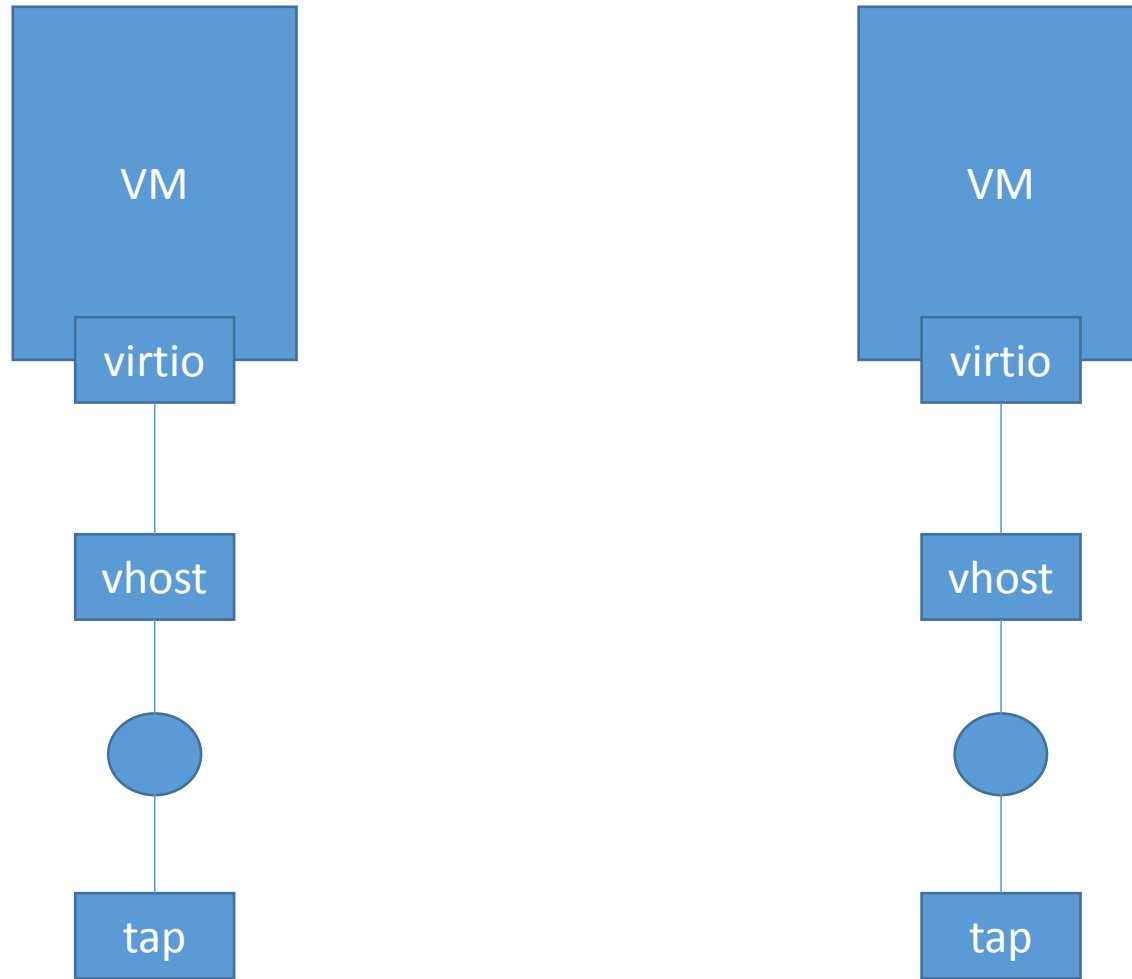


XDP for Virtual Machines

John Fastabend

