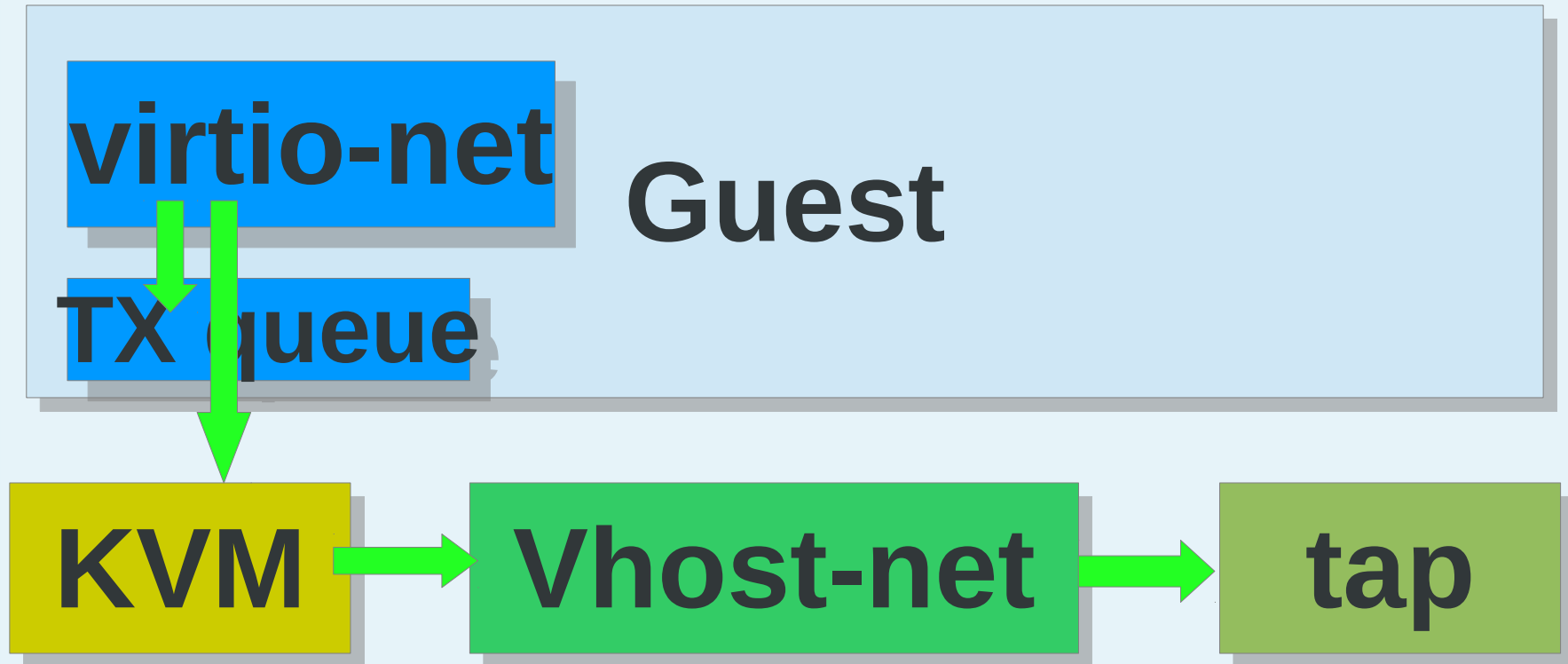


Virtio & networking

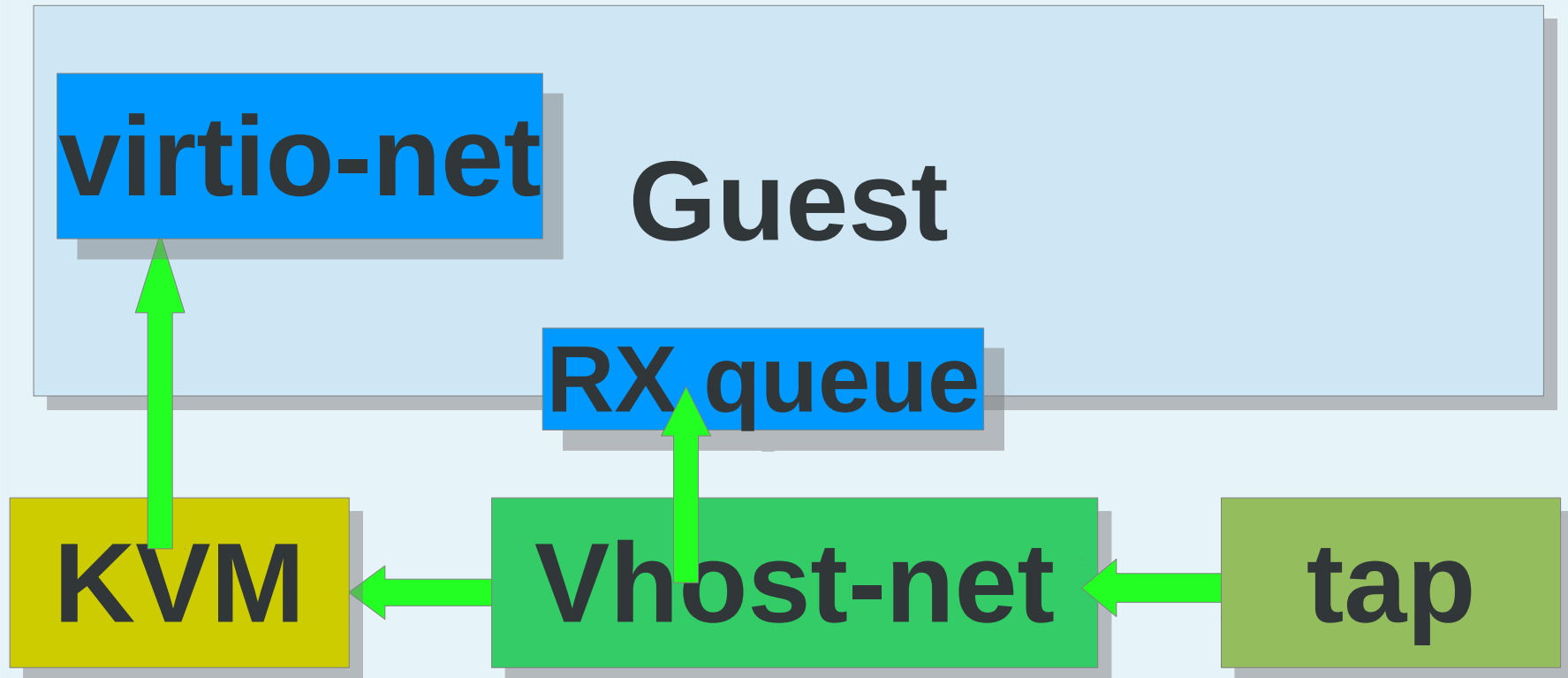
Michael S. Tsirkin Red Hat

status and challenges

Virtio-net

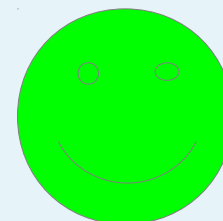


