

# ABSTRACTION ISN'T THE ENTIRE STORY

CS 045

Computer Organization and  
Architecture

Prof. Donald J. Patterson

Adapted from Bryant and O'Hallaron,  
Computer Systems:  
A Programmer's Perspective, Third Edition

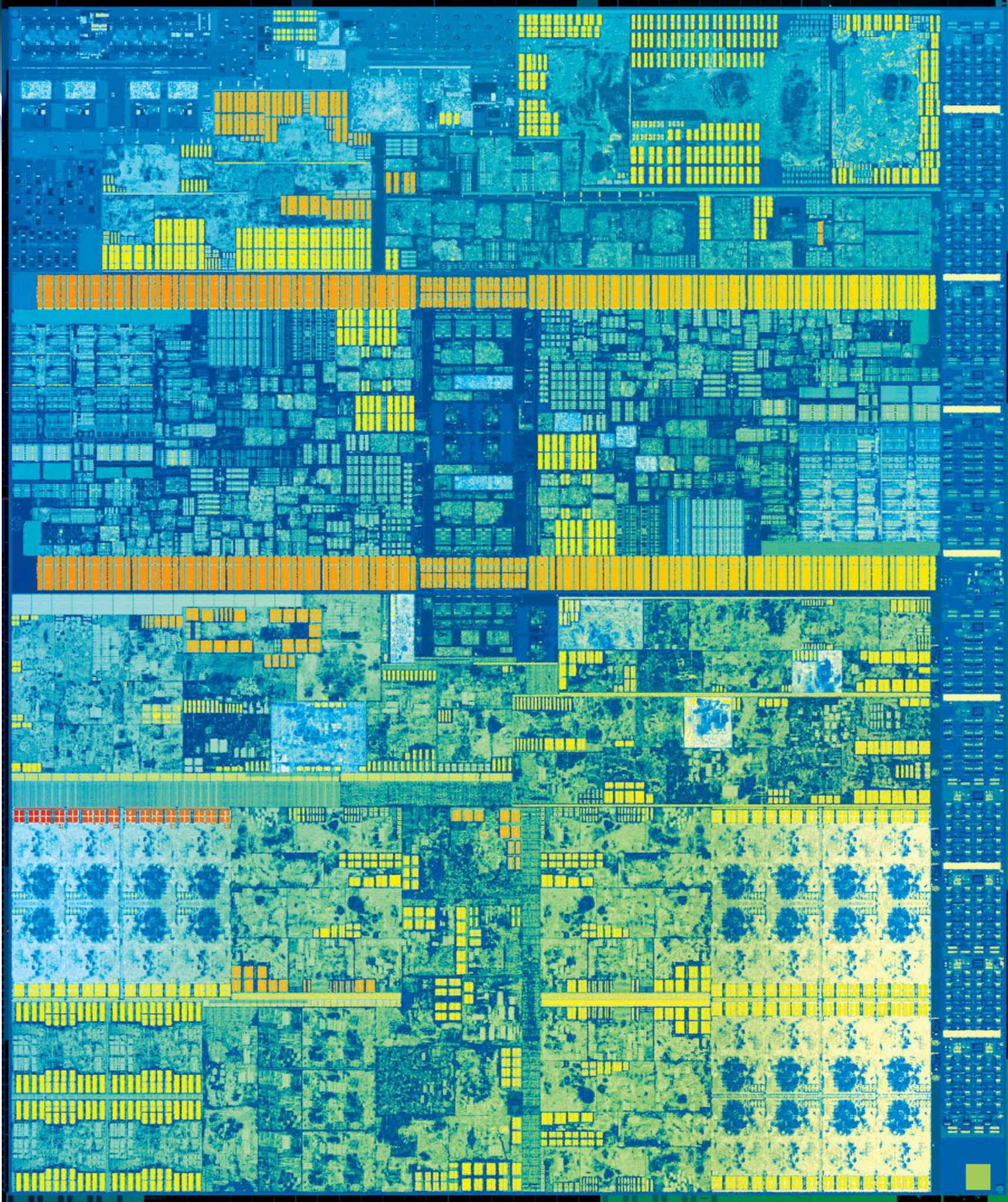
# HARDWARE ORGANIZATION OF A SYSTEM





# HARDWARE

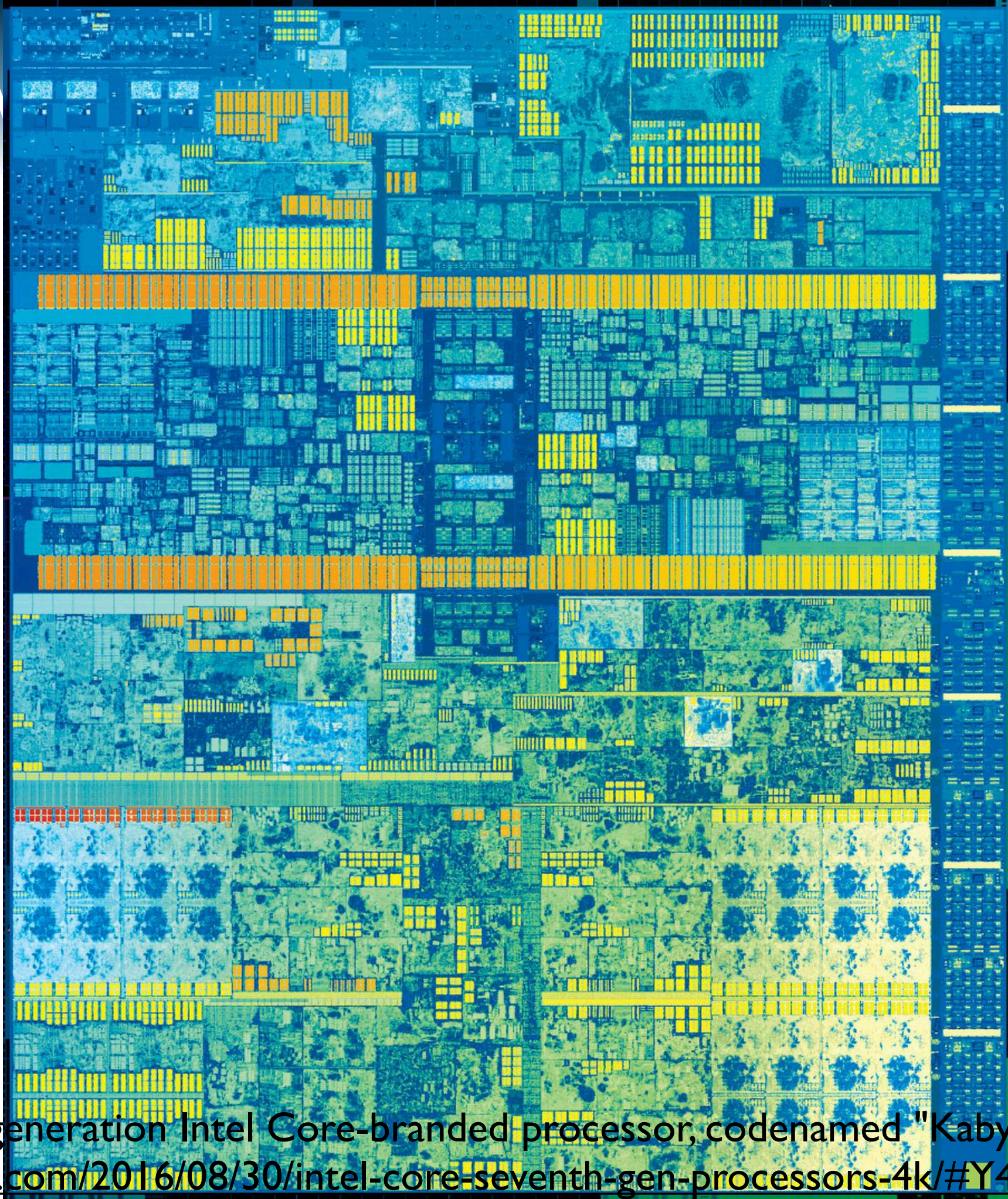
# SYSTEM





# HARDWARE

# SYSTEM



seventh-generation Intel Core-branded processor, codenamed "Kaby Lake."

<http://mashable.com/2016/08/30/intel-core-seventh-gen-processors-4k/#Y4WnvxvjsOqt>



# HARDWARE

# SYSTEM

System Agent w/Display, Memory Control,  
I/O Control and Imaging

CPU Core

Shared Cache

CPU Core

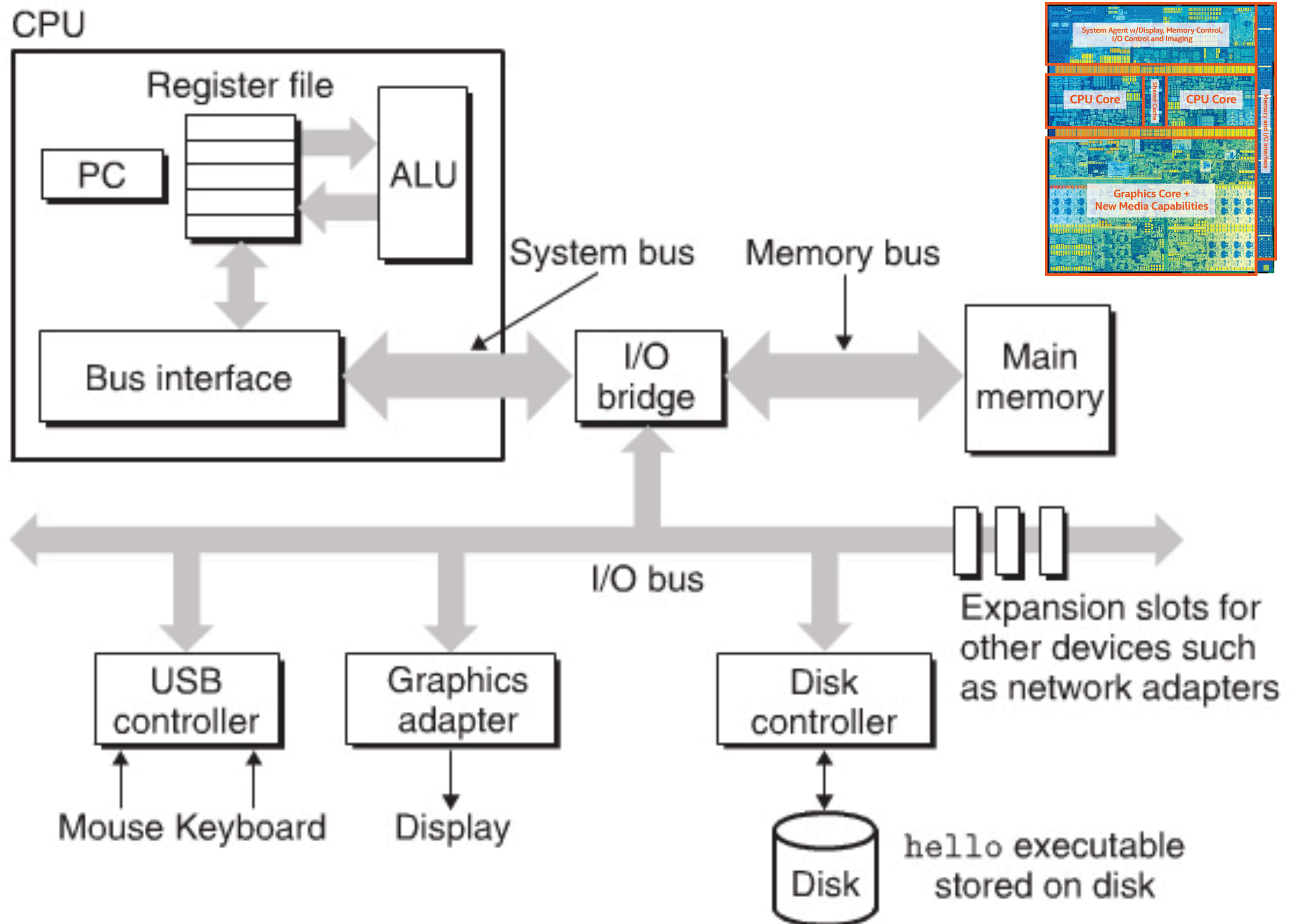
Memory and I/O Interface

Graphics Core +  
New Media Capabilities





# HARDWARE ORGANIZATION OF A SYSTEM

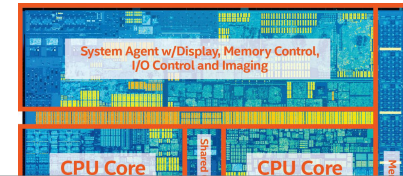




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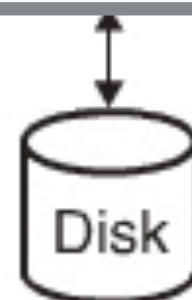
CPU

Register file



Suppose that a real-time clock (RTC), a programmed I/O device, is connected to the I/O bus. It maintains the current time in one of its registers. Software is programmed to send a copy of the current time into some main memory location. Determine the hardware components through which the data (i.e., the current time) must flow when it is transferred from the register of the real time clock device to its target location.