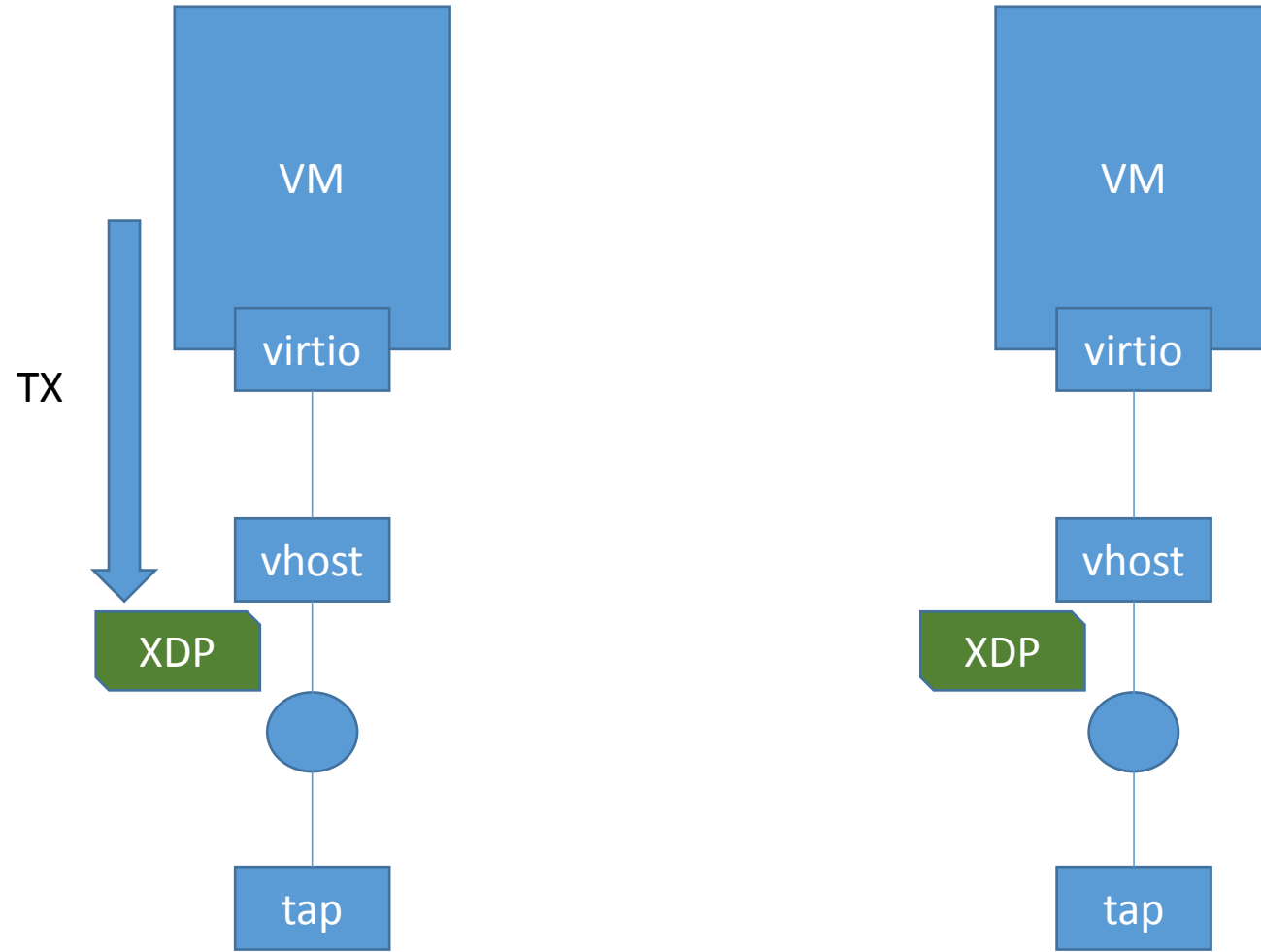
Intel



0. XDP Support for ixgbe, i40e

NIC (ixgbe, i40e)

