



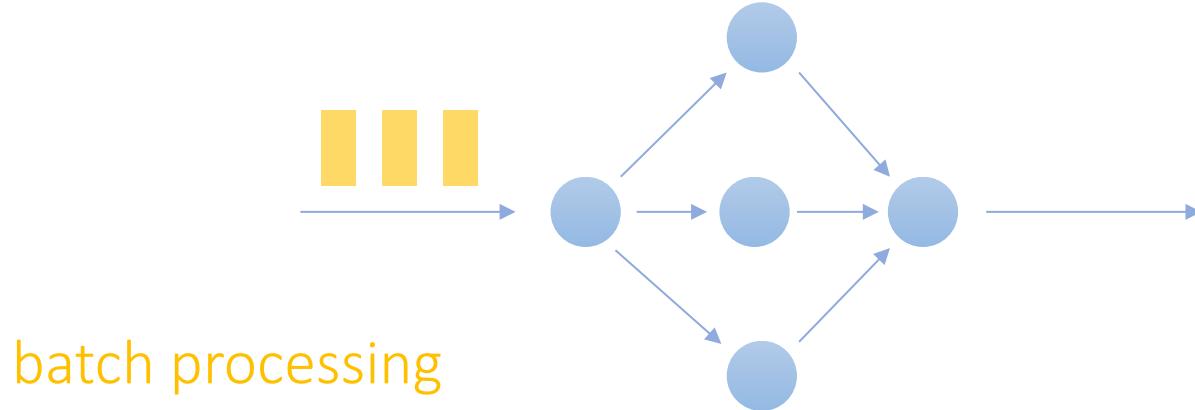
October 15, 2020
Virtual Experience

Using VPP as Envoy's Network Stack

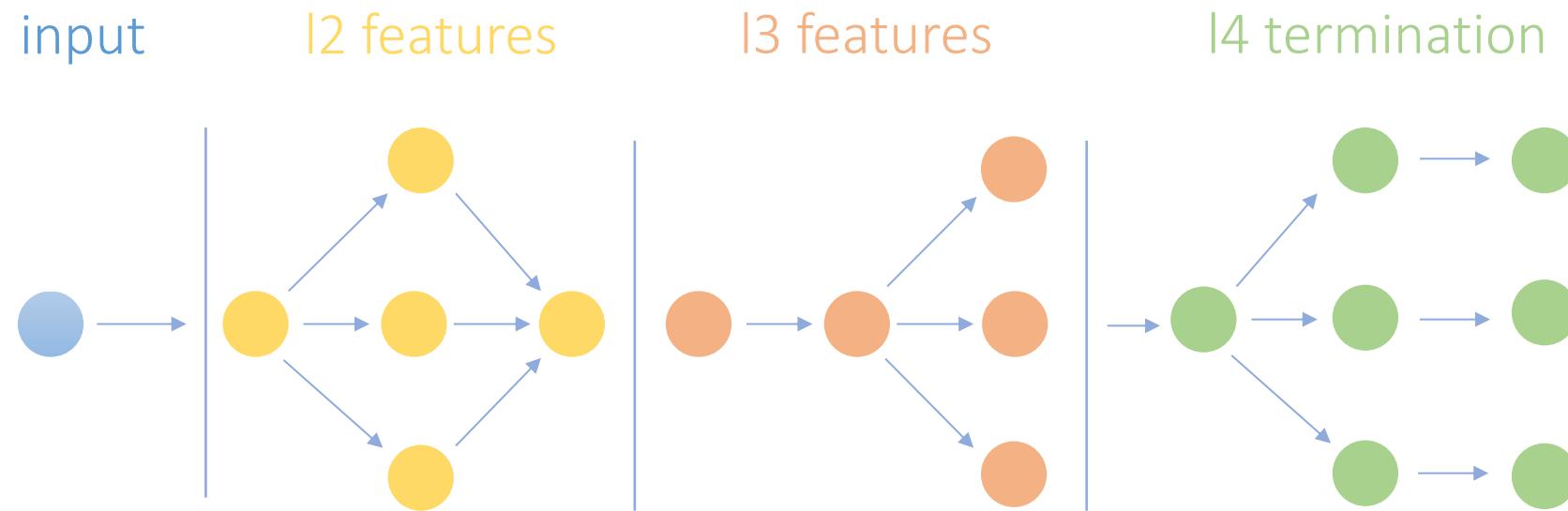
Florin Coras, Cisco

Vector Packet Processing (VPP)

