

Containerized Cross Platform Development for the New Age Polyglot

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Background

Containers

Operating System Virtualization method for running multiple isolated systems on a host using the host core—the kernel.

Docker

Leverage system containers and shell to build reproducible and shippable environments.

QEMU

Emulator that performs hardware virtualization for many architectures. It is open-source and freely available on multiple Linux distribution package managers.

Cross compiling

Compiling binaries for a different architecture than the one where the compiler is hosted, i.e., x86 compiling binaries for Arm.

Embedded Systems

An embedded system is a controller programmed with a dedicated function in mind and with a restricted toolset and hardware promoting function and security over reusability.



Development Workflow

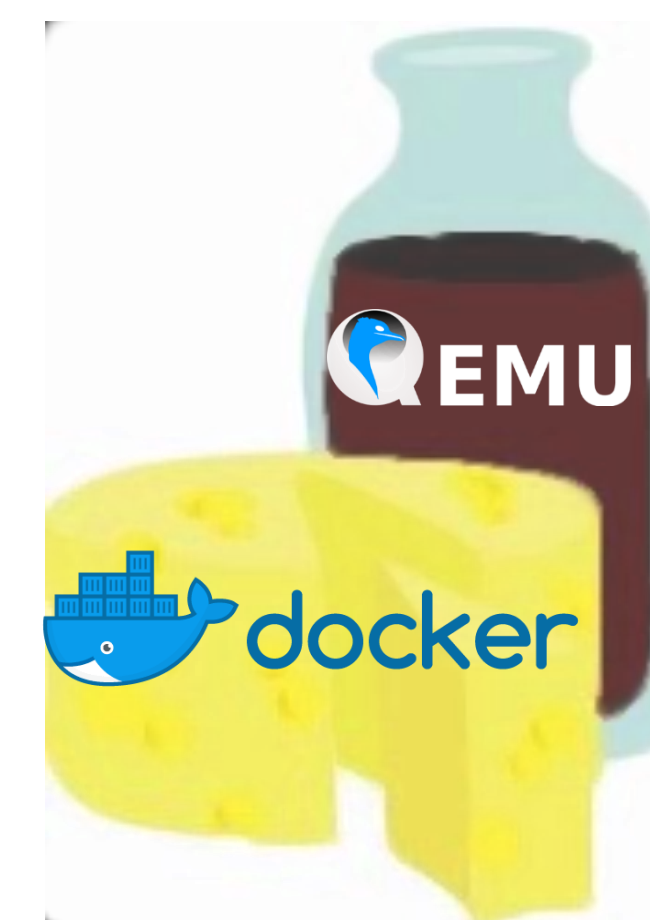


Software Developers Desire:

- Low dependency count and good portability
- Rapid deployment and testing.
- Short learning curve.

Architecture Agnostic Continuous Development & Delivery

Docker and **QEMU** allow developer to deliver reproducible environments for any architecture.



But QEMU in emulation mode only allows emulation of a single physical core, yielding very low throughput during compilation.

Recent developments have allowed the integration of **QEMU** in **interpreted** mode.

This allows the running of other architecture binaries on a the bare Host

But there is a learning curve and more maintenance is induced by adding new tooling.

N2Ndocker “Any->Any Docker environment”

- Using a single “Dockerfile”, allows the building of a reproducible environment as close to the target platform.
- Can be used to build with a fully featured development environment, and a more barebones image to test the resulting binary.
- Is compatible with network shared storage and retain user permissions on files.
- Wraps the Docker interface to avoid the need to learn new tools.
- Hides the QEMU interface to simplify usage
- Single file that is compatible with BASH can be imported as part of most CI/ CD workflow
- 2-package dependency only:
 - Docker
 - QEMU.