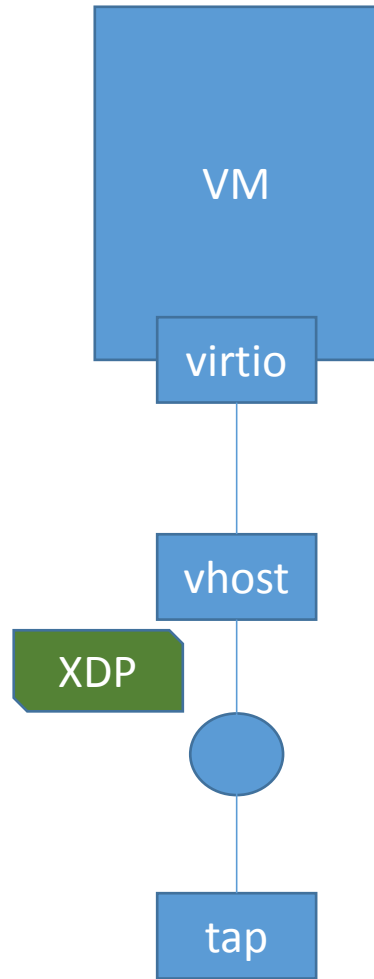
1. XDP Support for TAP



0. XDP Support for ixgbe, i40e

NIC (ixgbe, i40e)

1. XDP Support for TAP



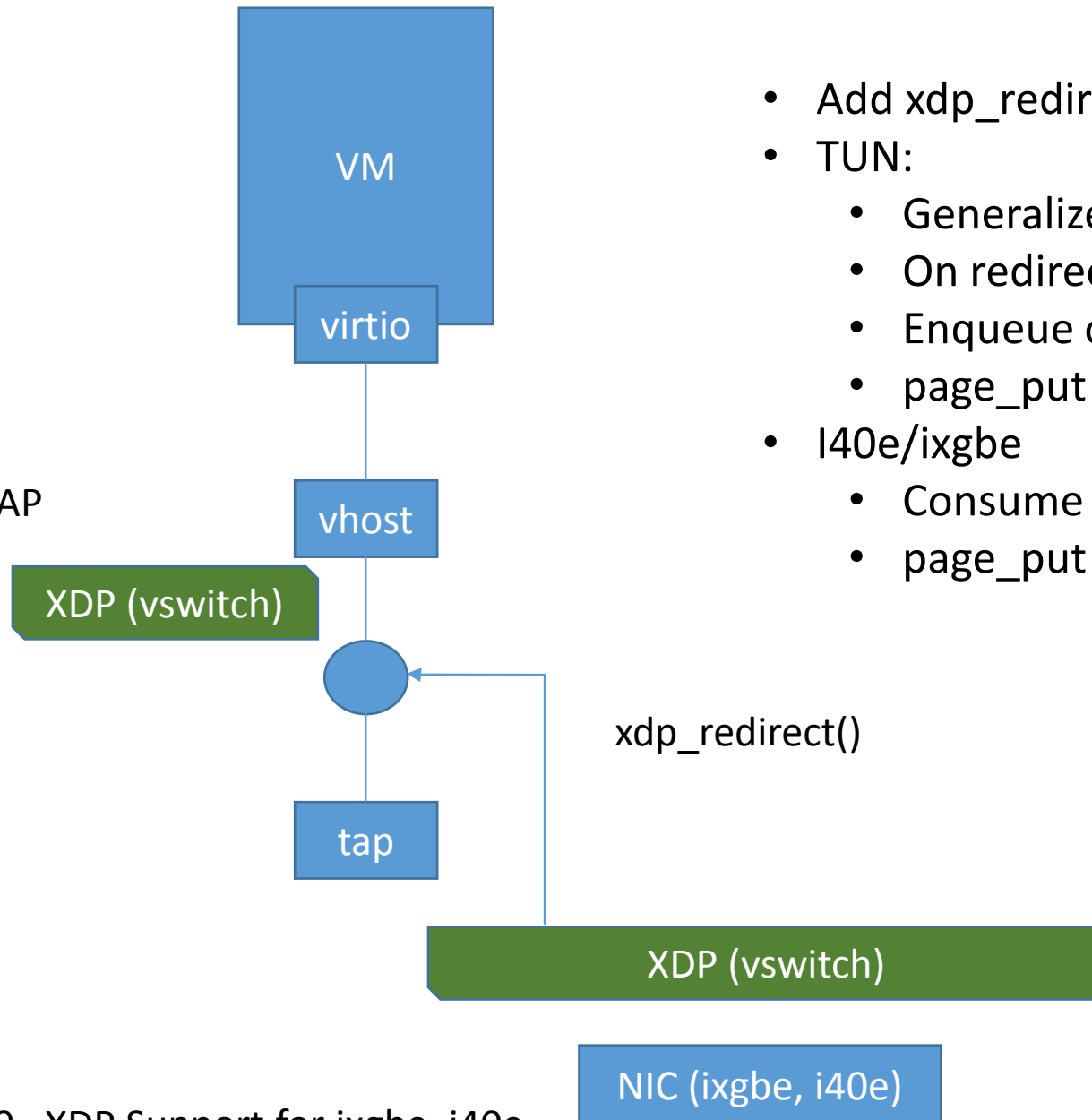
```
void (*ndo_xdo_xmit) (struct net_device *dev, struct xdp_buff *xdp)
-----
SEC("xdp_redirect")
int xdp_redirect(struct xdp_md *ctx)
{
    ...
    ifindex = bpf_map_lookup_elem(&tx_port, &key);
    if (!ifindex)
        return XDP_DROP; //bpf_redirect_mcast(
    return bpf_redirect(*ifindex, 0);
}
-----
virtio_net.c:

case XDP_REDIRECT:
    err = xdp_do_redirect(vi->dev, &xdp);
    if (err) ...
    return XDP_REDIRECT;
```

