virtio- and vhost- net

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need for speed
Performance challenges
Vhost-net

Guest

KVM  Vhost-net  tap

qemu
ioeventfd

Guest

KVM → eventfd → Vhost-net

qemu
irqfd

Guest

KVM

eventfd

Vhost-net

qemu
irqfd

Guest

KVM  eventfd  Vhost-net

qemu
Mb/s

- Guest → Host
- Host → Guest
trans/s

User space

vhost
zcopy

Guest

KVM  Vhost  macvtap

NIC
zcoby

Guest

KVM

Vhost

backend

NIC
alignment

- Guest
- KVM
- Vhost
- backend
- NIC

hdr → data
multiqueue

Guest

Macvtap

NIC
Virtio ring

Avail

Desc

Used

Guest

Vhost
fragmentation

Desc

Vhost

4 packets
new ring

- Avail
- Desc
- Used

id

Vhost
Publish guest index

Diagram:
- Guest
- Used
- Vhost

Note: The diagram shows the relationship between Guest, Used, and Vhost.
Guest 2 Guest

KVM - Vhost - tap - bridge - tap - Vhost - KVM

Thread per host

Thread per guest
status

- ioevenfd/irqfd  V
- Vhost-net  V
- Virtio-net tuning  V
- Macvtap  V
- Mergeable buffers  V
TODO

- Zero copy +
- Multiqueue +
- Virtio ring +
- Threading ?
- Level interrupts ?