NFShunt: OpenFlow Firewall Acceleration

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Firewalls

- Achieve high throughput with parallelisation.
- Support thousands of separate flows
- Not as good at supporting a lot of throughput for a single flow
- Not so good for big data

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Boring Solutions

Buy a bigger Firewall

- Somewhere in the order of $100k for 10Gbps firewall

ACLs

- Are they secure enough?
- Use a lot of flow table entries for an OpenFlow solution

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NFShunt!

- Made by Simeon Miteff at SANReN
- Hybrid Stateless-Stateful firewall
- Exploit long tail in network flow size
- Redirect to netfilter (or some other firewall) by default
- Large authorised flows redirected to bypass the firewall entirely

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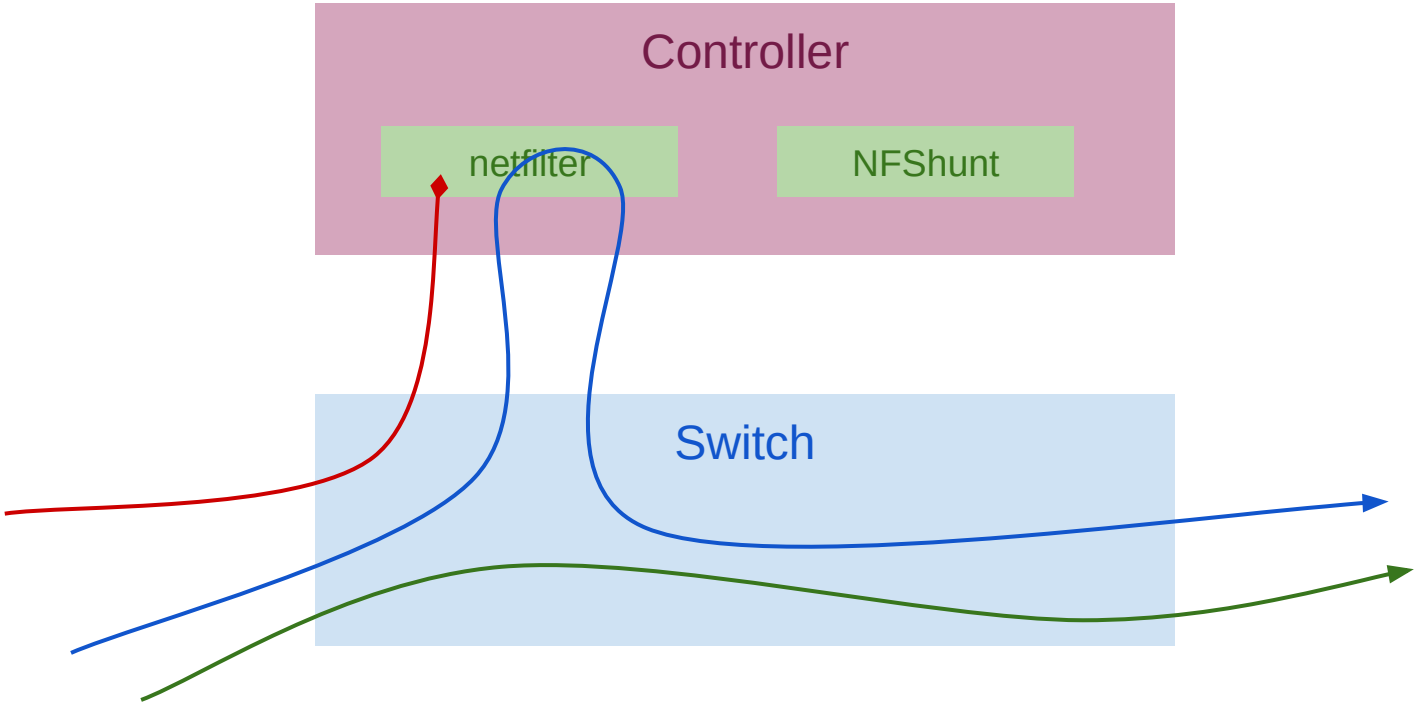

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Pros:

- Better security than ACLs
- Fewer OpenFlow rules than ACLs
- Line rate throughput for large flows
- SSH, HTTPS - no point in looking at more than the first couple of packets anyway
- Default drop actions can mitigate attacks against the firewall itself

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Cons:

- Less secure than a firewall
- Can’t match on TCP flags
- Can’t match on layer 7