↑      ↑  
Mouse Keyboard      ↓  
Display

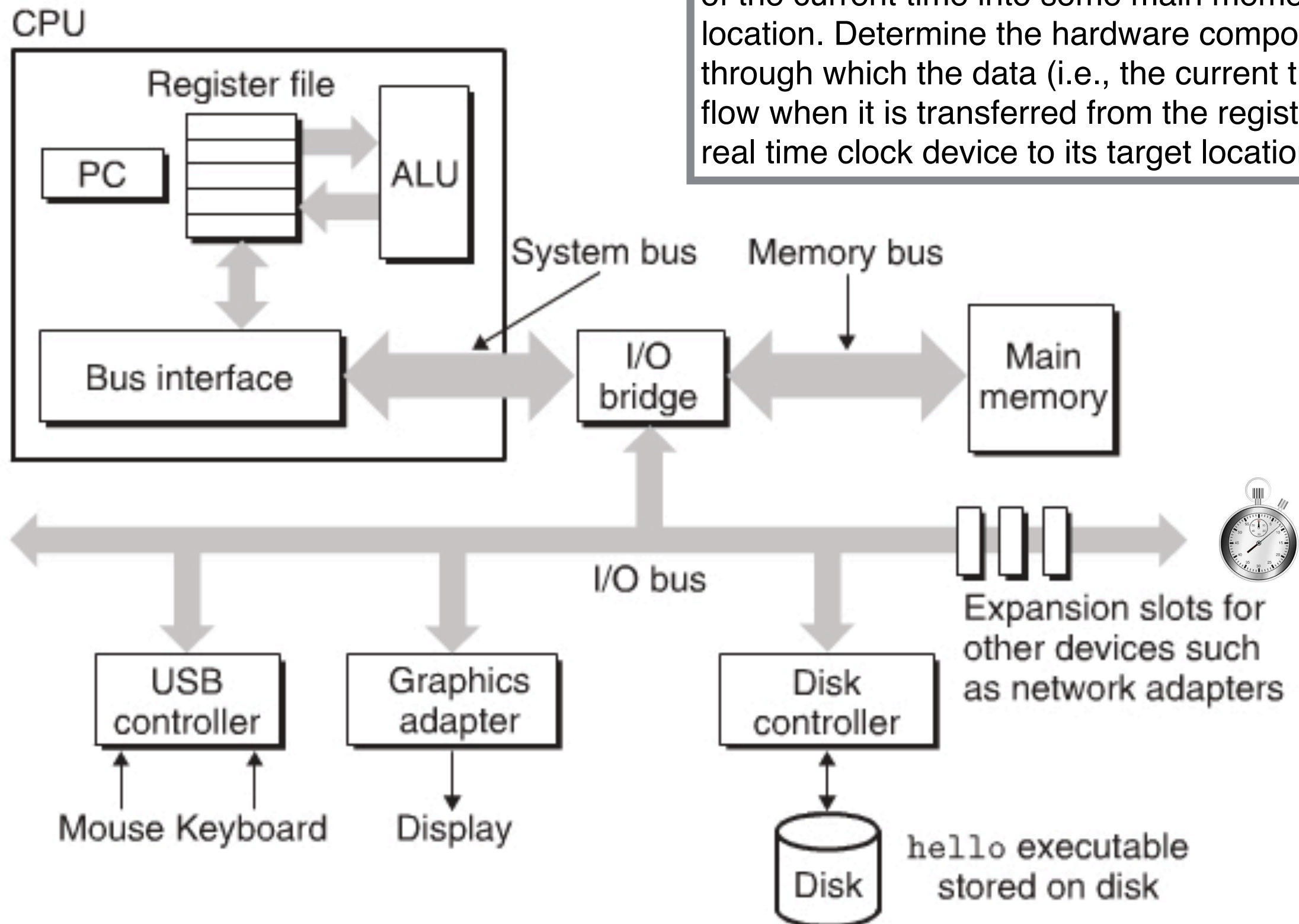


hello executable  
stored on disk



# HARDWARE ORGANIZ

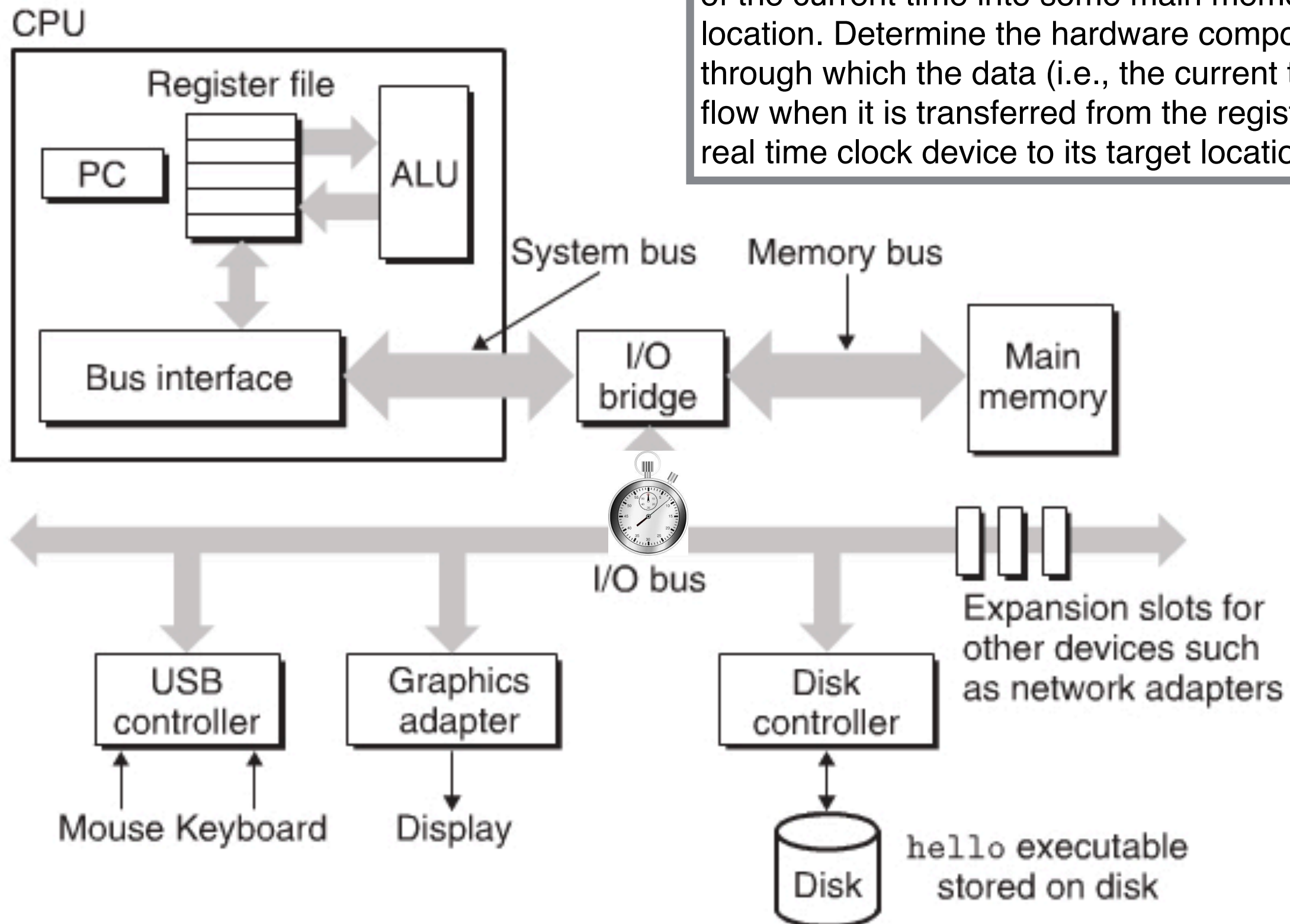