RX



Performance

- Line rate under many workloads
- But not always
- Progress



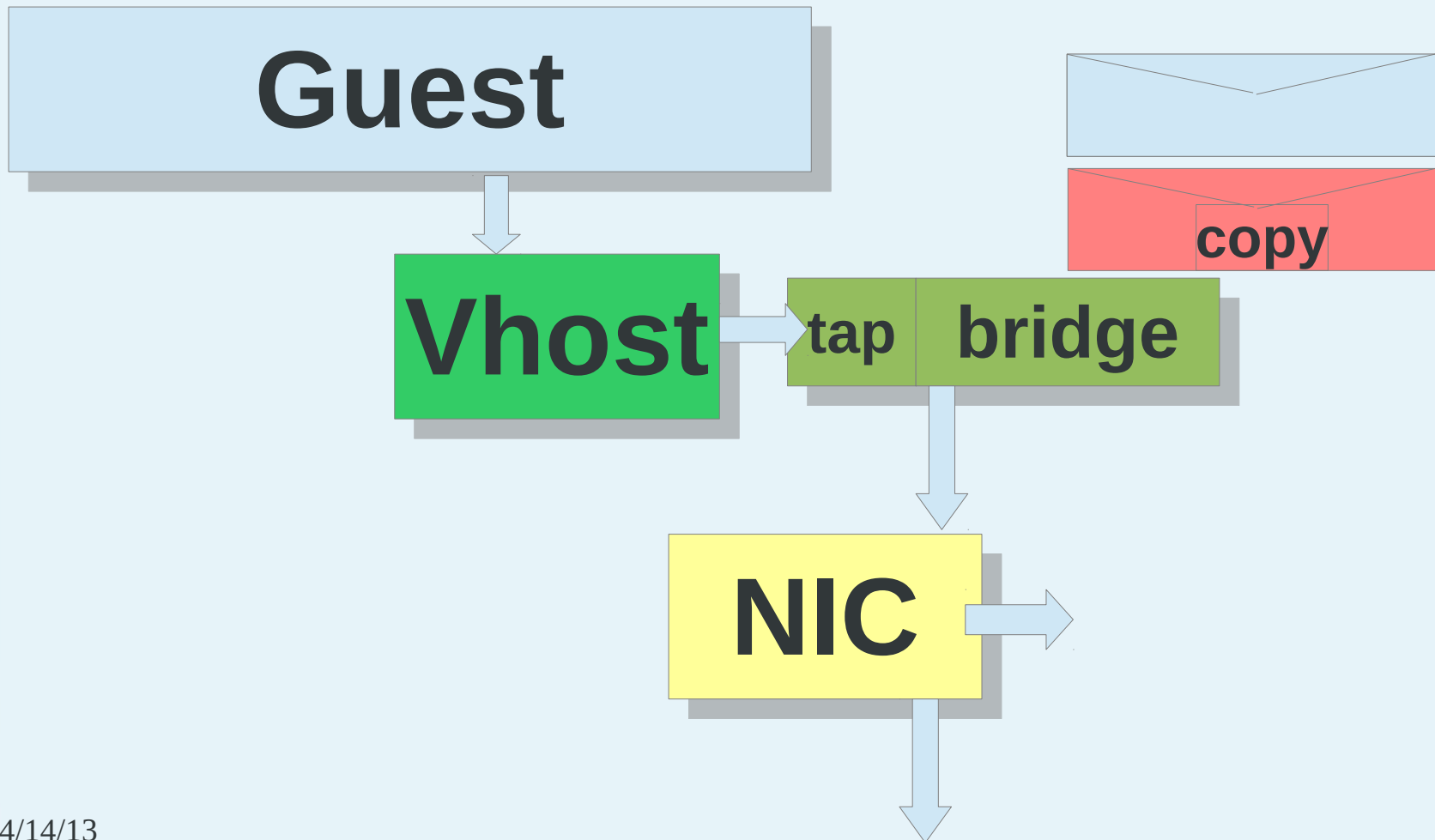
Perf top

copy_user_generic_string 25%

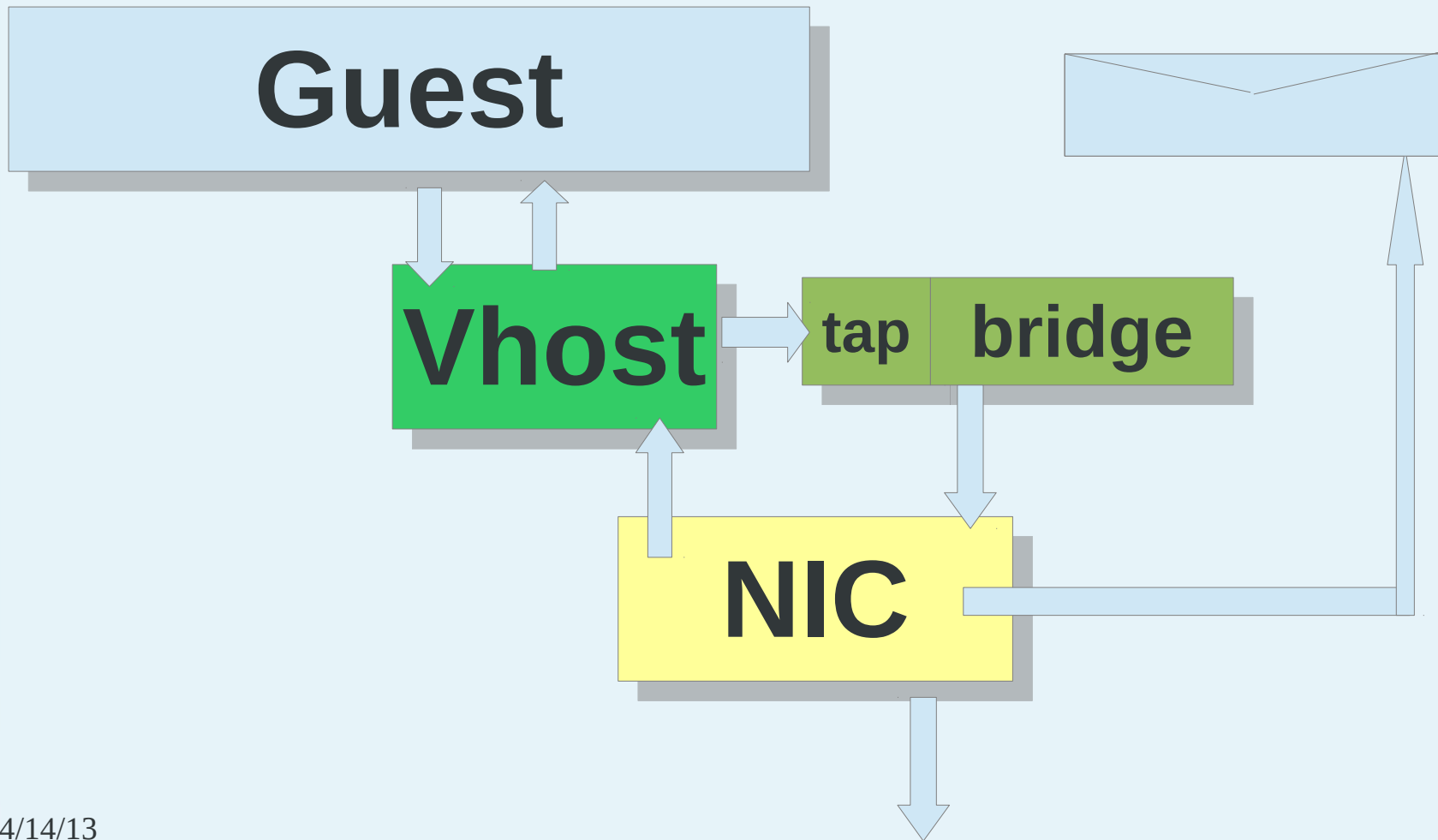
?



