

What is an Operating System

AND WHY MIGHT I CARE?

What does Wikipedia say?

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usually require – The other option is “Bare Metal” programming where you write **everything** yourself.

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Possible Definition

A system program that allows the user to run their own programs without having to reinvent everything from scratch.

What it is not

Does not need a graphical user interface.

One size fits all

Limited to run on only one hardware platform.

Common Examples

DOS

Windows (3.1, XP, Vista, ME, 7, 8, 10)

*inux (Unix, Linux of a thousand flavors, ...)

Mac OS

Android

iOS

Less Common Examples

FreeRTOS

Micrium (μ C/OS-II or III)

VxWorks

uClinux

PowerPack/embOS

QNX

Deeper Dive

Provides:

- User interface to start user programs
- Possibly a way to control running programs
 - Status (like Windows Task Manager)
 - Terminate
 - Messaging (Like *nix signals)
- A library of common routines to access OS
 - Malloc, fopen, getc,

Types of Operating Systems

GUI – Uses graphics and icons and is commonly navigated by using a mouse.

Multi-user – Allows more than one user to use a computer at the same time.

Multiprocessing – Supports running programs on more than one CPU/Core.

Multitasking/ Multithreading - Allows multiple software programs to run at the same time on one processor.

Realtime – Guarantees that a given activity can be done in a given time.

So what is “Arduino”

It has a library of common functions.

It has a way to run different user programs (by new download)

But it does not allow programs to be run and controlled on the fly.

Therefore NOT an Operating System. (?!)

What is RTOS/uCos/FreeRTOS

Library of routines.

Guarantee timeliness of execution.

- Unlike *linux or Windows

Multithread support.

No way to load programs on the fly.

So why are these called operating systems?

- Good question!

So what is ROS?

Stay tuned!

New Definition

Some sort of software package that you did not write that allows you to use a processor effectively. (So maybe Arduino is an OS?)

Or

"I know it when I see it"