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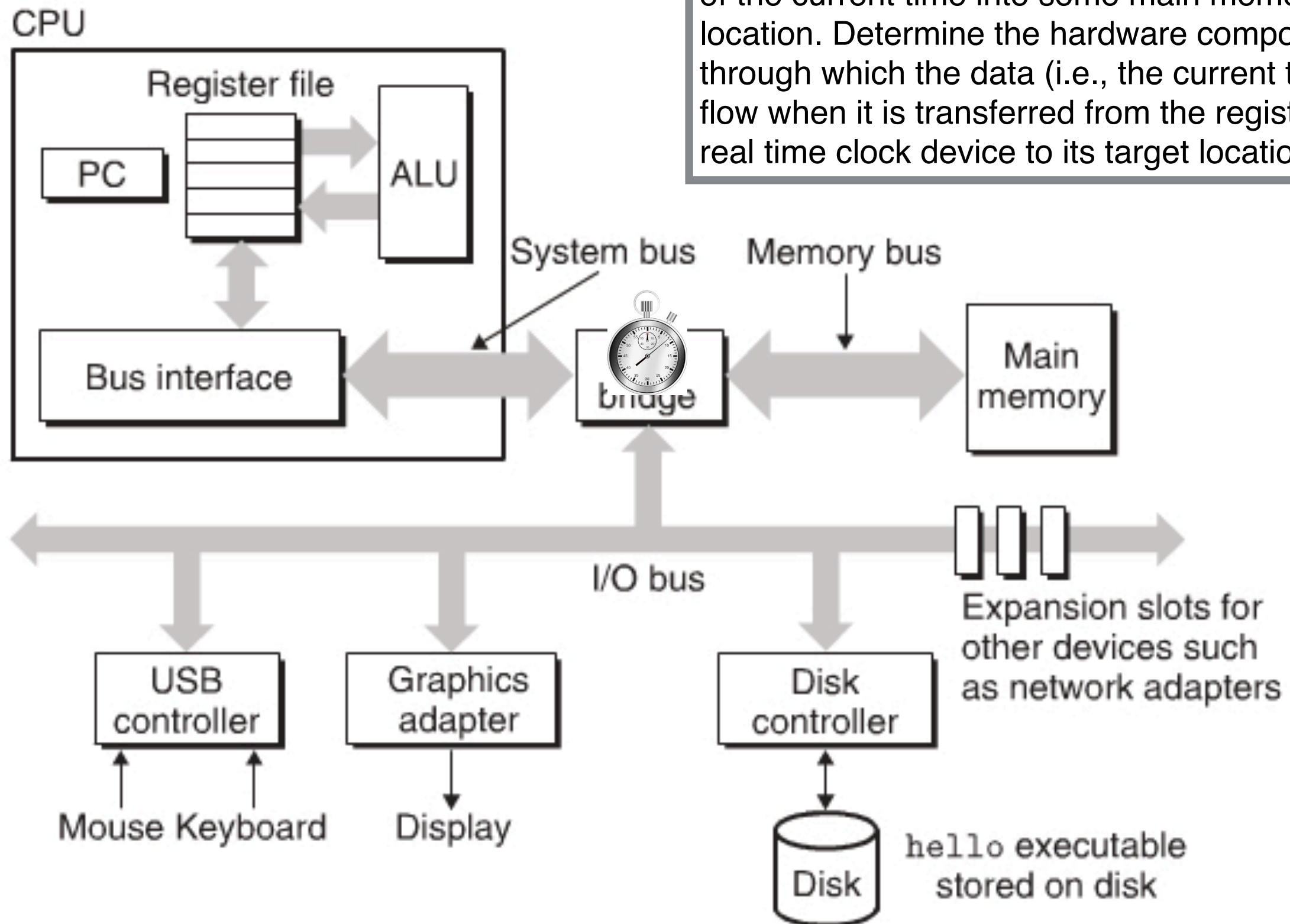
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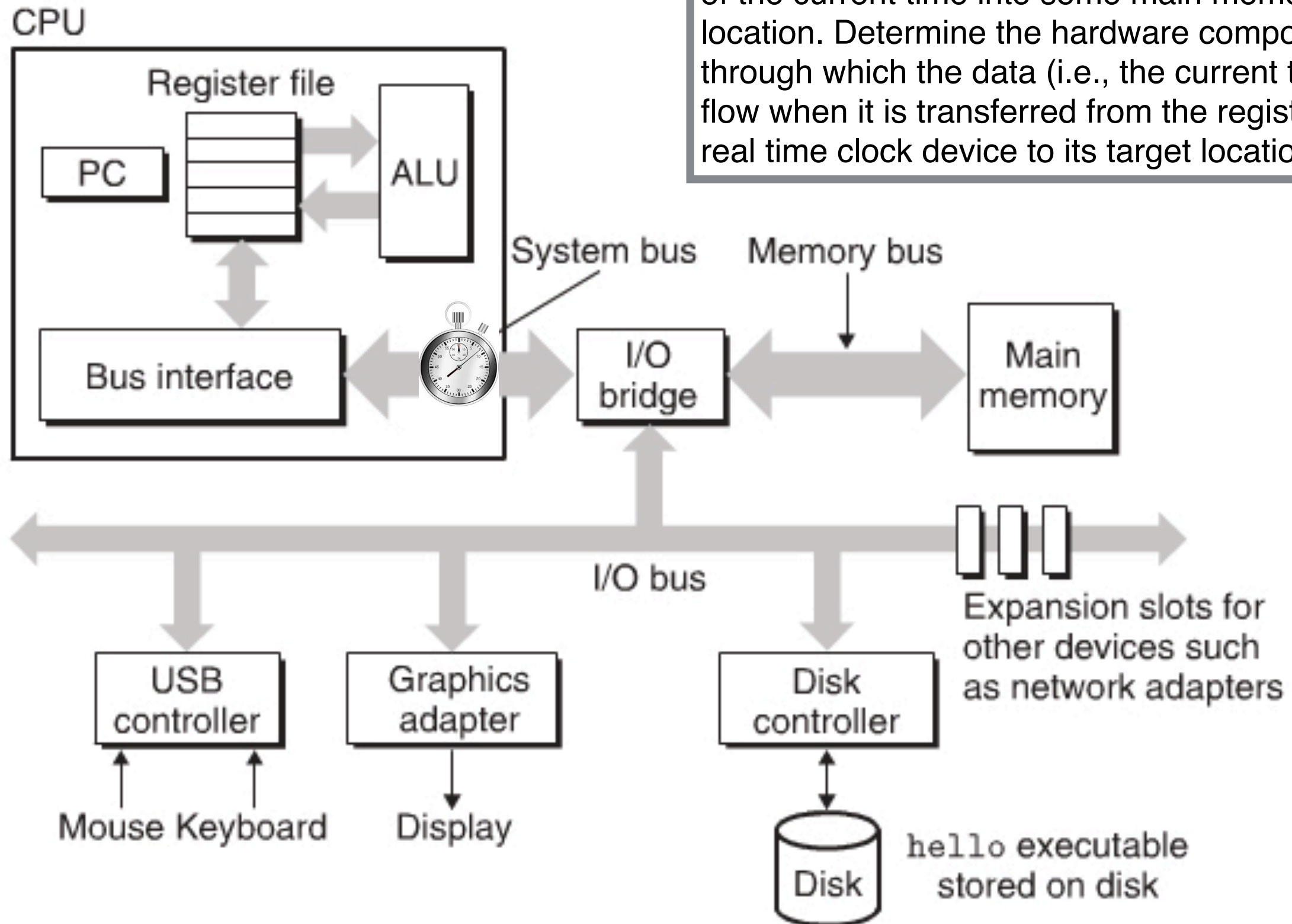