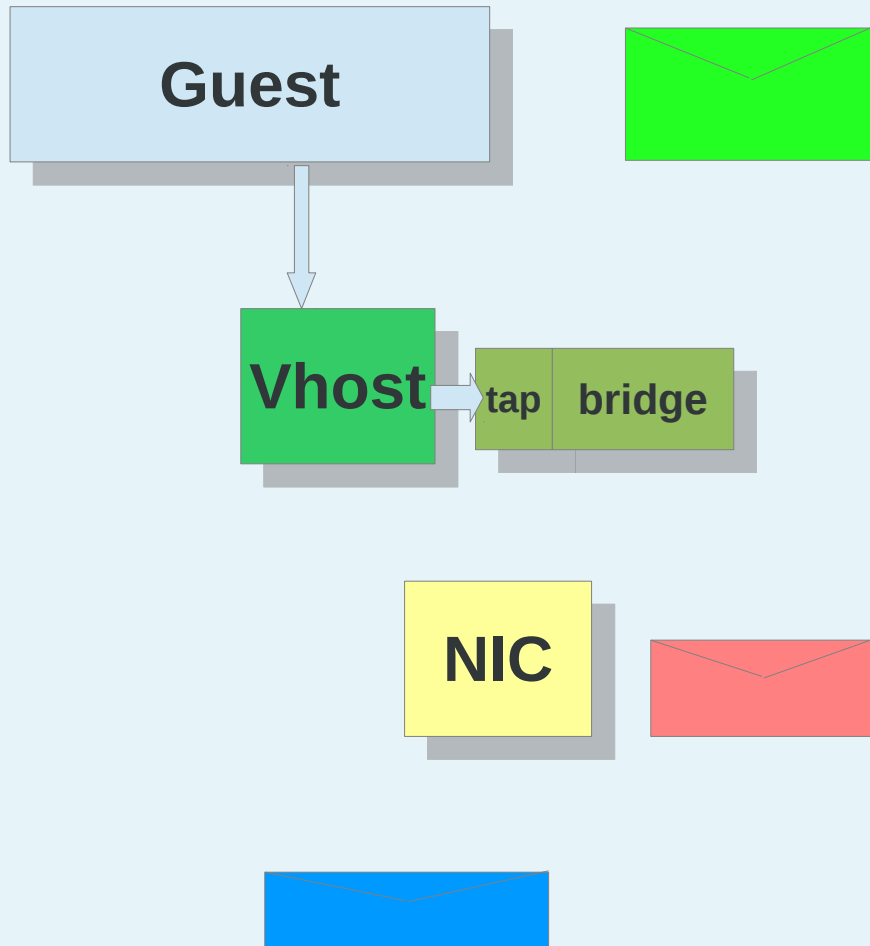
Data copy



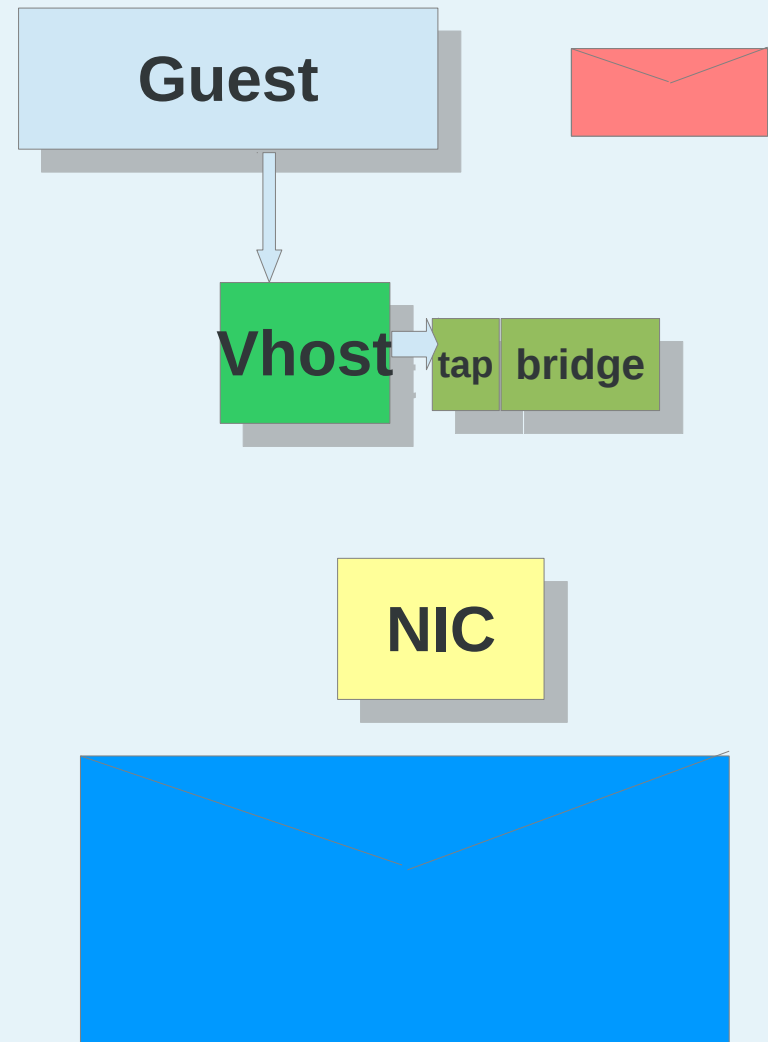
Zero copy



Copy



Zerocopy

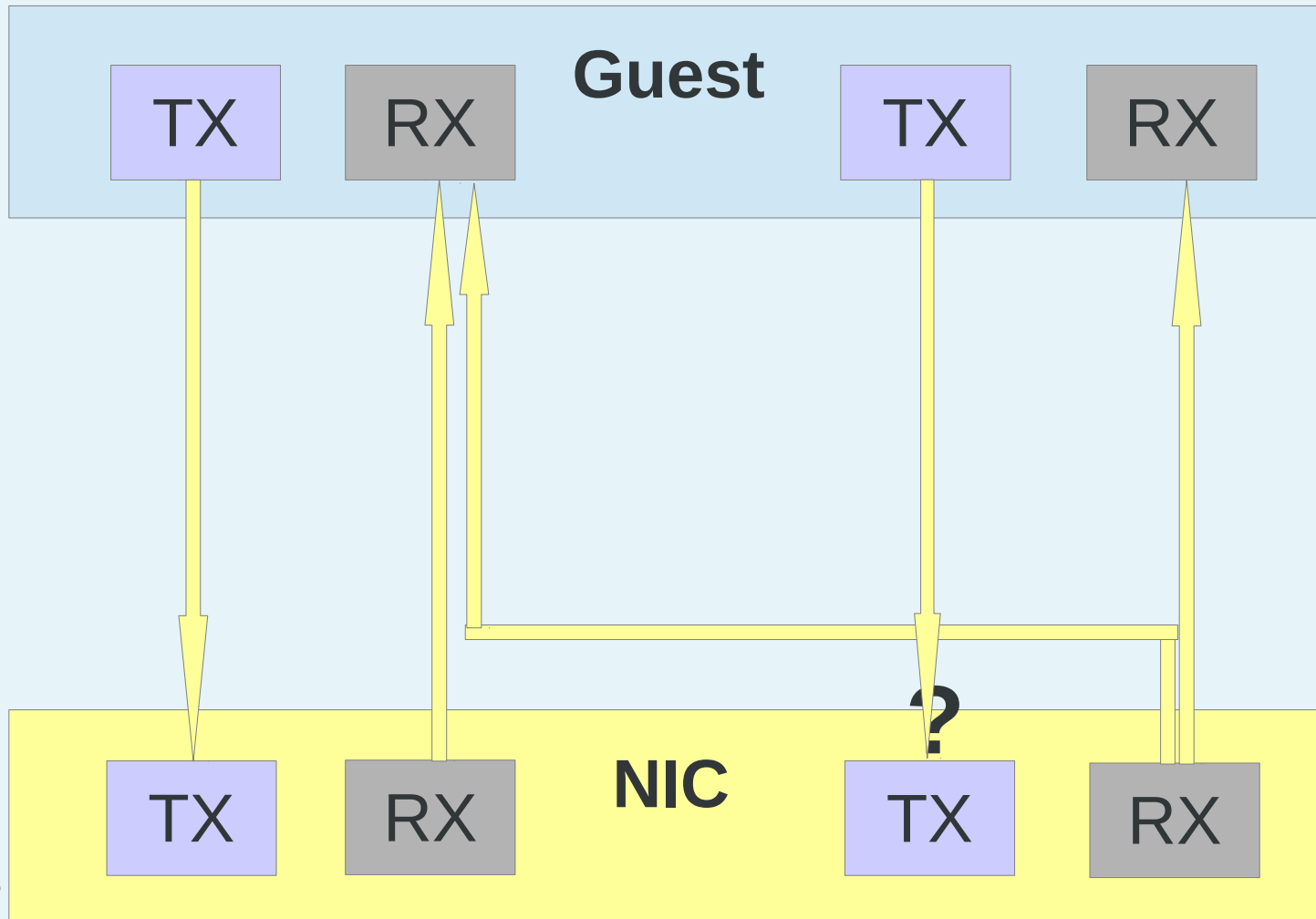