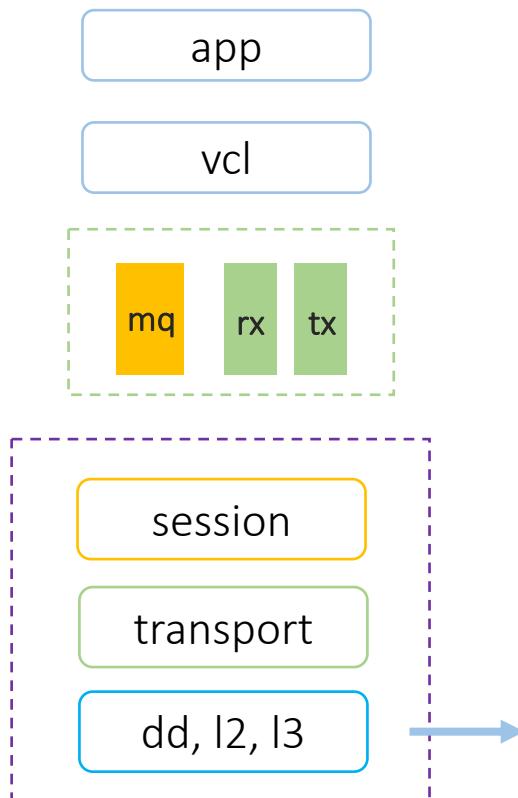
forwarding model as a graph



Vector Packet Processing (VPP)

