

# Unit OS2: Operating System Principles

## 2.5. Quiz

Windows Operating System Internals - by David A. Solomon and Mark E. Russinovich with Andreas Polze

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## Windows OS Design Goals

The design of Windows NT/2000/XP is closely related to a number of initial design goals. Which one was not among them?

- a) Portability
- b) Seamless networking support
- c) Efficiency
- d) (hard) realtime

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## OS Structuring

The Separation of OS functionality in *kernel/user-mode* components has the following goals:

- a) Increasing OS efficiency
- b) Protection of concurrent activities of different users against each other
- c) Protection of file system consistency

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## Subsystems

Which one of the following subsystems does not exist in the Windows NT/2000/XP/2003 operating system family?

- a) WIN32
- b) OS/2
- c) POSIX
- d) VMS

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## Roots of Windows NT/2000/XP

Windows NT/2000/XP has its roots in a number of operating systems. Which OS did not contribute to Windows?

- a) VMS
- b) MS-DOS
- c) IBM OS/360
- d) Unix

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## Similar or identical?

Client (Professional) and Server versions of the Windows 2000 OS differ in the following:

- a) Kernel implementation
- b) Maximum size of the file system
- c) Quantum length used for CPU scheduling
- d) Maximum number of processes

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## System Services

What are the restrictions applicable to services started by the Windows 2000 *System Service Controller*?

- a) No registry access
- b) No access to network volumes
- c) No access to devices except floppy and mouse
- d) No access to the file system

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## Windows NT - supported Hardware

During its evolution, Windows NT has been ported to a number of CPUs. Which processor architecture is not supported by Windows NT?

- a) Intel 80486
- b) Motorola PowerPC
- c) DEC Alpha AXP
- d) SUN Sparc II
- e) MIPS R4000

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## Processes in Windows

● Which of the following does a process not contain?

- a) A private address space
- b) A set of open resources
- c) One or more threads
- d) A hardware context

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## Thread concept

What is a thread?

- a) Component of most fabrics
- b) Execution context within a process
- c) Subroutine in a program
- d) Main routine in a program

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## Address space

● What is the default size of the user address space in 32bit Windows?

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

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## Protection

A user program in Windows NT/2000/XP can corrupt operating system memory?

- a) True
- b) False

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## Protection

Kernel mode is used to protect a process from:

- a) Corrupting operating system memory
- b) Corrupting another process' memory
- c) Being corrupted by the operating system
- d) Being corrupted by another process

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## Operating System Architecture

Windows NT is a microkernel-based OS design

- a) True
- b) False

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## Microkernel

NT is not a true microkernel because:

- a) The kernel is more than 100kb in size
- b) It does not run on handheld devices
- c) It is not based on Mach
- d) All kernel mode components share the same address space

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## Hardware support & portability

How many CPU architectures does Windows 2000 support?

- a) One
- b) Two
- c) Three
- d) Four

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## Multiprocessing

NT's multiprocessor support is called:

- a) Parallel
- b) Mirrored
- c) Symmetric
- d) Asymmetric

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## Subsystem support

Applications call native NT system calls directly

- a) True
- b) False

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## Subsystems

Which subsystem provides the most services?

- a) MS-DOS
- b) Win32
- c) POSIX
- d) OS/2

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## Subsystem functionality

- What do environment subsystems NOT do?
  - a) Interface to native NT system calls
  - b) Define process & file system semantics
  - c) Service interrupts
  - d) All of the above

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## Accessing NT functionality

- Which dynamic link library (DLL) is the interface to the native NT API?
  - a) NTDLL.DLL
  - b) Kernel32.dll
  - c) NtNative.dll
  - d) NtOSkrnl.exe

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## Win32 subsystem implementation

- The Win32 subsystem is partially implemented as device driver
  
- a) True since Windows XP
- b) False
- c) True since Windows NT4

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## Kernel versions

- How many versions of NtOSkrnl.exe are there?
  
- a) 2
- b) 4
- c) 6
- d) 5

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## Windows 2000 packaging

- Which file(s) are the same for all versions of Windows 2000?
  - a) Core operating system
  - b) Core device drivers
  - c) Hardware abstraction layer (HAL)
  - d) All of the above

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## Checked build

What is the purpose of a checked build?

- a) To aid in debugging device drivers
- b) For performance testing
- c) To check for network problems
- d) To debug multiprocessor issues

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## Windows kernel

What is the role of the Windows kernel?

- a) Abstract differences among CPU architectures
- b) Provide low level synchronization primitives
- c) Perform thread scheduling decisions
- d) All of the above

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## Hardware Abstraction Layer

What is the role of the HAL?

- a) Prevent drivers from accessing hardware directly
- b) Make all CPUs look the same to device drivers
- c) Provide a portable interface to the motherboard
- d) Provide access to the I/O system bus

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