Guest -> External

CPU utilization



multiqueue



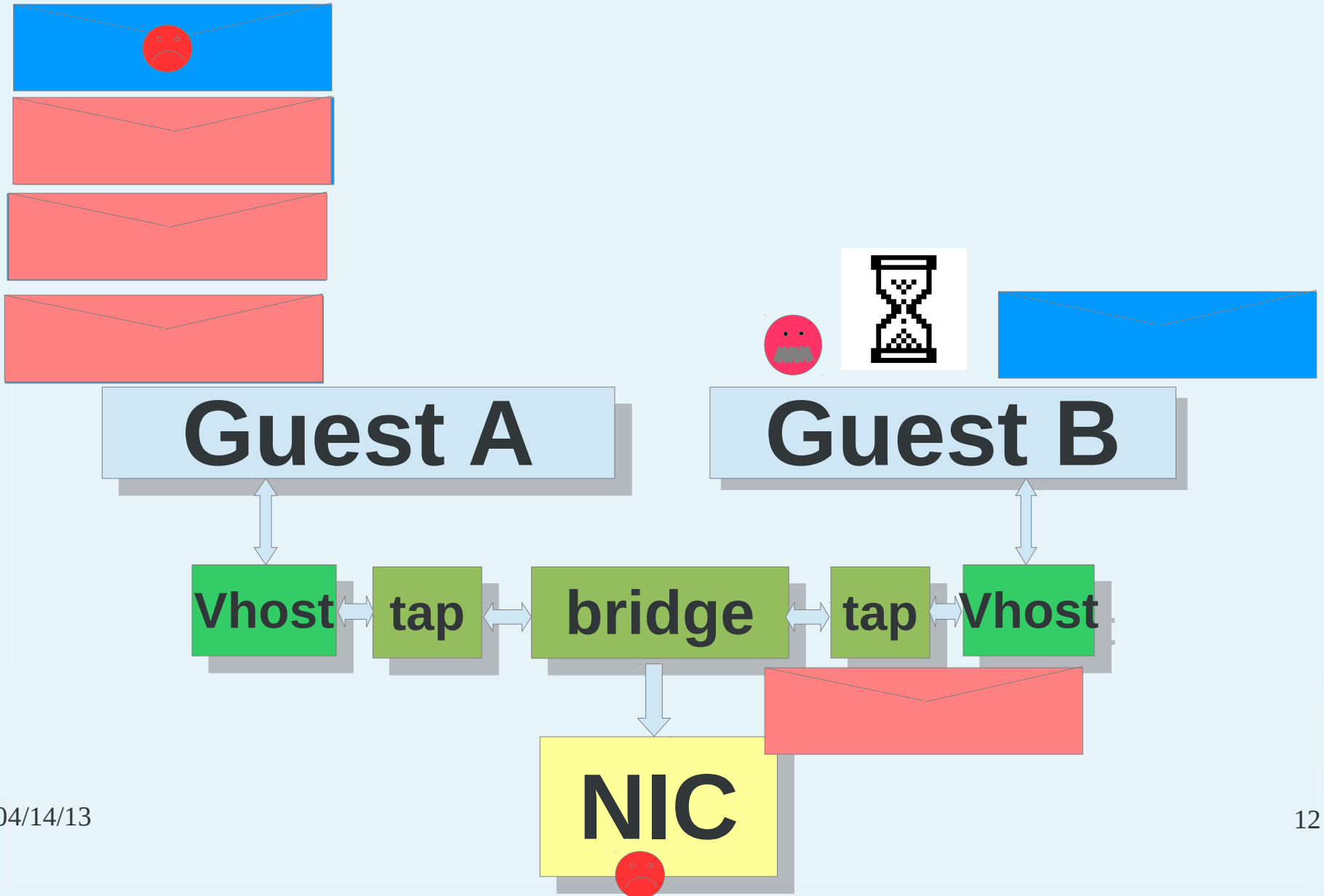
virtio

- **OASIS standartization**
- **New virtio devices**
- **Remoteproc-virtio firmware**

