13th ANNUAL WORKSHOP 2017

USE CASES FOR RAW ETHERNET QUEUE PAIRS

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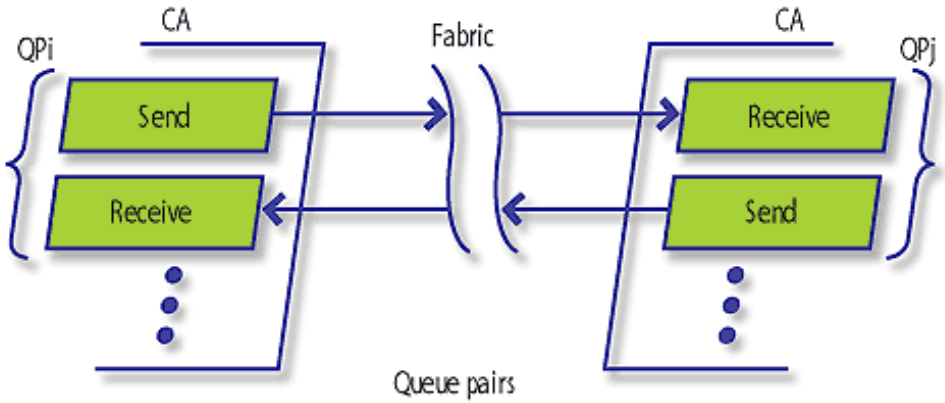
OVERVIEW RAW ETH QP USE CASES

Doing Amazing things with Ethernet Frames

- **What is a Raw Ethernet Queue Pair**
- **Packet Capture**
- **Direct User space packet**
- **Offloading Multicast streams to user space**

WHAT IS A RAW ETHERNET QUEUE PAIR

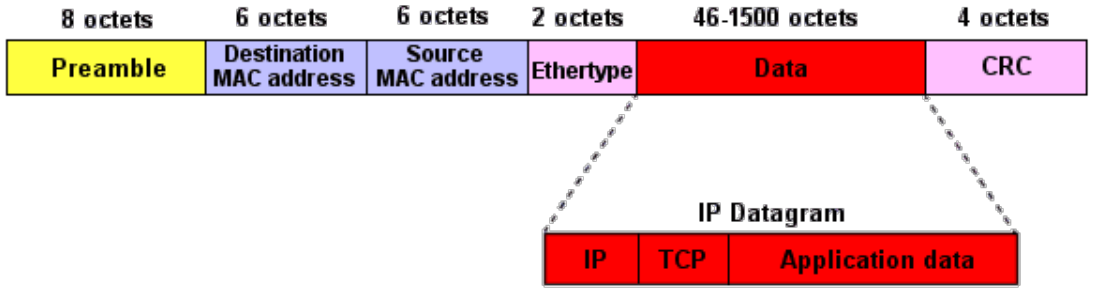
- **A queue pair like available for normal Infiniband traffic.**
  - UD only
- **Ability to send and receive Raw Ethernet Frames**
  - No IP stack. Just the raw hardware and the acceleration functionality provided by the Ethernet portion of the NIC.
  - No software overhead through kernel processing
- **Ethernet does not support connections in hardware like Infiniband**
  - Hardware support for connections missing
  - User space code must provide additional logic to compensate



