OPERATING SYSTEMS

Operating System and Structures

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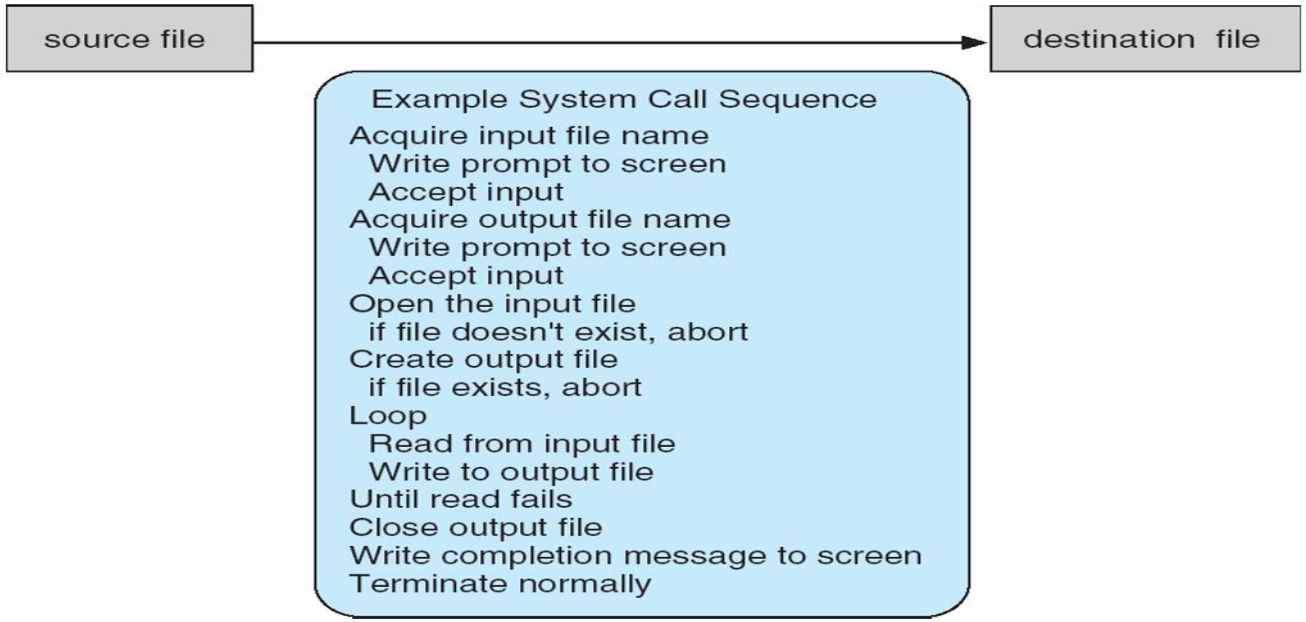
System Calls

- The **System Call** is the programmatic way in which a computer program requests a service from the kernel of the OS
- These are generally available as routines written in C/C++/Java



System Calls

- Systems Execute thousands of system calls per second.
- Most programmers never see this detail. Programmers design the program according to API. (Application Programming Interfaces)
- API are set of functions that are available to the application including the parameters to the functions and return values the programmer can expect
- The most common API are Win32 API, JavaAPI and POSIX API
- API defines a proper way for a developer to request services from another software/program

System Call Implementation

- A system library routine is called first
- It transforms the call to the system standard (native API) and traps to the kernel
- Control is taken by the kernel running in the system mode
- According to the service **"code"(indexed number)**, the interface invokes the responsible part of the Kernel
- Depending on the nature of the required service, the kernel may block the calling process
- After the call is finished, the calling process execution resumes obtaining the result (success/failure) as if an ordinary function was called