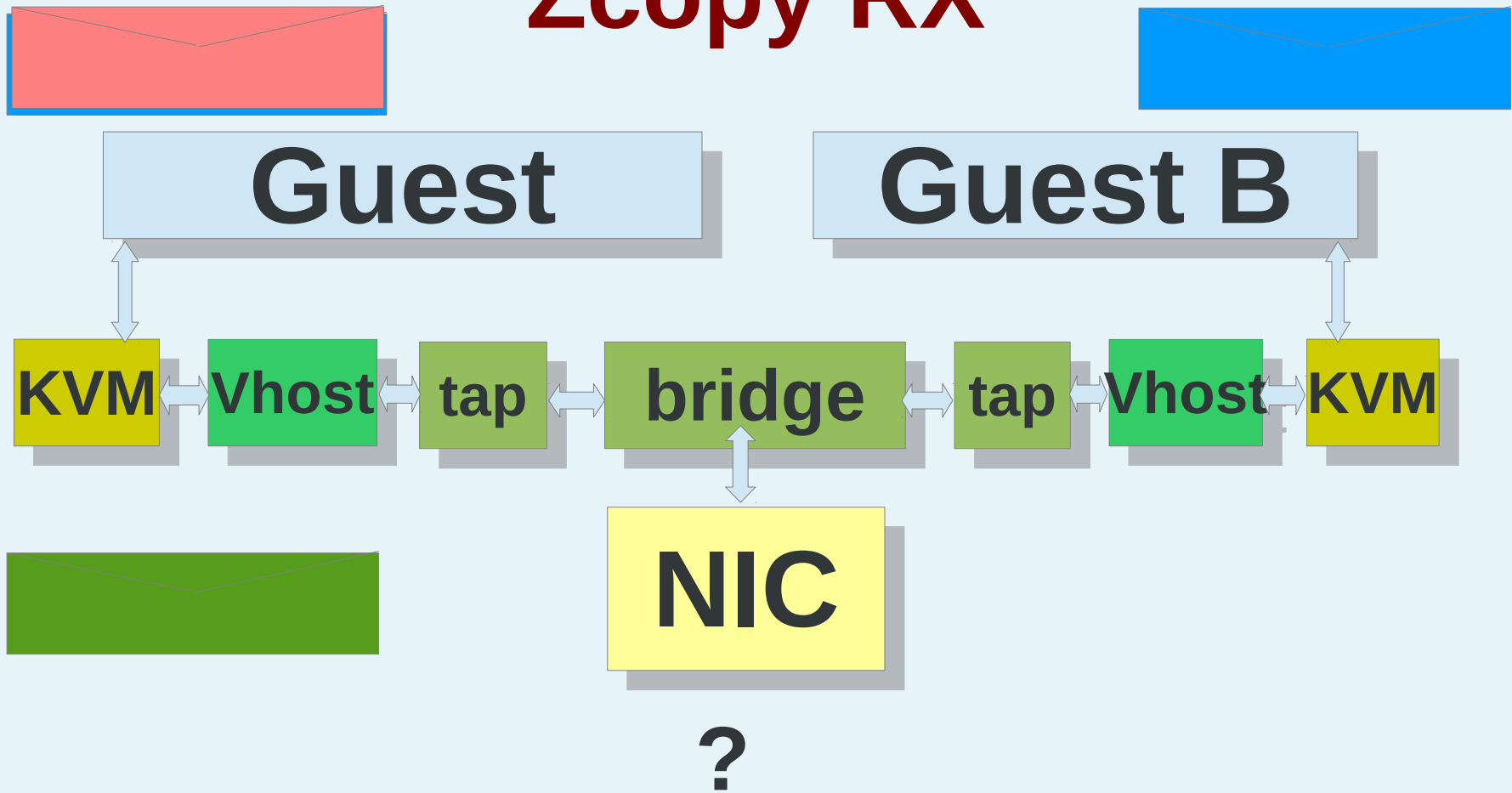
Vhost/virtio storage

Host	Guest
Tcm-vhost (vhost-scsi)	virtio-scsi
Vhost-blk	virtio-blk

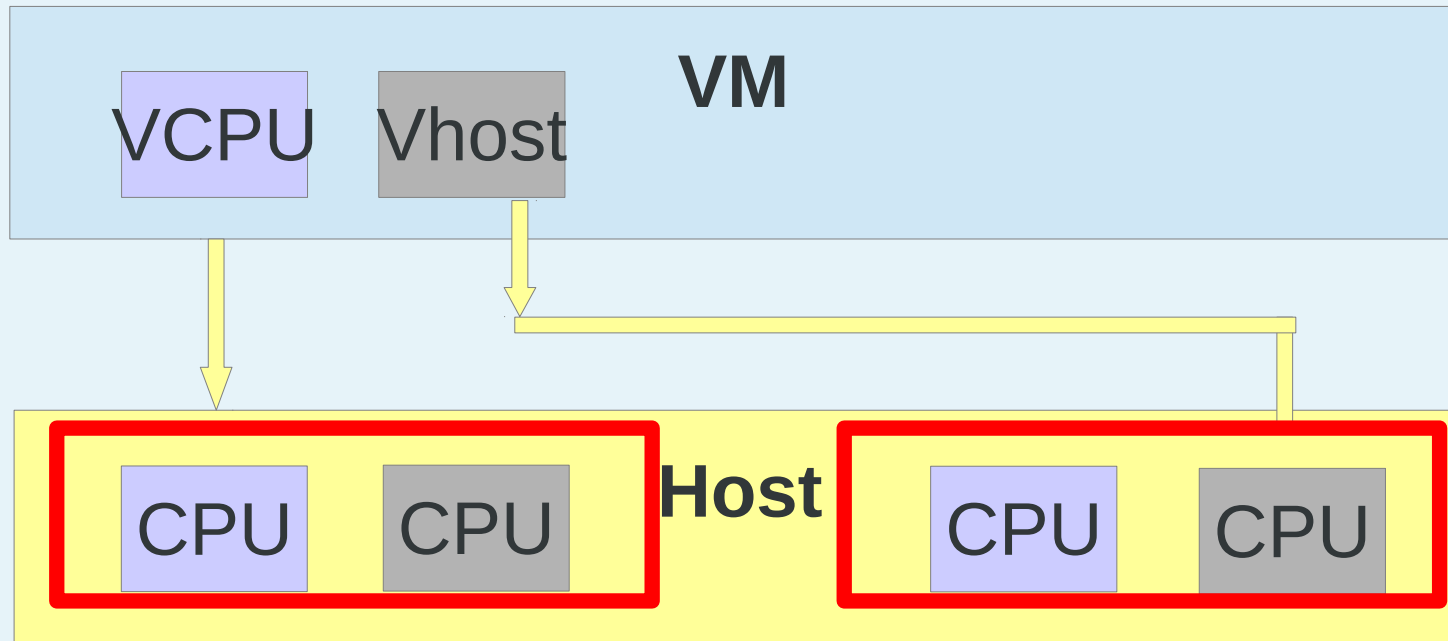
Guest 2 Guest



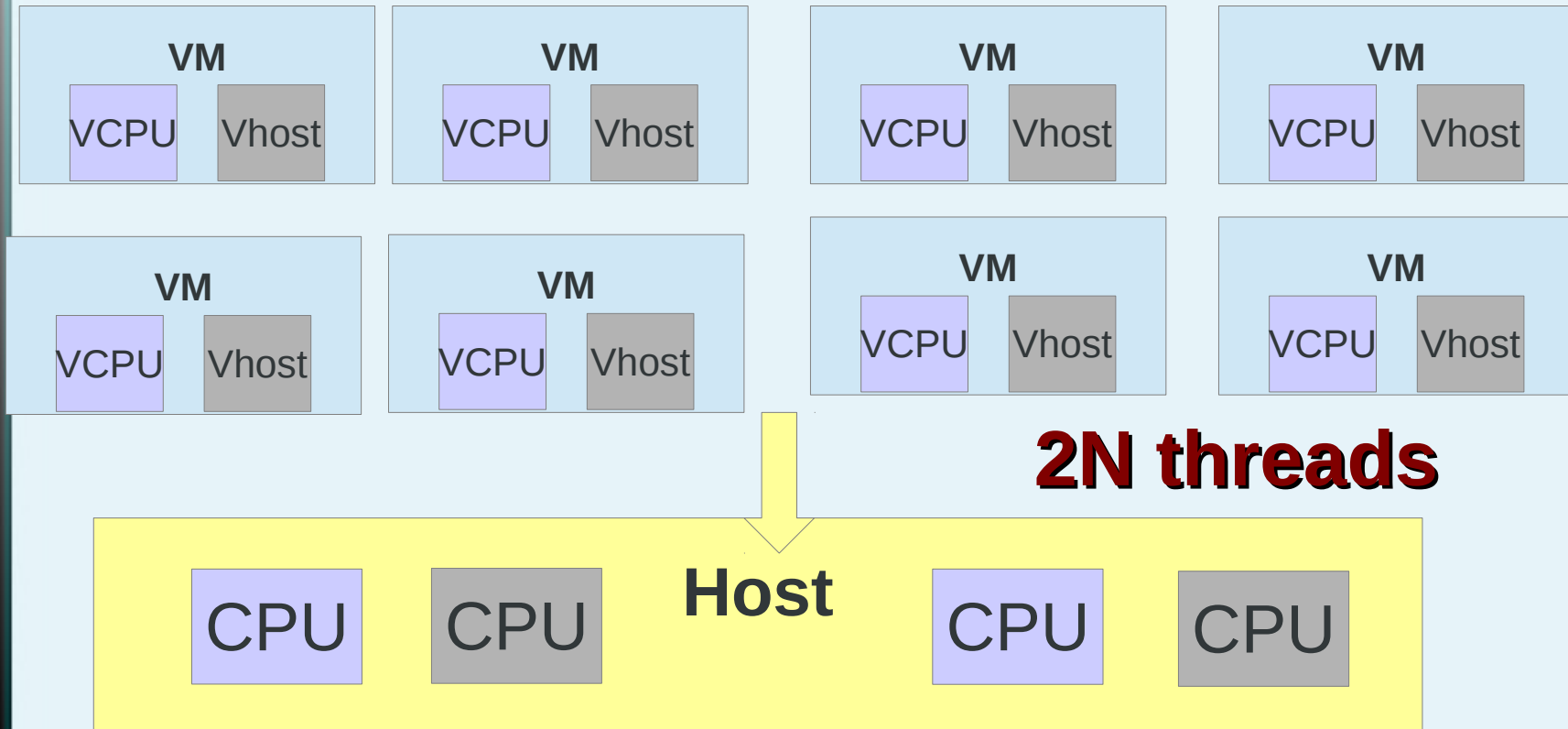