NIC (ixgbe, i40e)

0. XDP Support for ixgbe, i40e

1. XDP Support for TAP

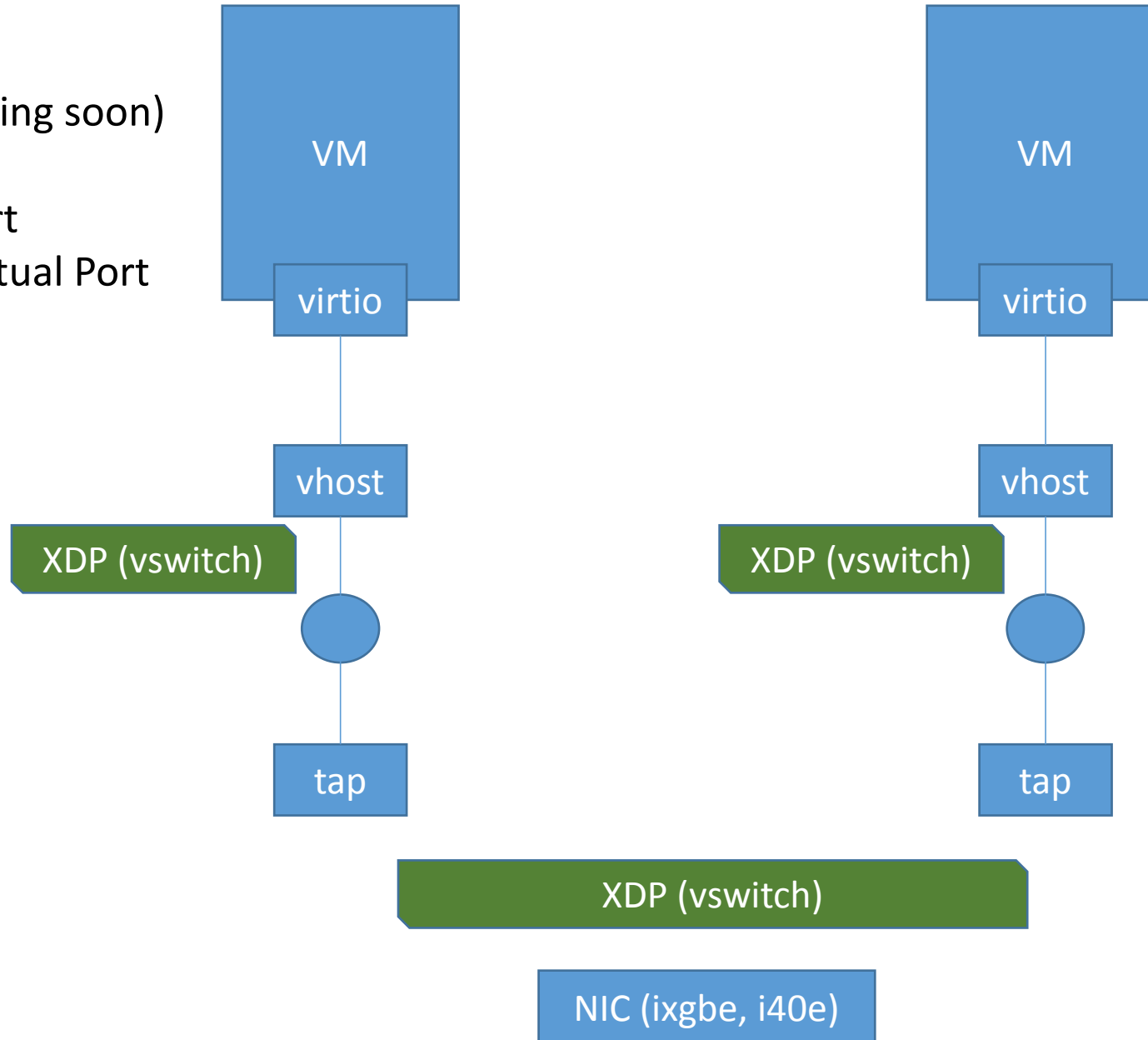


0. XDP Support for ixgbe, i40e

- Add xdp_redirect support to ixgbe, i40e and tun.c
- TUN:
 - Generalize ptr_ring to take virtio buffers