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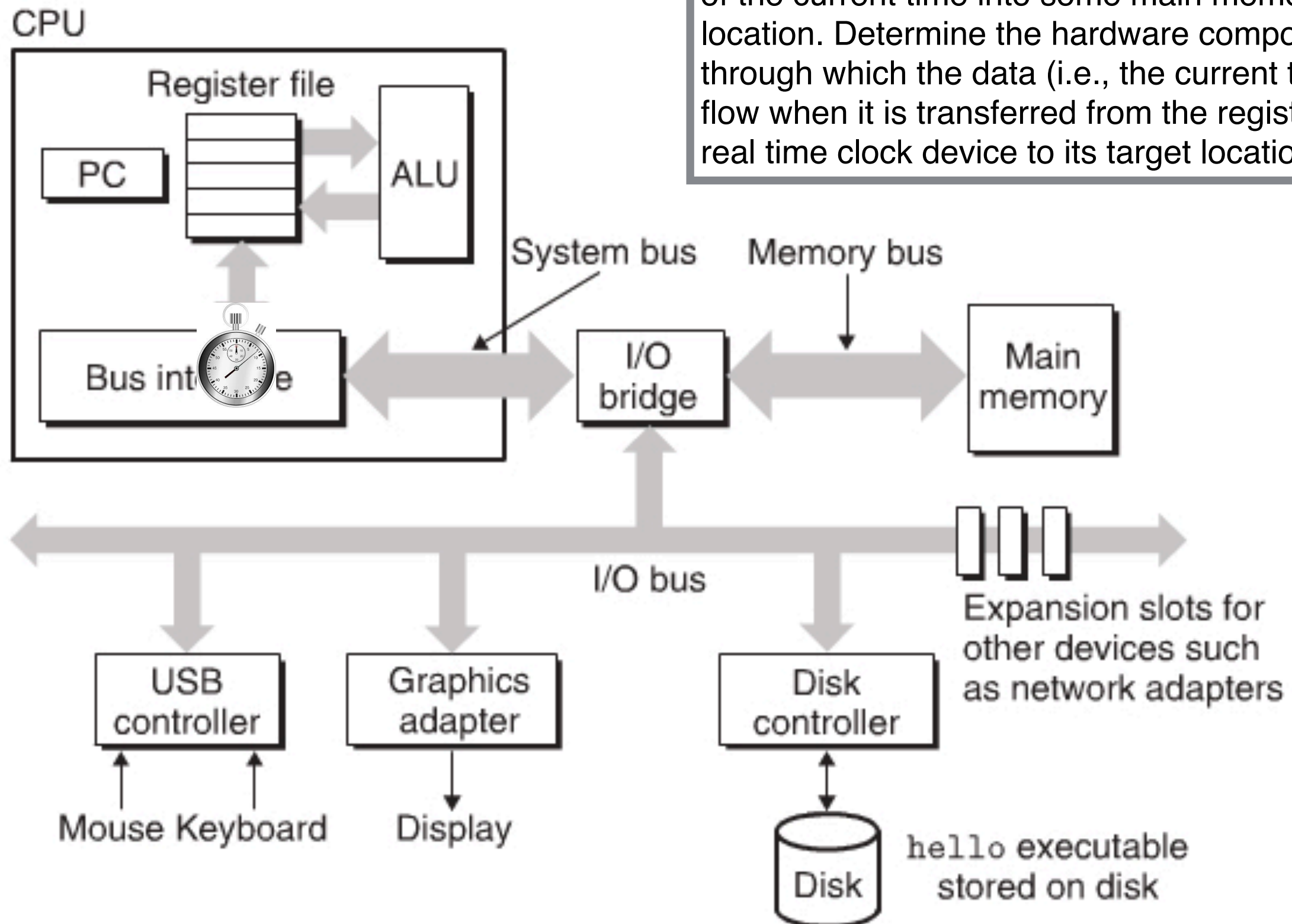
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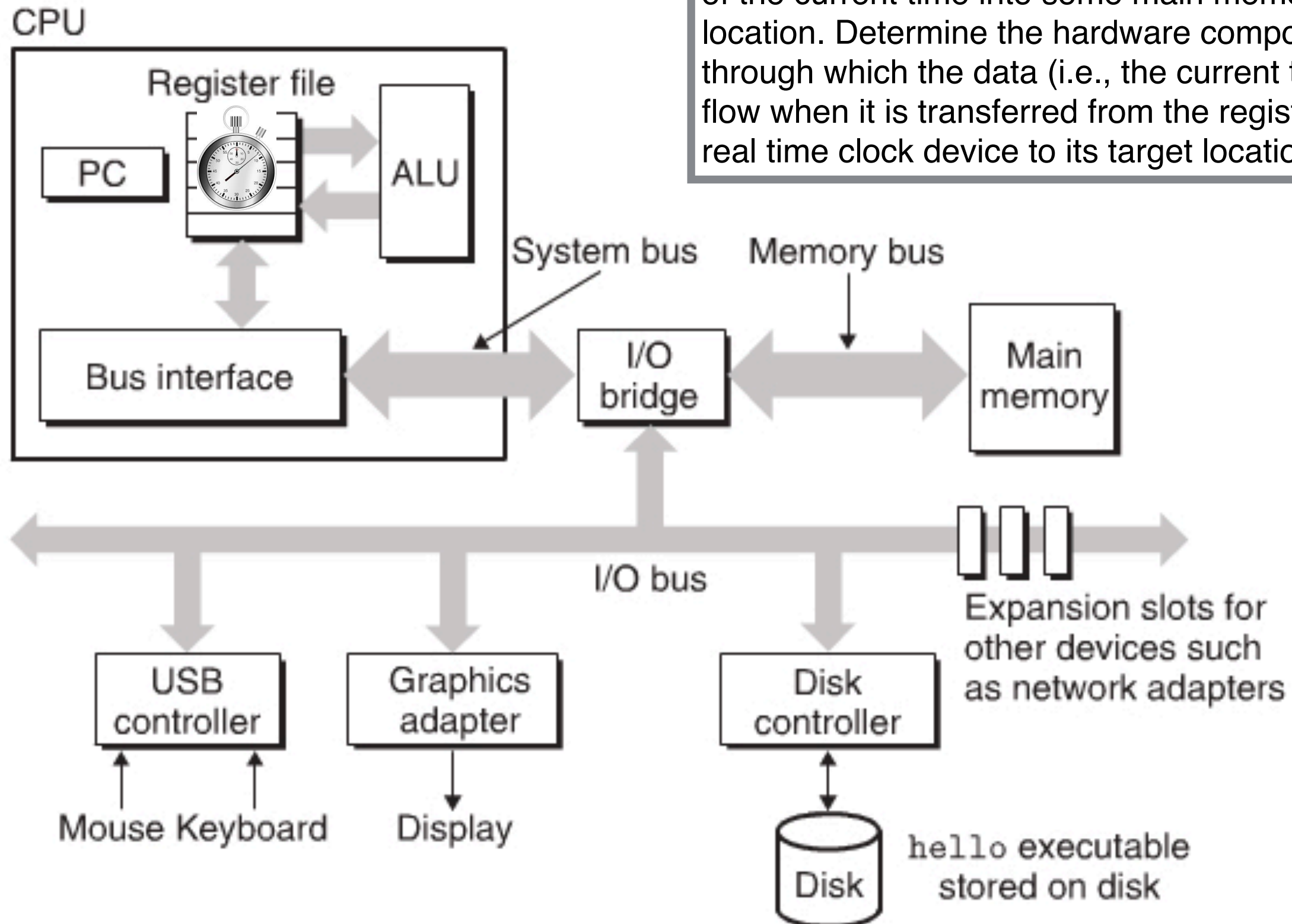
