soft and hard page faults are distinguished. Which one of the following statements is true?

a) Soft page faults do not require access to secondary storage
b) Hard page faults will always be satisfied by reading from a page file
c) Soft page faults will never happen in SMP systems
d) Soft page faults will result in working set trimming for other processes

18

Size of Page File(s)

Increasing the size of the page file(s):

a) Improves system performance
b) Reduces paging
c) Increases total process private virtual memory
d) May increase paging

19