

CISC 3320 MW3

C03a: Using System Calls

Hui Chen

Department of Computer & Information Science

CUNY Brooklyn College

Outline

- Using system calls and library APIs
 - Programming Linux/UNIX system call examples in C/C++
 - Programming Windows API examples in C/C++
- Compiling and linking

Recall: Examples of Windows and UNIX System Calls

- Loosely speaking, the examples show the APIs. The APIs wrap around system calls.

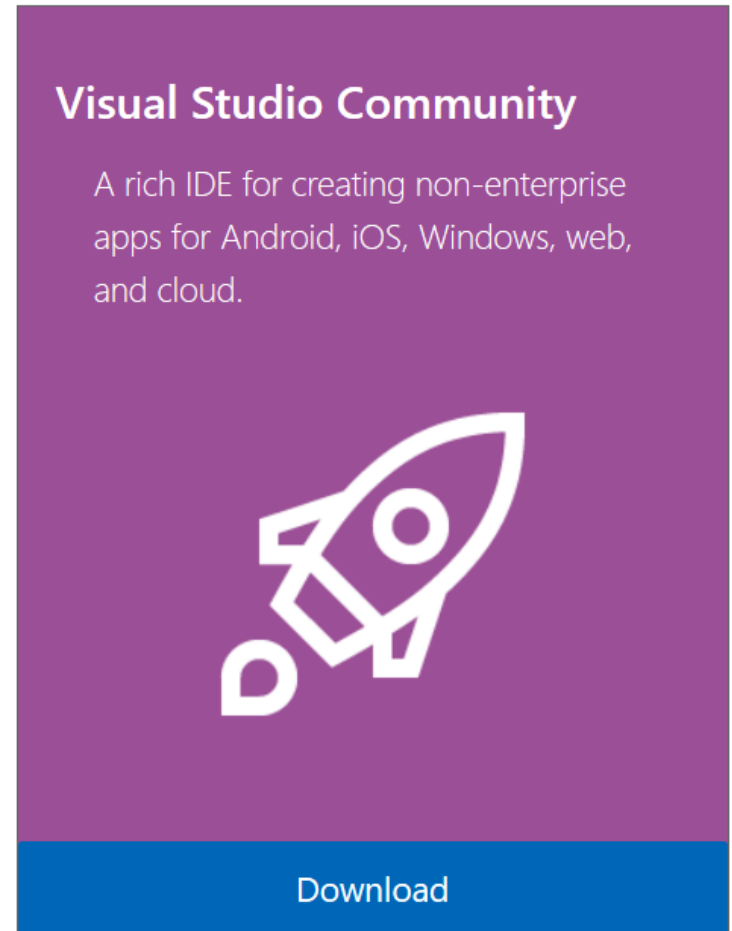
	Windows	Unix
Process Control	CreateProcess() ExitProcess() WaitForSingleObject()	fork() exit() wait()
File Manipulation	CreateFile() ReadFile() WriteFile() CloseHandle()	open() read() write() close()
Device Manipulation	SetConsoleMode() ReadConsole() WriteConsole()	ioctl() read() write()
Information Maintenance	GetCurrentProcessID() SetTimer() Sleep()	getpid() alarm() sleep()
Communication	CreatePipe() CreateFileMapping() MapViewOfFile()	pipe() shmget() mmap()
Protection	SetFileSecurity() InitializeSecurityDescriptor() SetSecurityDescriptorGroup()	chmod() umask() chown()

Preparation on Debian Linux

- First, become the root user
 - `su`
- Second, as root, install
 - `apt-get install build-essential`
 - `apt-get install manpages-dev`

Preparation on Windows

- Install Windows SDK and C/C++ compiler
 - Recommend: Microsoft Visual Studio
 - [Microsoft Visual Studio Community](#) is free to download and install



Preparation on Mac OS X

- First, register with the [Apple Developer Center](#)
- Recommend one of the two options
- Download and install
 - Xcode
- Download and install
 - Xcode
 - jGrasp (simpler, perhaps, easier to use than the Xcode IDE to many)

Compilation and Linking

- In this lecture, we use Makefile and compile and link programs from the Command Line
- See examples

API Documentation

- In Linux/UNIX/Mac OS X, use "man"
 - Examples
 - man 2 read
 - man 2 fork
 - ...
- In Windows, use the MSDN documentation

Example Programs

- Explore a few example programs

Questions?

- Using system calls (or wrapping library APIs) in your programs
 - Windows
 - Linux/UNIX
- Compile and link programs