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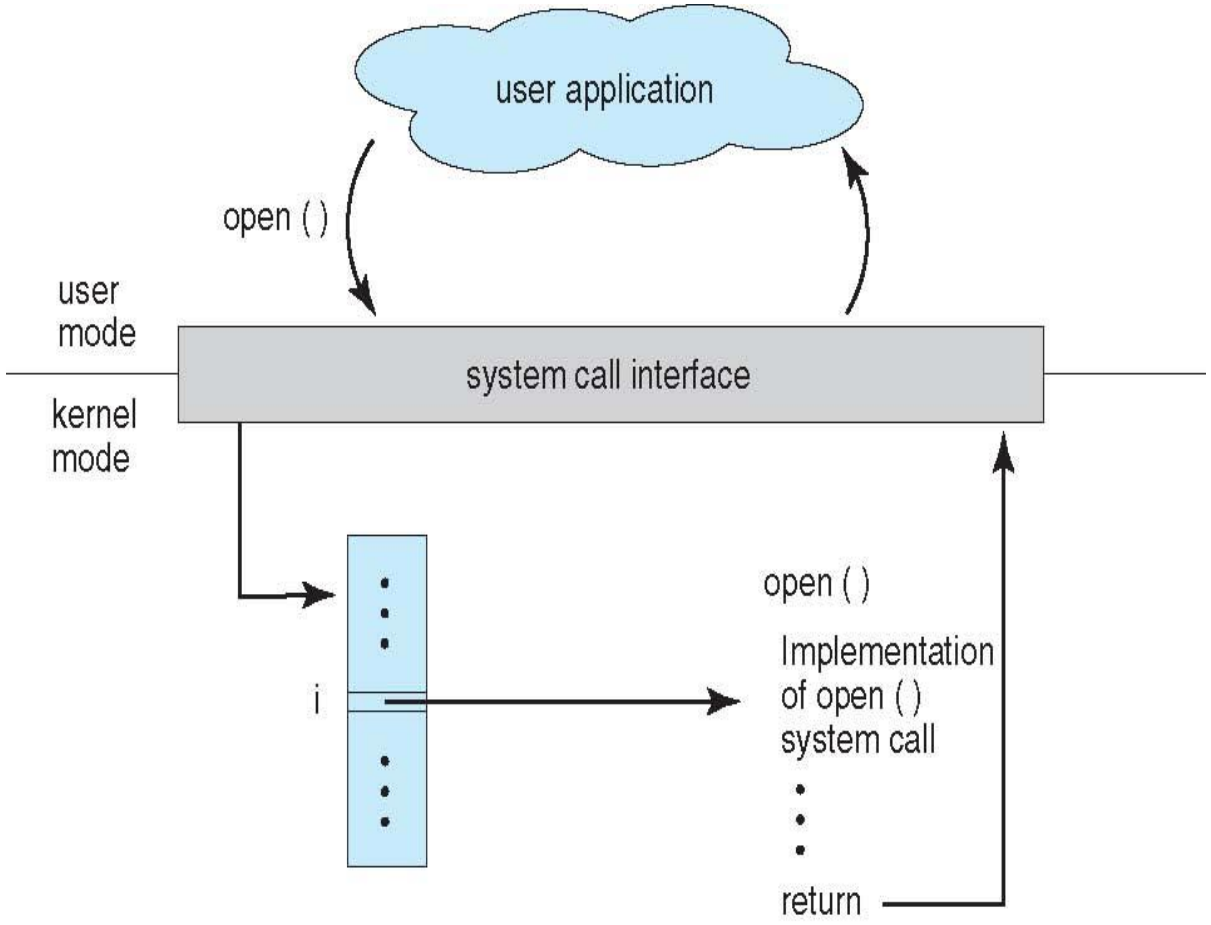
System Call Implementation



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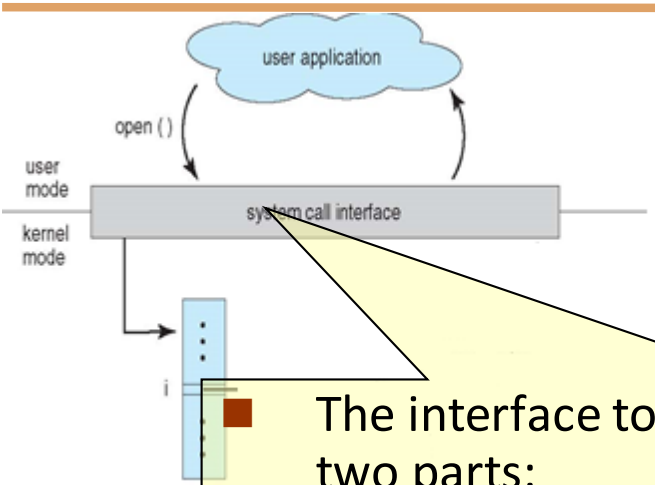
System Call Implementation