RAW QPS FOR PACKET CAPTURE

RAW PACKET RECEIVE PROCESSING

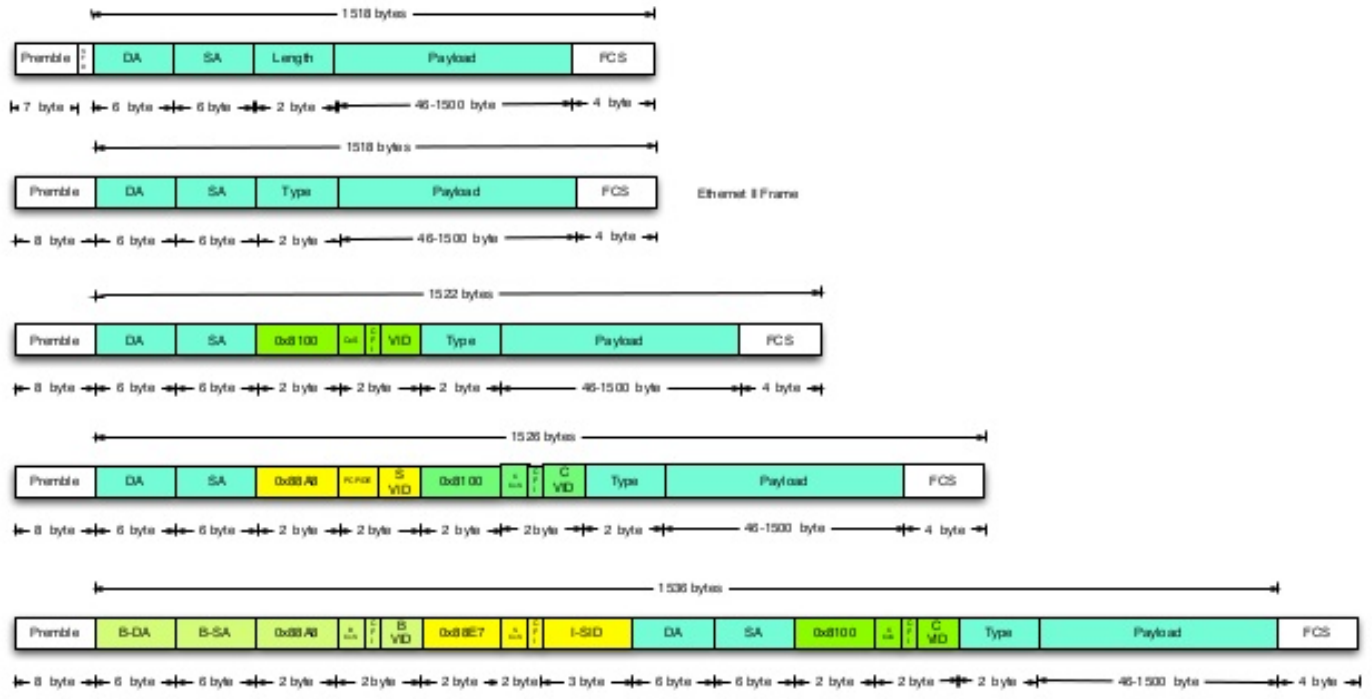
- Queue pair is opened for receice only.
- Interface in promiscuous mode
- Ability to audit all packets on a port
- Timestamping
- FCS checksum
- Low overhead reception in user space. Ability to capture at line rate for 10G and 1G.
- Ability to inspect packets that violate checksums and/or other requirements that are usually rejected by the network stack or hardware.
- Can be the basis for network diagnostic functionality.



SENDING RAW FRAMES

CUSTOM ETHERNET FRAMES

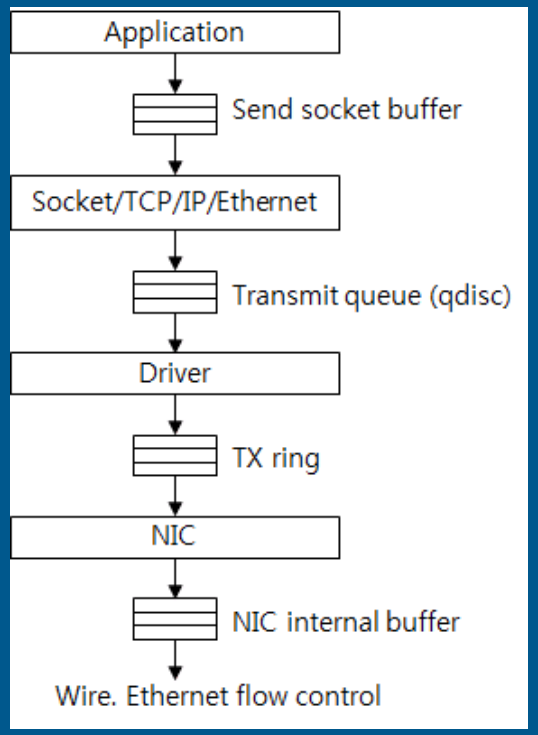
- **Ability to format a frame in user space**
- **Allows specialized frames with unusual fields set.**
- **Helps debugging network devices.**
- **Full control…**
- **Finally the OS is no longer in the way.**



MULTI CAST KERNEL BYPASS

COMBINED NETWORK IP STACK AS WELL AS MULTICAST BYPASS

The Wizard solution



- **Regular network stack of Linux does its job (and handles the traffic with its regular slowness)**
- **Select multicast groups are forwarded to user space bypassing kernel processing.**
- **Redirection of select multicast groups to queue pairs created by the RDMA application in user space.**

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THANK YOU

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