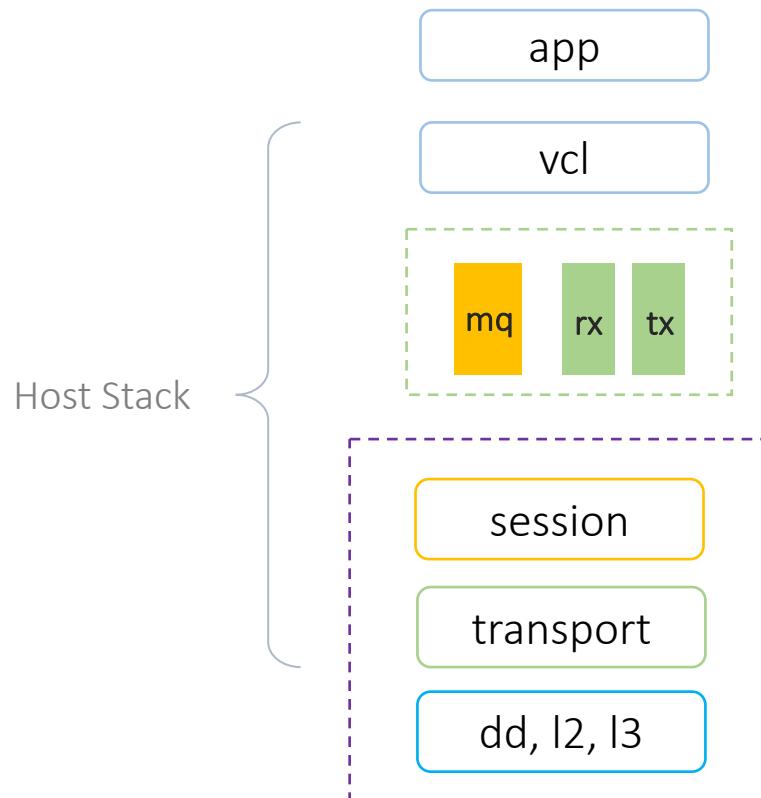


Network Stack



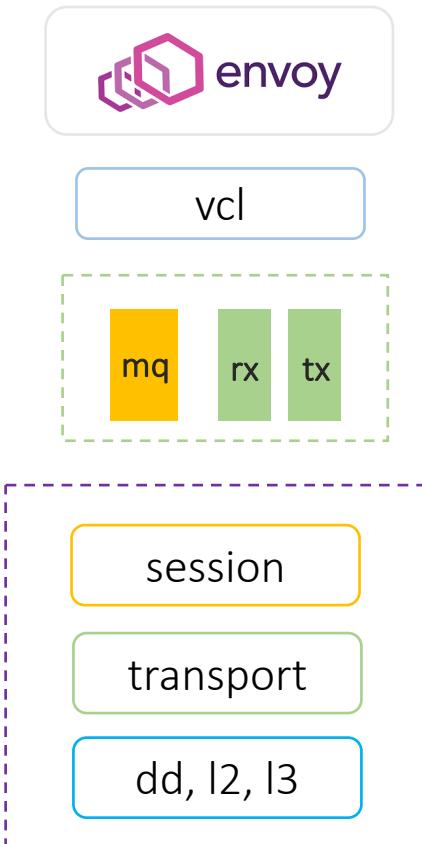
- DPDK and native device drivers
- Switching, Routing
- IPsec, ACL, NAT, MPLS, SR, tunneling ...

Host Stack



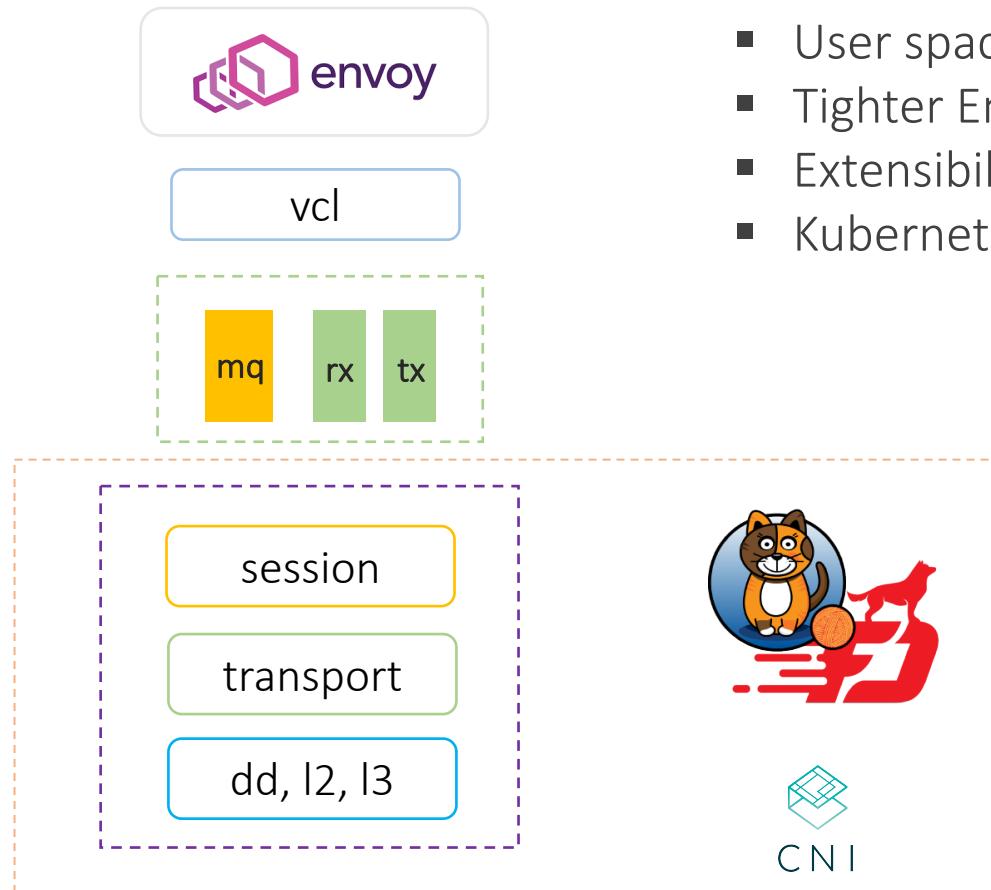
- Transports: TCP, UDP, QUIC, TLS
- Session scheduling, on demand tx pacing, builtin app support
- Shared memory infra for io/ctrl events and data exchanges with external apps
- POSIX-like apis through VCL

Why?