- The interface to the services provided by the OS has two parts:
  1. Higher language interface – a part of a system library
     - Executes in user mode
     - Implemented to accept a standard procedure call (API)
     - Traps to the Part 2
  2. Kernel part
     - Executes in system mode
     - Implements the required system service
     - May cause blocking the caller (forcing it to wait)
     - After completion returns back to Part 1 (may report the success or failure of the call)

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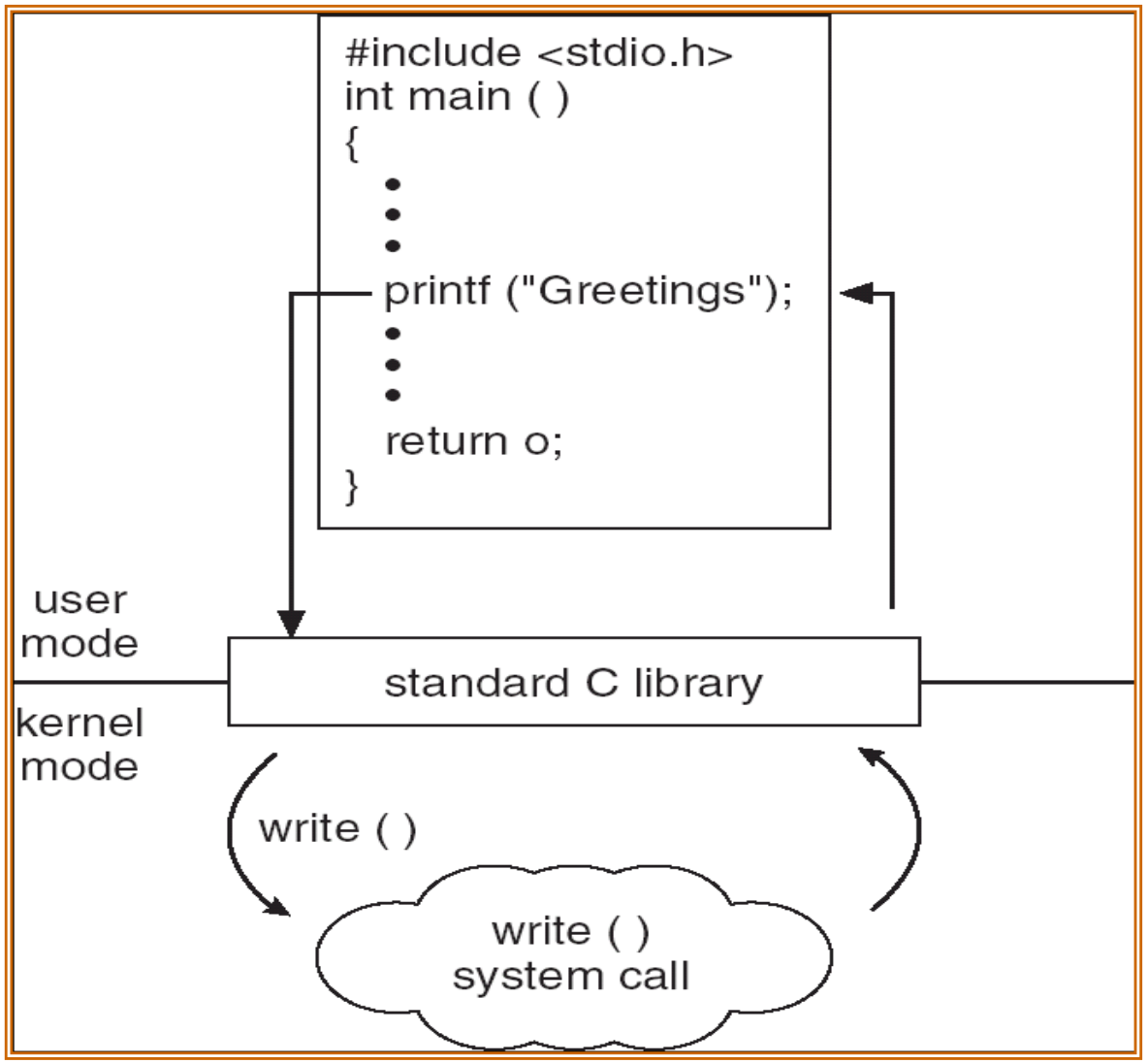
System Call Implementation



THANK YOU

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