

Threads

CSC 328 - Network Programming

Programs and Threads

- What is/are the advantage(s) of having multiple threads?
- What is/are the disadvantage(s) of having multiple threads?

Thread Safe Functions

- Not all functions are thread safe
- Some have a thread-safe alternative
- `chdir()` vs `opendir()`

POSIX Threads (pthreads)

- Popular implementation of threads
- Process address space shared by all threads
- pthread functions
 - return 0 or error number
 - use `strerror()`
- Thread ID (`pthread_t`)
 - `pthread_self()`
 - `pthread_equal()`

Thread Creation

- `pthread_create()`
- Data structures: thread ID, stack, PC value
- Can pass a single argument to a thread
 - How would you pass multiple values to a thread
- After a thread has been created, how to you know when it will be scheduled to run by the OS?

Thread Termination

- pthread termination
 - return from starting routine
 - `pthread_exit()`
 - main thread (process) ends
 - cancelled by another thread `pthread_cancel()`
- The main thread should call `pthread_join()` for each thread created
 - This is similar to calling `wait()` when forking child processes