- User space performance
- Tighter Envoy integration with network stack
- Extensibility

Why?

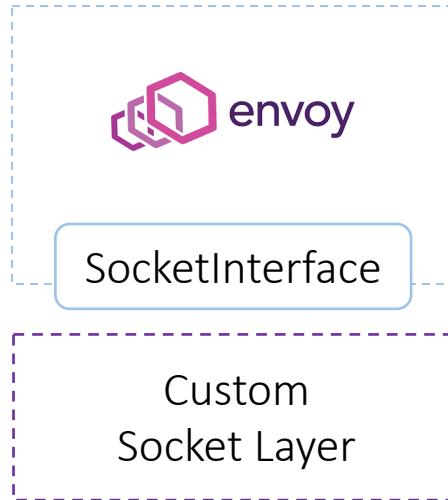


- User space performance
- Tighter Envoy integration with network stack
- Extensibility
- Kubernetes integration via Calico-VPP ([see talk](#))

Envoy VCL Interface

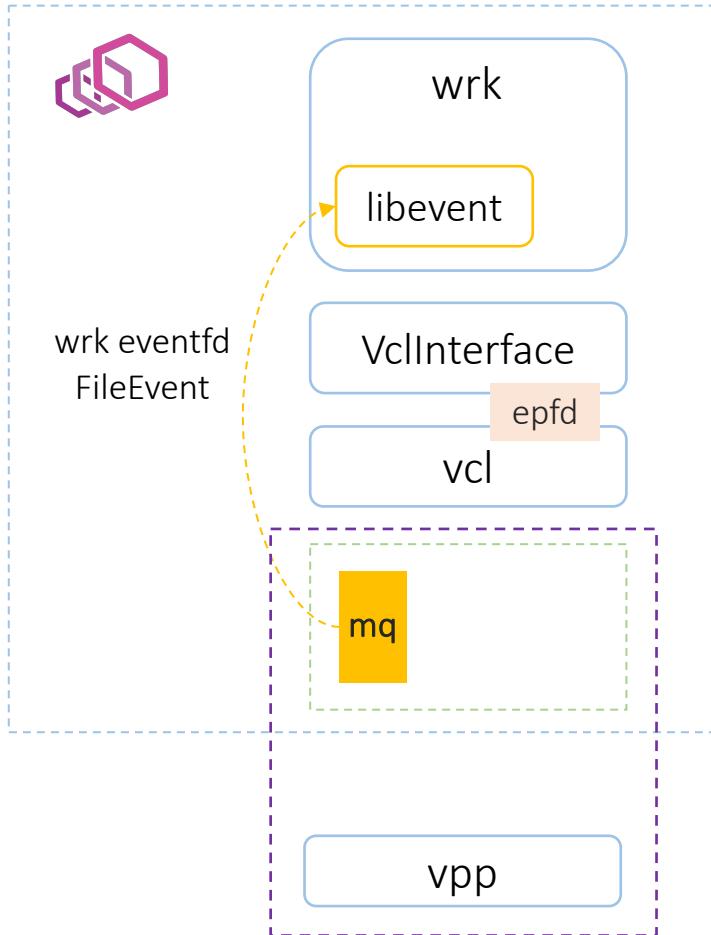


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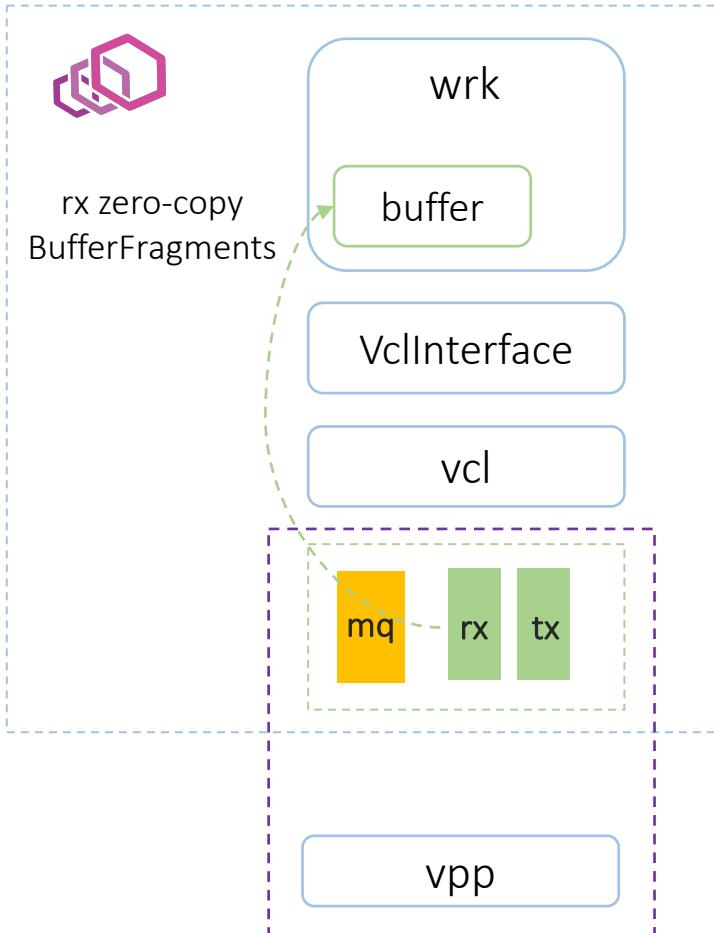
- Prerequisite: Socket and IoHandle refactor