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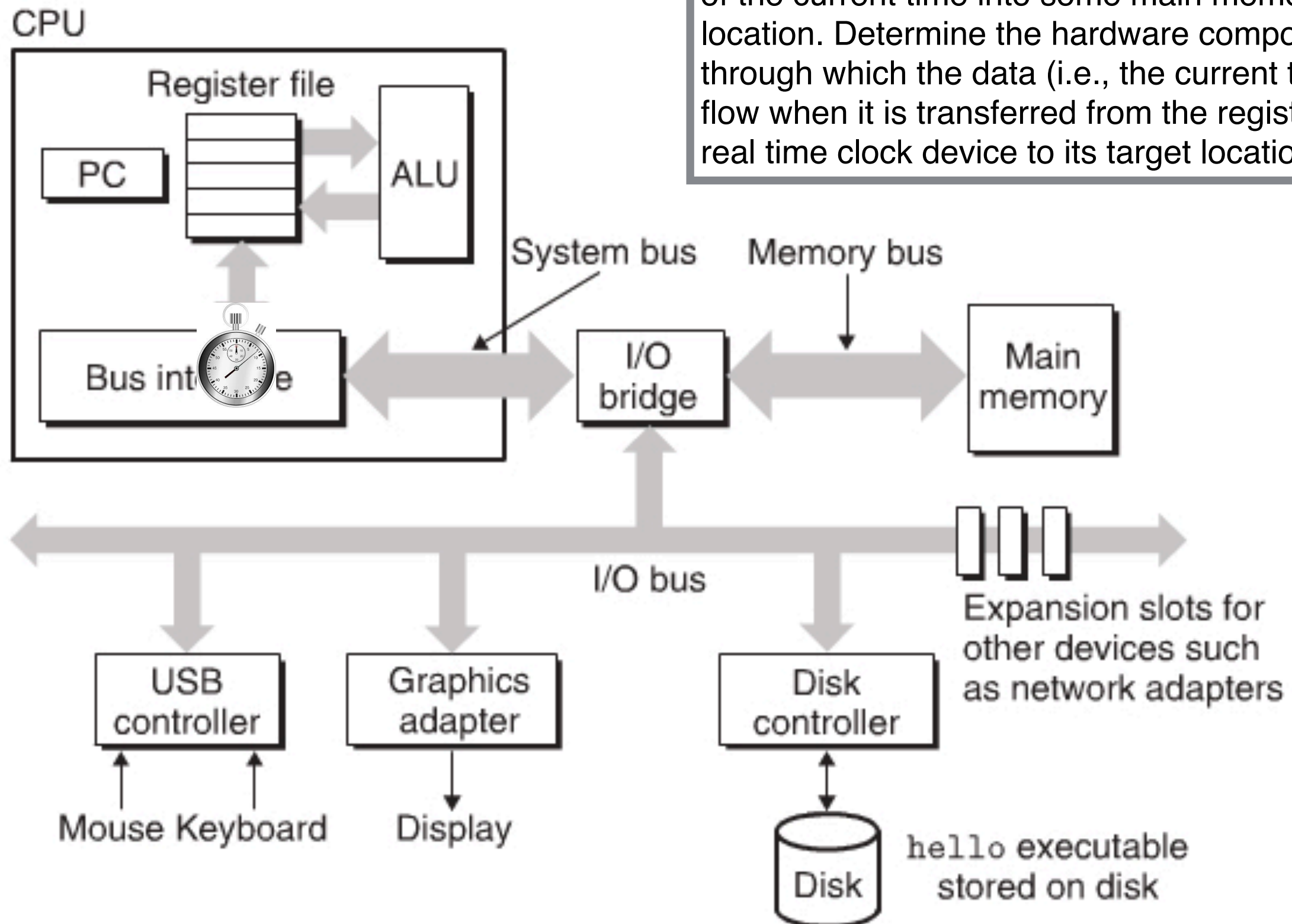
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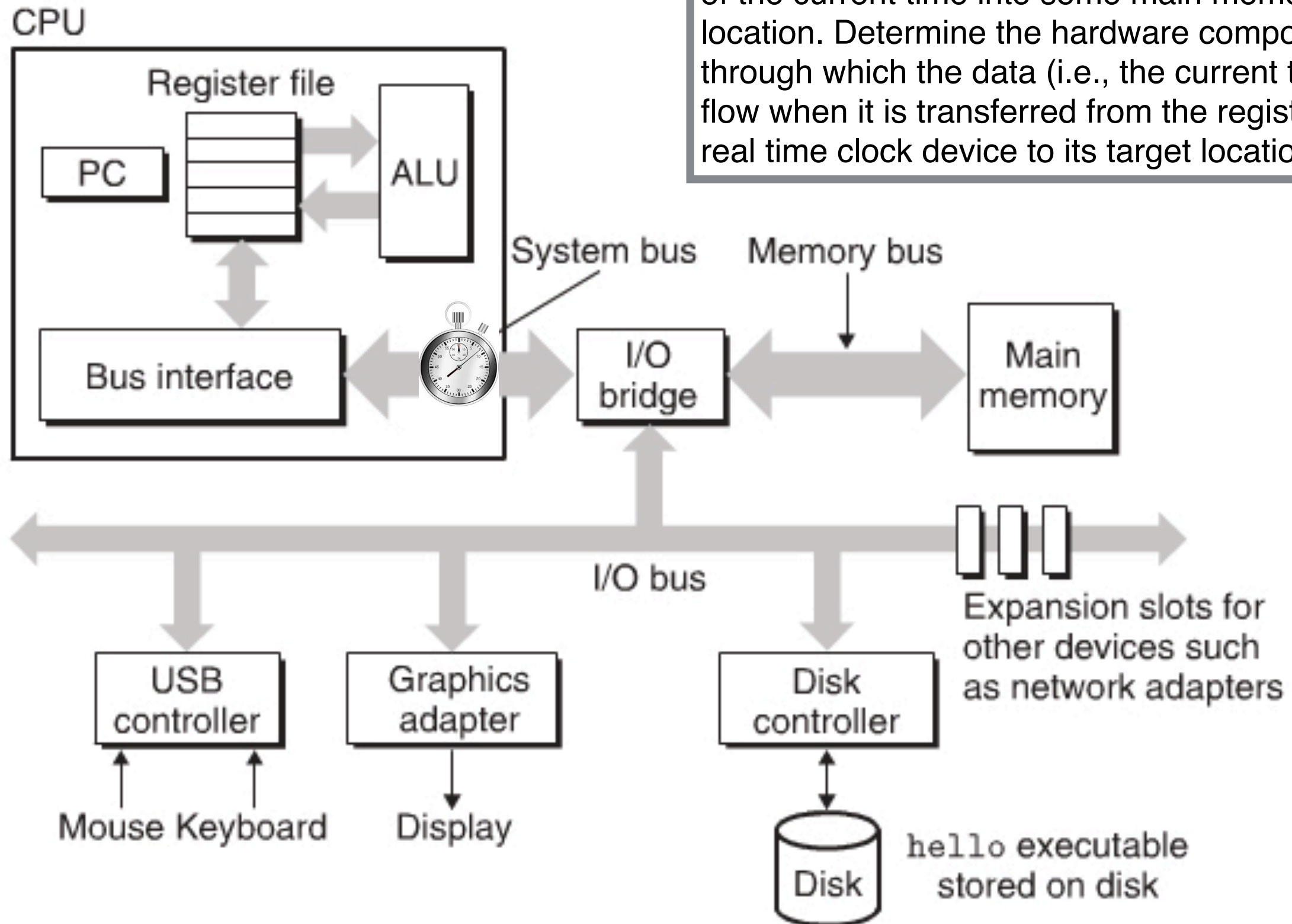