 - On redirect convert xdp to virtio
 - Enqueue on ptr_ring
 - page_put or destructor call after copy
- I40e/ixgbe
 - Consume xdp put buffer on TX descriptor
 - page_put or destructor call in irq clean

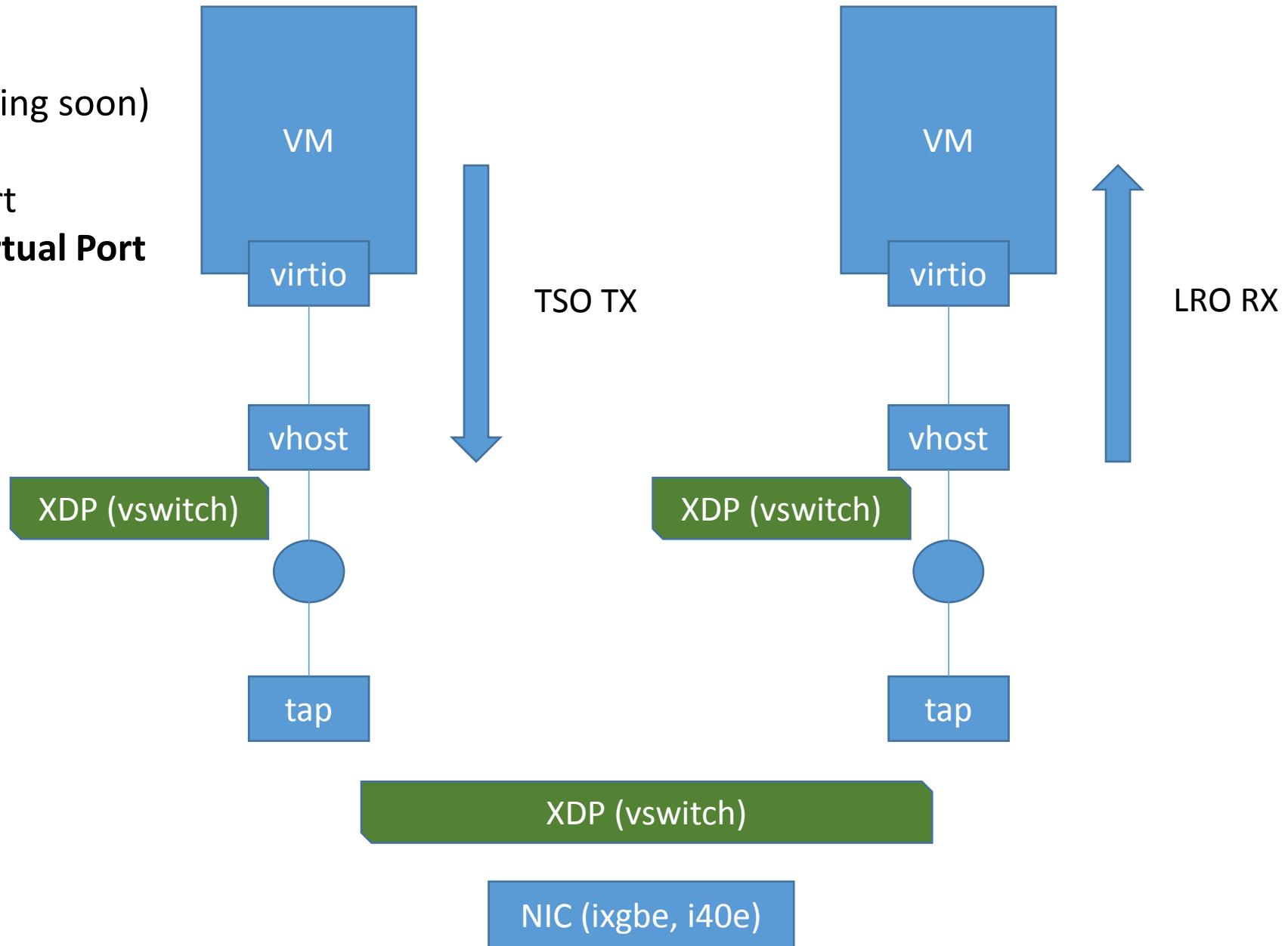
Benchmarks: (coming soon)