 - Avoid direct use of socket fds
 - Pluggable IoHandle factories (SocketInterfaces)
 - Delegate FileEvent creation to IoHandle
 - Custom BIOs for TLS

Envoy VCL Interface



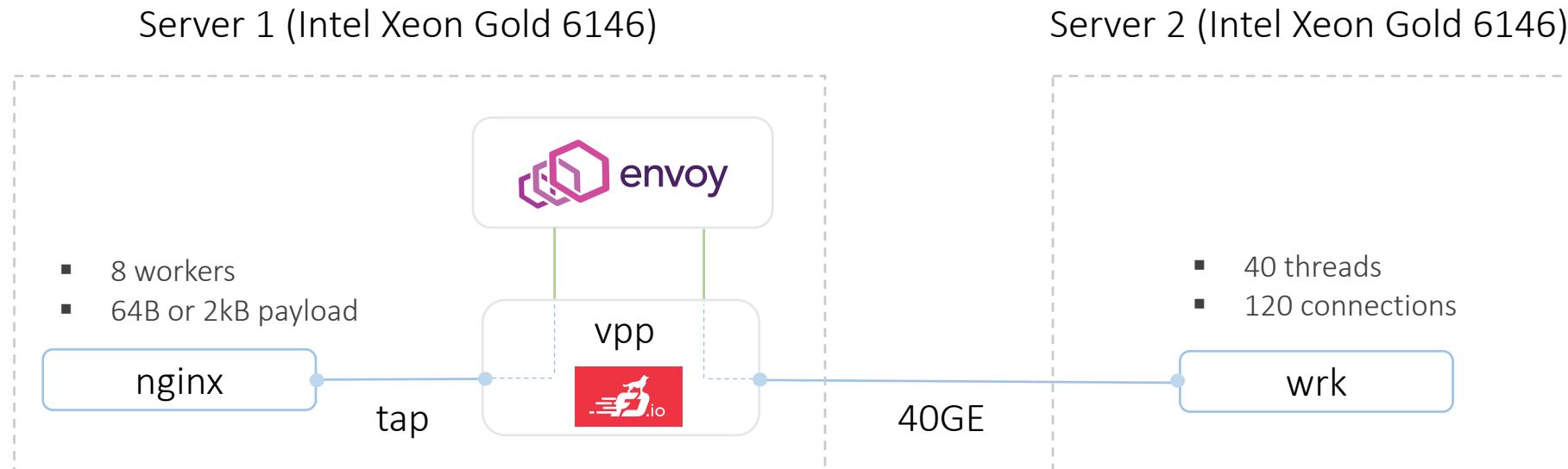
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 - Retrieves async VPP session events via VCL worker eventfd FileEvent
 - Maintains per worker epoll fd that tracks all IoHandles
 - Custom VCL IoHandle FileEvents are created and dispatched independent of libevent