Zcopy RX



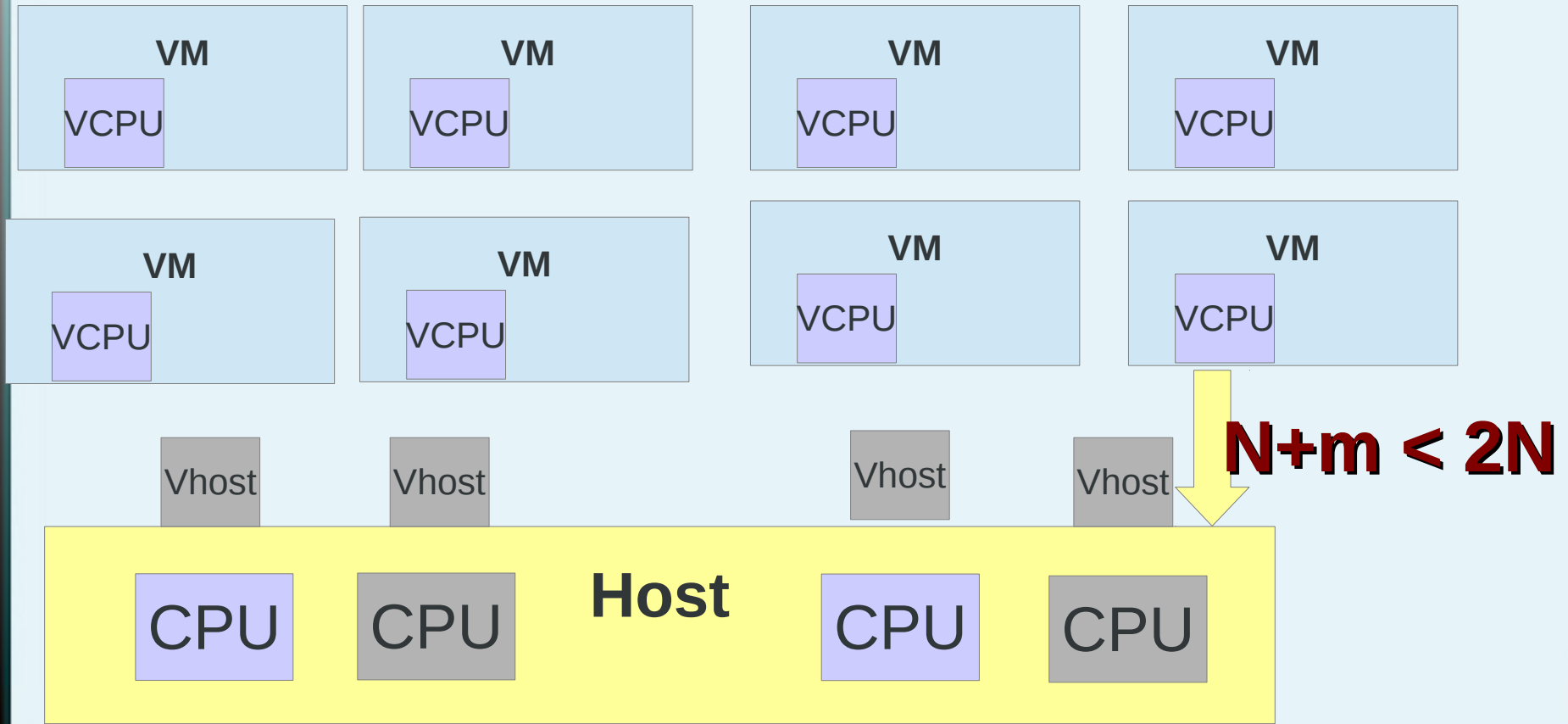
NUMA



Overcommit scalability



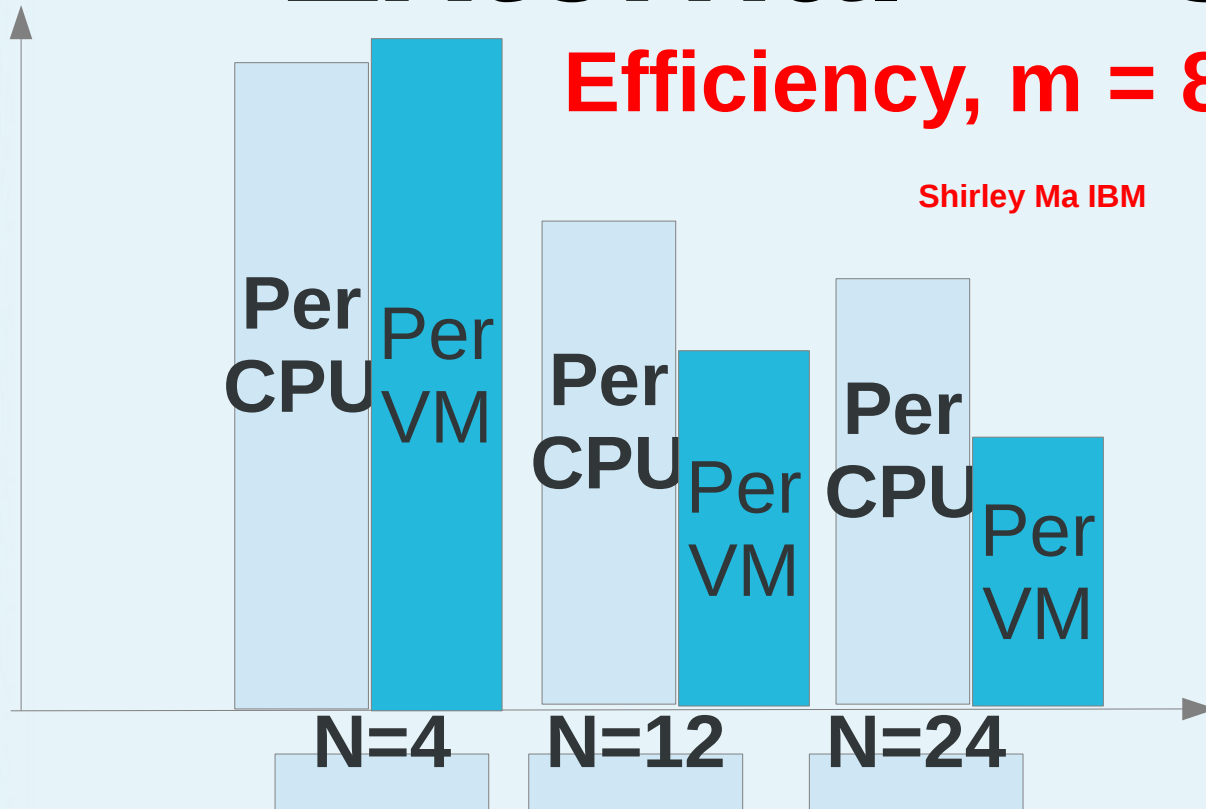
Overcommit scalability



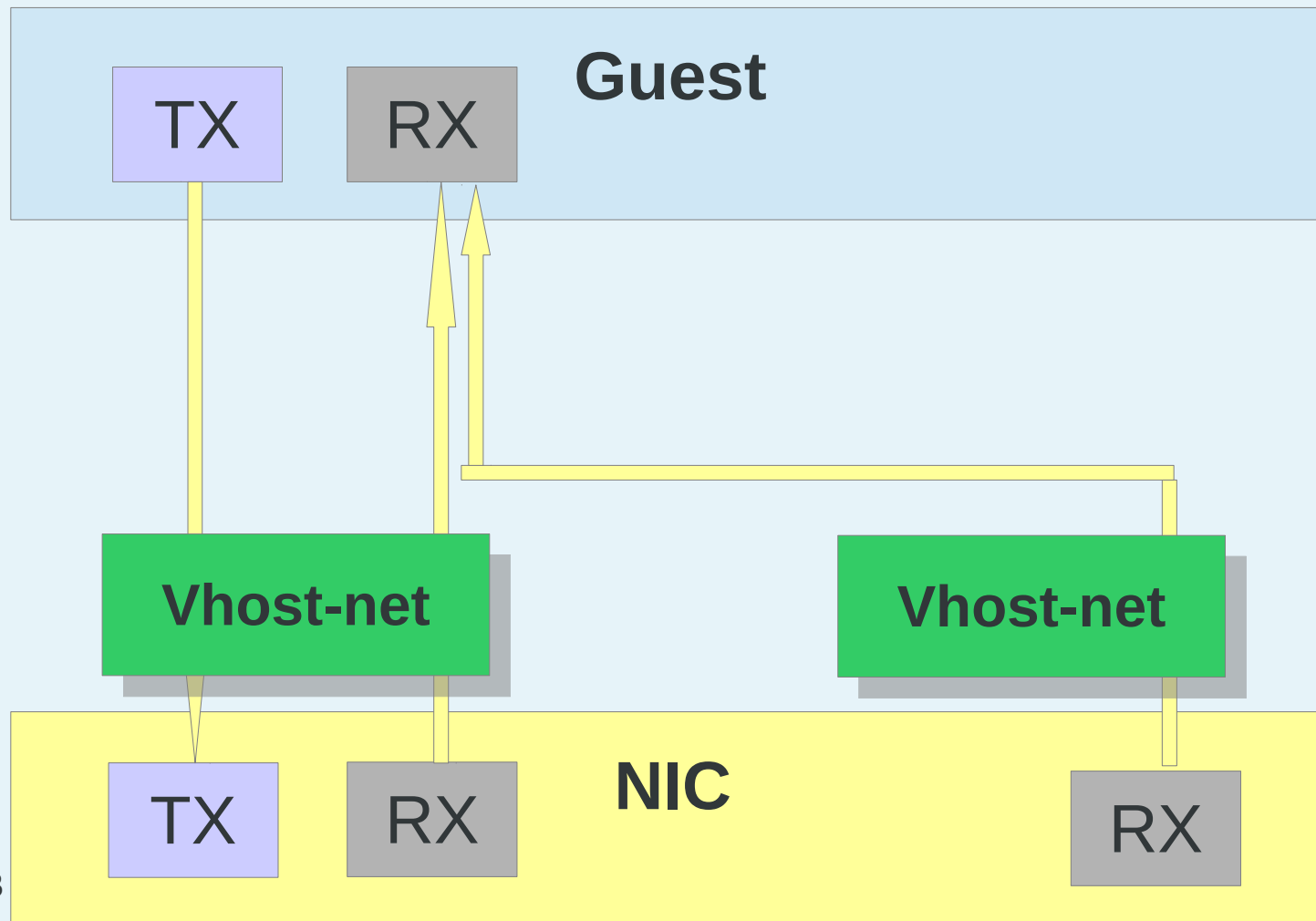