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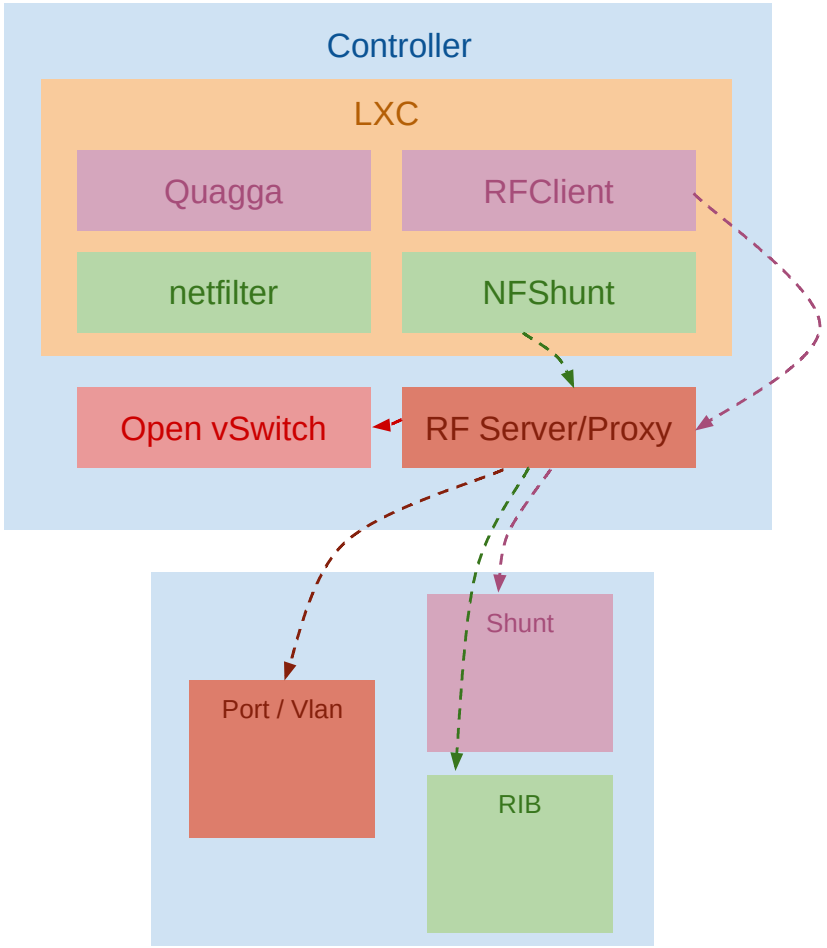
Plugging NFShunt into Vandervecken



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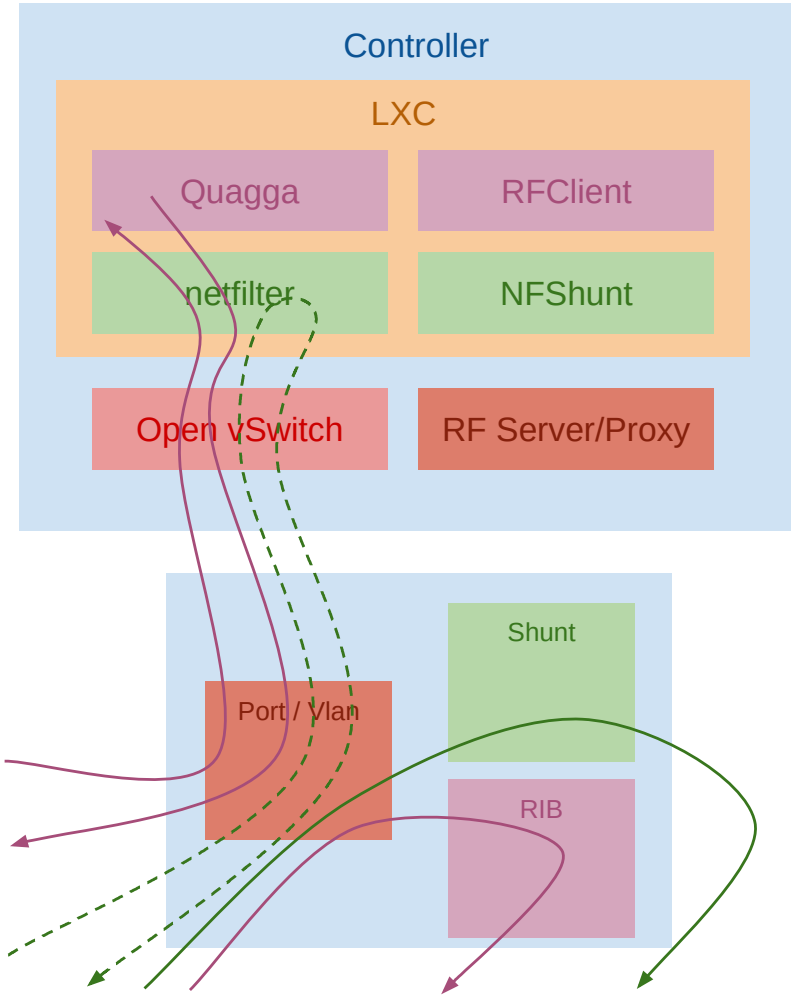

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Redirection vs Encapsulation

- Encapsulation is Ethernet over OpenFlow over TCP
- NFShunt uses redirection, RouteFlow uses encapsulation
- Encapsulation allows sending partial packets
- Encapsulation gives extra information:
  - Reason / Cookie / Table id
  - Match: In Port / Metadata

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RouteFlow redirection

- Need in port information on packets from datapath
- Need to know where to output packets from controller
- Use Vlan tags (or MPLS labels)

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