1. Port Virtual Port
2. Port Virtual Virtual Port
3. Virtual Virtual

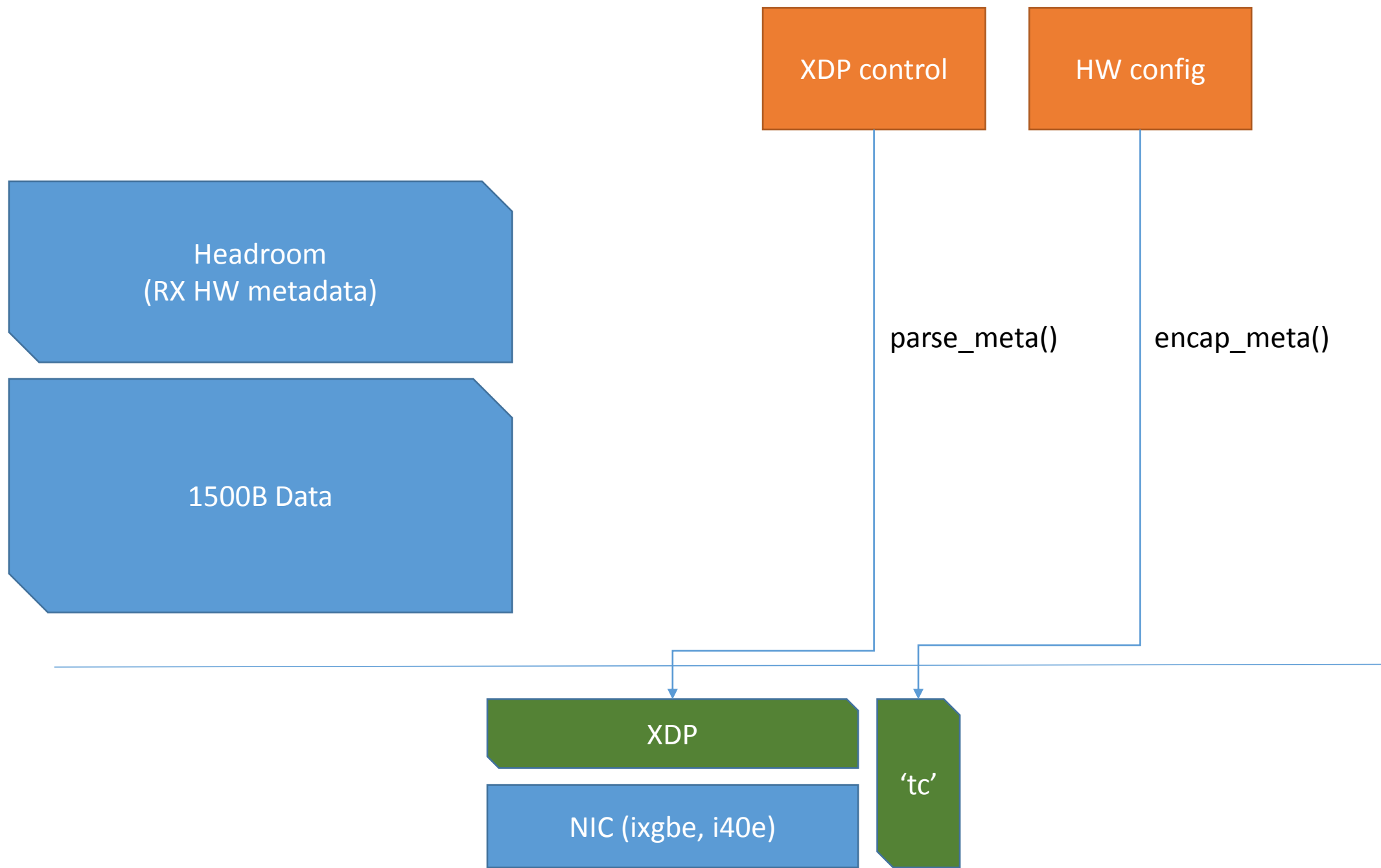


Benchmarks: (coming soon)

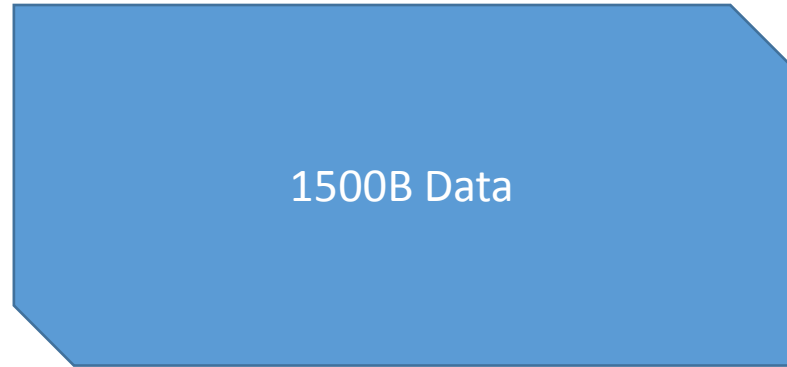
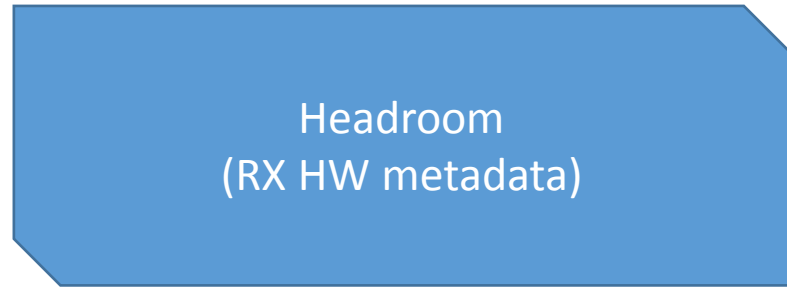
1. Port Virtual Port
2. **Port Virtual Virtual Port**
3. **Virtual Virtual**



XDP with Hardware Metadata Integration

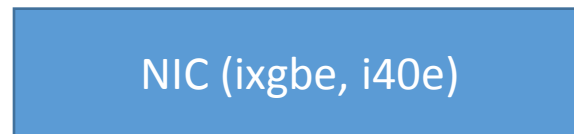


Headroom size? 192B



parse_meta()

encap_meta()



TX: what about checksum, TSO and other inline programming.

