# 1. 引言

## 1.1 特点

QEMU是一个快速的处理器的模拟器，采用动态转换，以达到更好的仿真速度。

QEMU两个工作模式：

1. 全系统模拟。在此工作模式，QEMU模拟一个完整的系统（例如，PC），包括一个处理器或者多个处理器，或者多个外设。它可以被用来运行不同的操作系统，而不用重启PC或者调试系统代码。
2. 用户模拟。QEMU可以启动在一个CPU上编译另一个CPU。可以被用来启动Wine Windows API模拟器或者简化交叉编译或交叉调试。

QEMU有下面的特点：

1. QEMU可以在没有host内核驱动的情况下运行，仍然能够获得可以接受的性能。它对原生代码使用动态转译以提供合理的速度。
2. 它适用于多种操作系统（GNU/Linux，\*BSD，Mac OS X， Windows）和体系结构。
3. 执行FPU的精确软件仿真

QEMU用户模式仿真具有下面的特点：

1. 通用Linux系统调用转换器，包括大部分ioctls。
2. 通过使用原生CPU的clone()，克隆模拟器，为线程使用linux调度器。
3. 通过将主机信号重新映射到目标信号来实现精确信号处理。

QEMU full system emulation has the following features:

1. QEMU uses a full software MMU for maximum portability.
2. QEMU can optionally use an in-kernel accelerator, like kvm. The accelerators execute most of the guest code natively, while continuing to emulate the rest of the machine.
3. Various hardware devices can be emulated and in some cases, host devices (e.g. serial and parallel ports, USB, drives) can be used transparently by the guest Operating System. Host device passthrough can be used for talking to external physical peripherals (e.g. a webcam, modem or tape drive).
4. Symmetric multiprocessing (SMP) support. Currently, an in-kernel accelerator is required to use more than one host CPU for emulation.

# 3 非PC的QEMU系统模拟器

## 3.5 ARM系统模拟器

使用可执行的qemu-system-arm来模拟ARM机器。 ARM Integrator / CP板用以下设备进行仿真：

* ARM926E, ARM1026E, ARM946E, ARM1136 or Cortex-A8 CPU
* 2 PL011 UARTs
* SMC 91c111 Ethernet adapter
* PL110 LCD controller
* PL050 KMI with PS/2 keyboard and mouse.
* PL181 MultiMedia Card Interface with SD card.

ARM Versatile基板被仿真具有下面的设备：

* ARM926E, ARM1136 or Cortex-A8 CPU
* PL190 Vectored Interrupt Controller
* Four PL011 UARTs
* SMC 91c111 Ethernet adapter
* PL110 LCD controller
* PL050 KMI with PS/2 keyboard and mouse.
* PCI host bridge. Note the emulated PCI bridge only provides access to PCI memory space. It does not provide access to PCI IO space. This means some devices (eg. ne2k\_pci NIC) are not usable, and others (eg. rtl8139 NIC) are only usable when the guest drivers use the memory mapped control registers.
* PCI OHCI USB controller.
* LSI53C895A PCI SCSI Host Bus Adapter with hard disk and CD-ROM devices.
* PL181 MultiMedia Card Interface with SD card.