Envoy VCL Interface

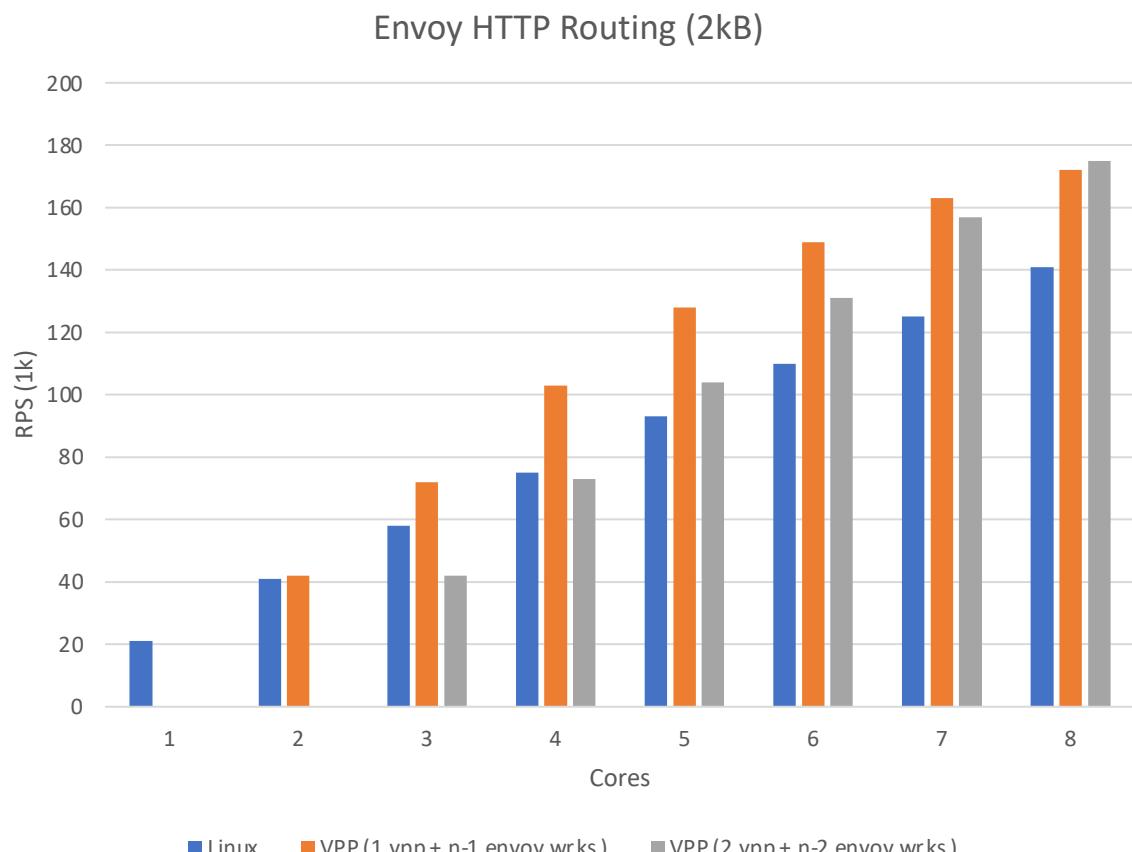
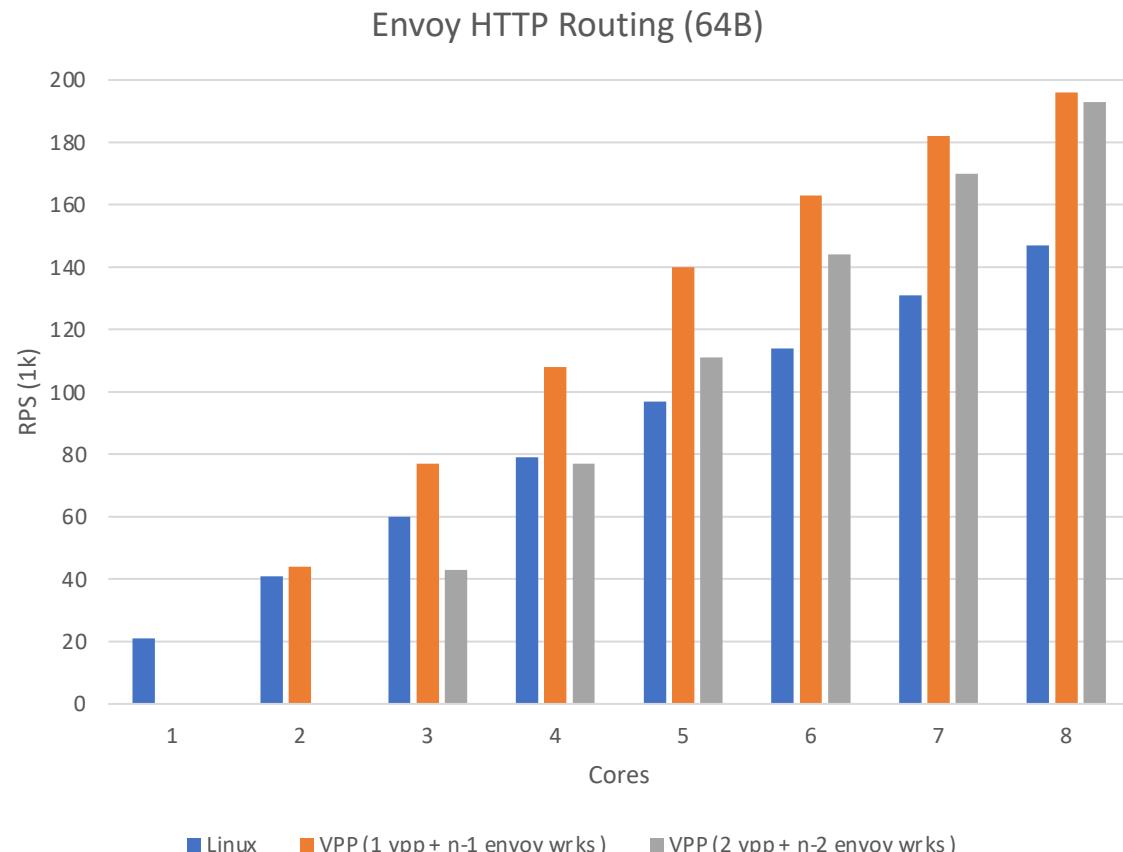


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- Next steps VCL IoHandle Optimizations
 - Optimize socket read operations
 - Investigate minimizing data copying

Performance



Performance



Thank You



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- Early Envoy-VPP integration code
 - Github: <https://github.com/florincoras/envoy-vpp>
 - Slack: <https://envoyproxy.slack.com/>
- VPP Project:
 - Parent LFN project: <https://fd.io/>
 - Mailing lists: <https://lists.fd.io/g/main>
 - Host Stack documentation: <https://wiki.fd.io/view/VPP/HostStack>