External -> Guest

Efficiency, $m = 8$ cores

Shirley Ma IBM



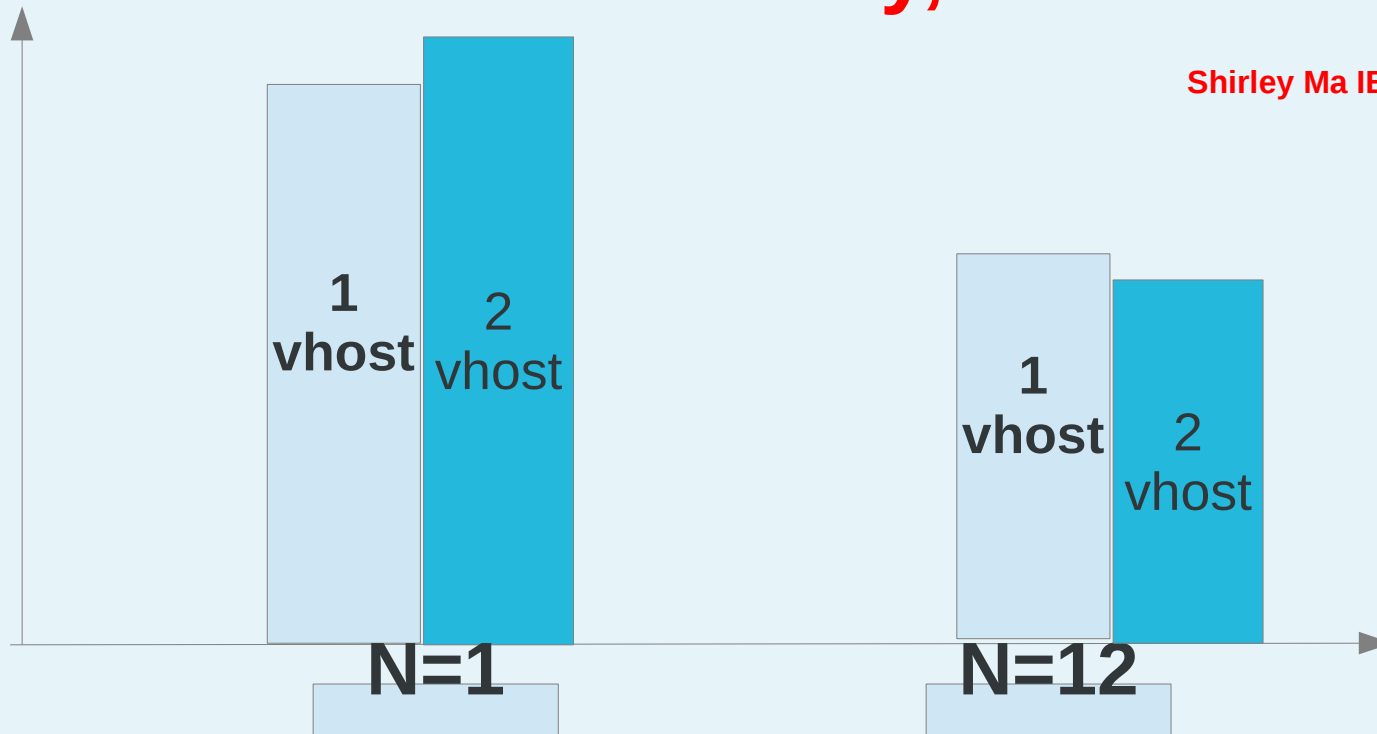
Idle host scalability



External -> Guest

Efficiency, $m = 8$ cores

Shirley Ma IBM



Status

- **Virtio specification** +
- **Vhost interfaces** +
- **Zero copy TX** +
- **Multiqueue** v

TODO

- **Guest2guest Zerocopy** ?
- **Zero copy RX** ?
- **scalability** ?
- **NUMA** ?

Thank you

- **Any questions?**