emulator

each guest instruction is fetched, decoded and emulated in isolation
this is done every time the guest tries to execute it

对比

If the translated code is kept in a cache and reused whenever the the guest is trying to execute it again, the cost of decoding the guest instructions is thus amortized.

The idea of binary translation is to first translate the guest code into the equivalent host code for the virtual machine, and then jump at the translated code

binary translation

the translated code can be optimized during the translation, since our emulator now looks at more than a single guest instruction at a time.

Hardware Assisted Virtualization

In the hardware-assisted virtualization technique we try to execute the instructions of the target machine directly on the host processor, as much as possible.