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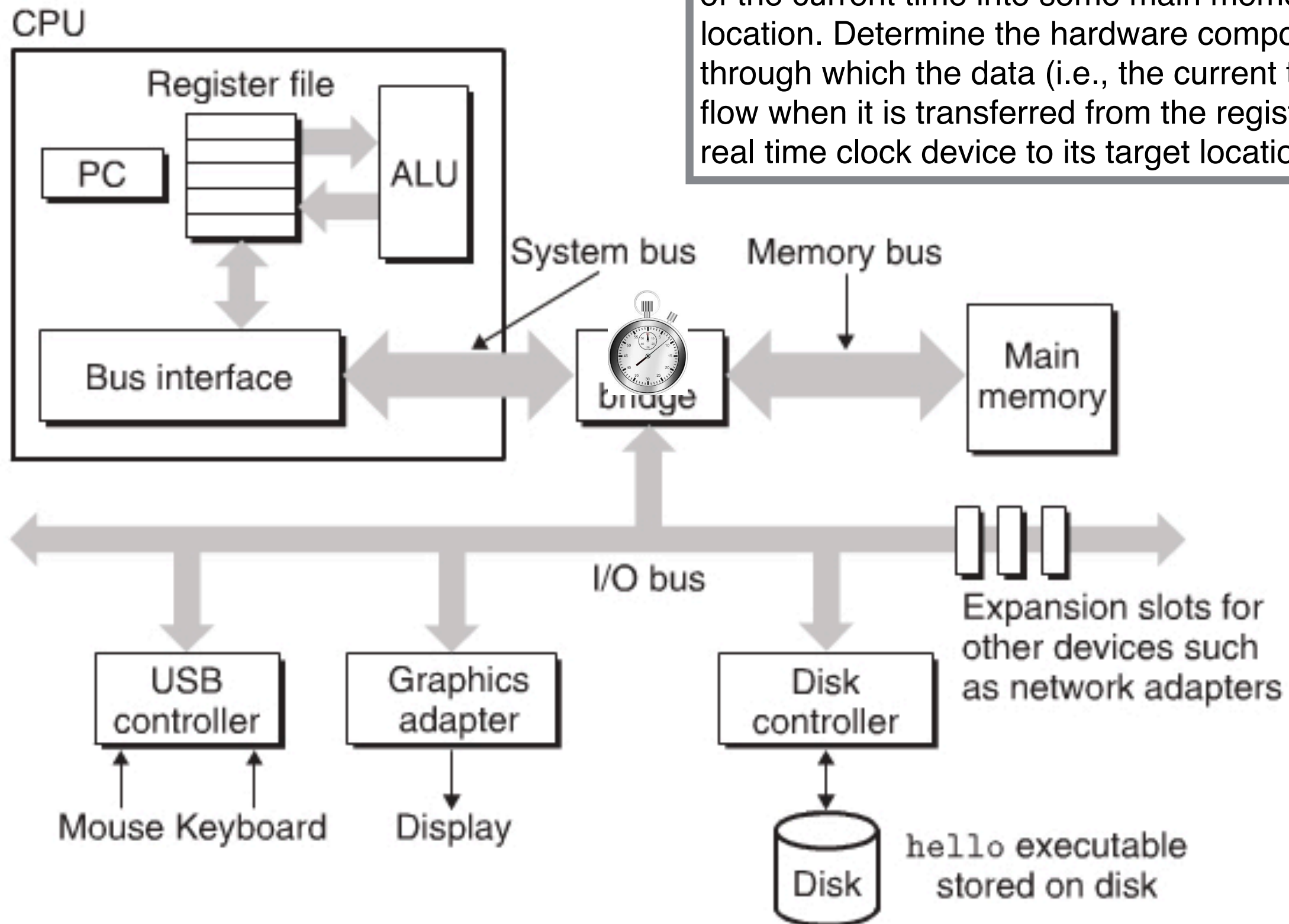
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