Network Programming

Application Program Interface (API)

Note: **This class lecture will be recorded!**
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API

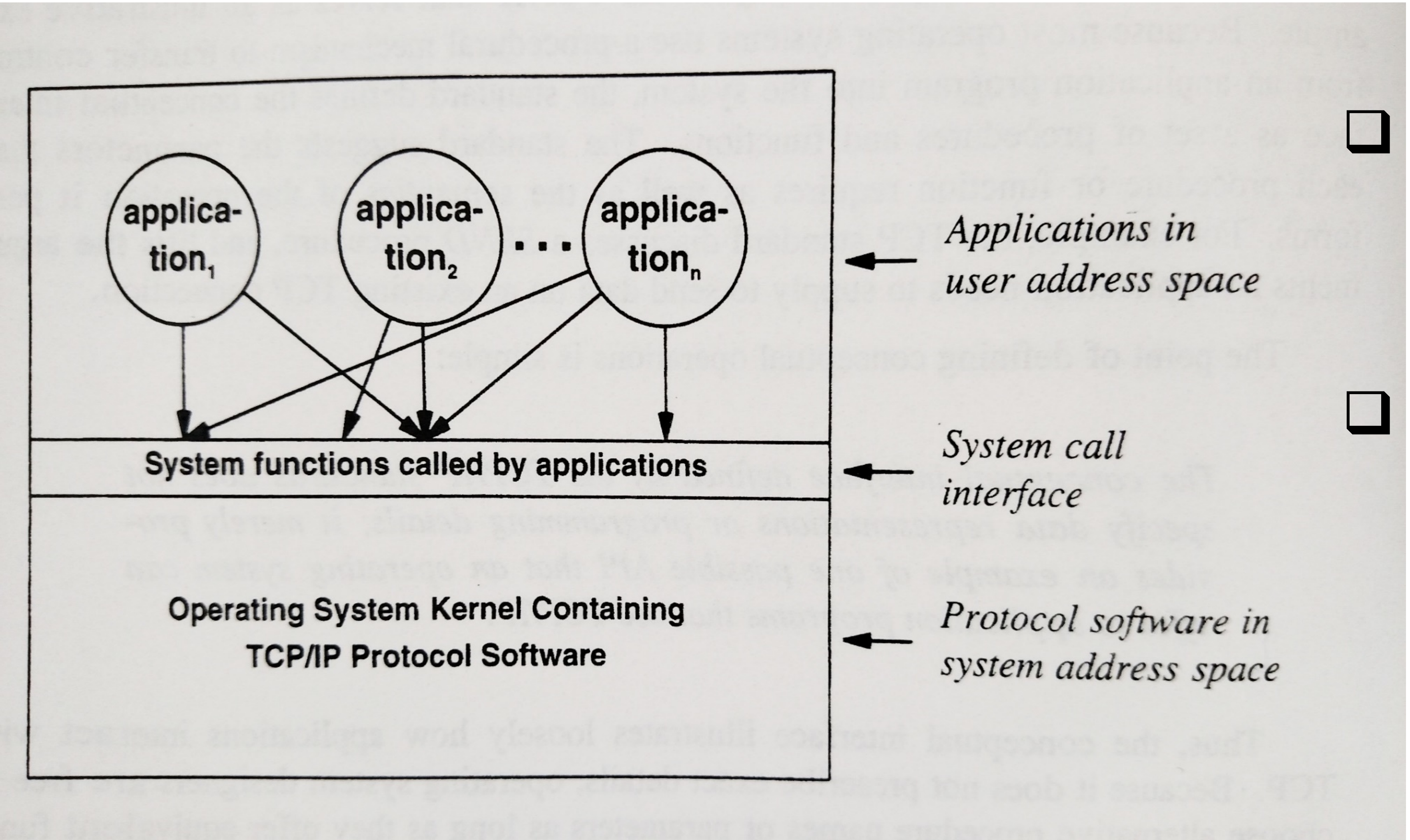
- What is an API?
- TCP/IP APIs
  - Socket API – UNIX – UC Berkeley
  - Windows Sockets
  - TLI (Transport Layer Interface) – System V UNIX – AT&T

TCP/IP Interface Operations

- Allocate local resources for communication
- Specify local and remote communication endpoints
- Initiate a connection (client)
- Send a datagram (client)
- Wait for an incoming connection (server)
- Send or receive data
- Determine when data arrives

TCP/IP Interface Operations (cont.)

- Generate urgent data
- Handle incoming urgent data
- Terminate a connection *gracefully*
  - **Q:** What does it mean to terminate *gracefully*?
- Handle connection termination from the remote site
- Abort communication
  - **Q:** Why might this be necessary?
- Handle error conditions or a connection abort
- Release local resources when communication finishes


applica-tion$_1$
applica-tion$_2$
. . .
applica-tion$_n$
System functions called by applications
Operating System Kernel Containing
TCP/IP Protocol Software
Applications in user address space
System call interface
Protocol software in system address space

- □ What is a *system call?*
- □ Why must the OS have control?

TCP/IP Interface

- Possible approaches
  - New system calls
  - Conventional I/O calls
- Most common approach
  - Conventional I/O calls
  - Hybrid ← Standard TCP/IP approach

UNIX I/O Calls

Operation	Description
open	Prepare a device or a file for I/O operations
close	Terminate use of a previously opened device or file
read	Read from an input device or file
write	Write to a device or file
lseek	Move to a specific position in a file or device
ioctl	Control a device or the software used to access it