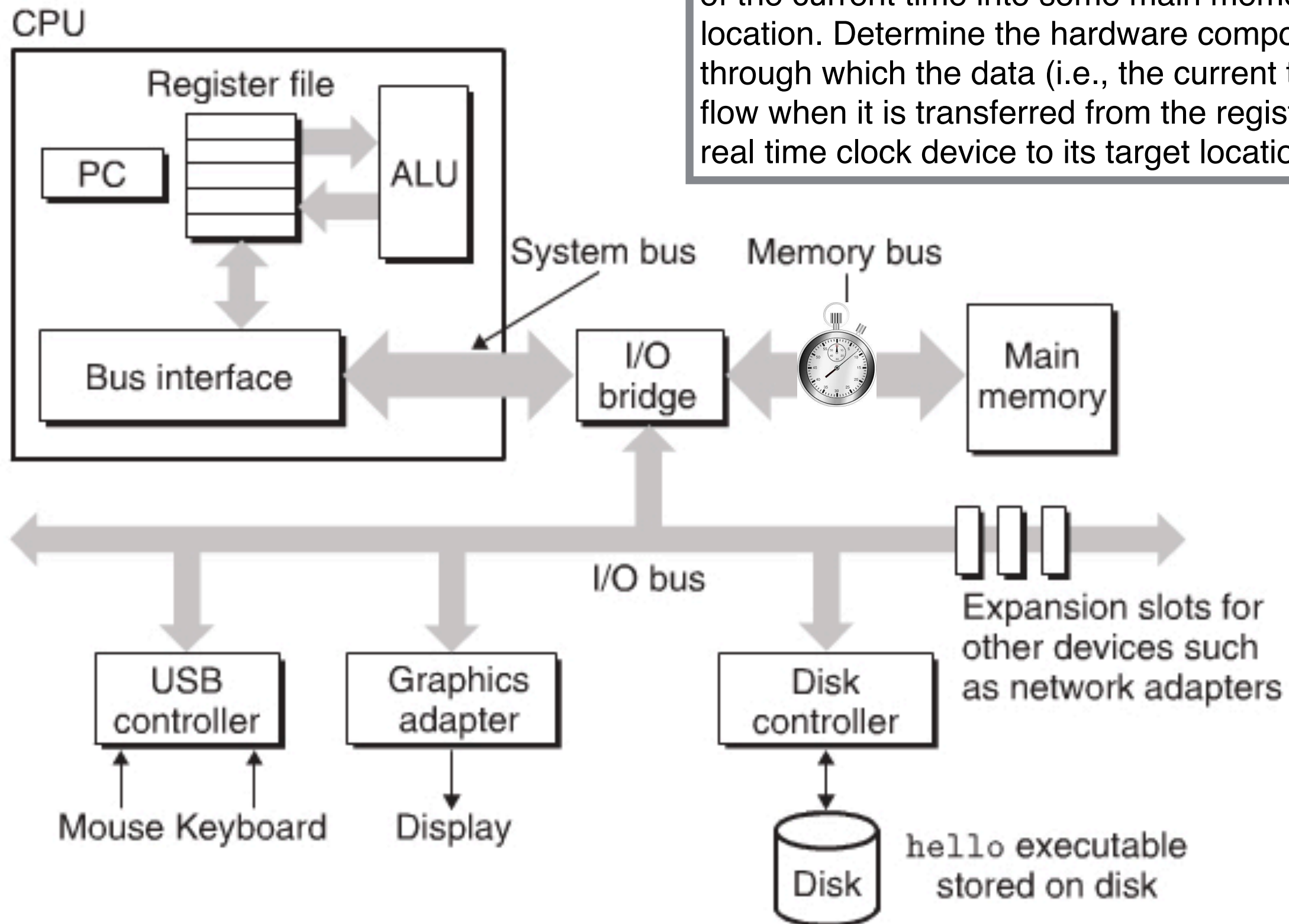
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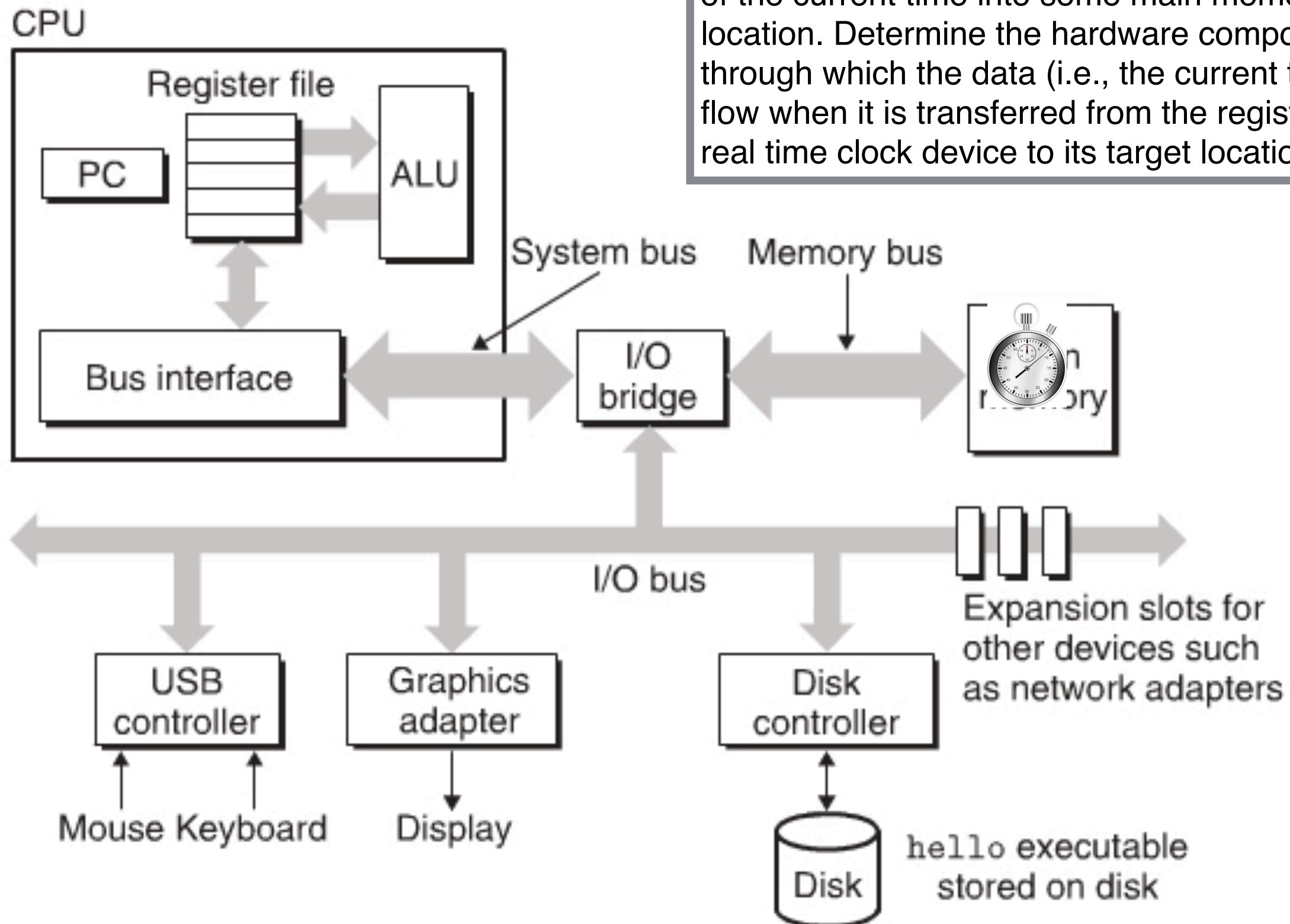
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