DPDK Based Virtual Network Packet Broker

Case Study

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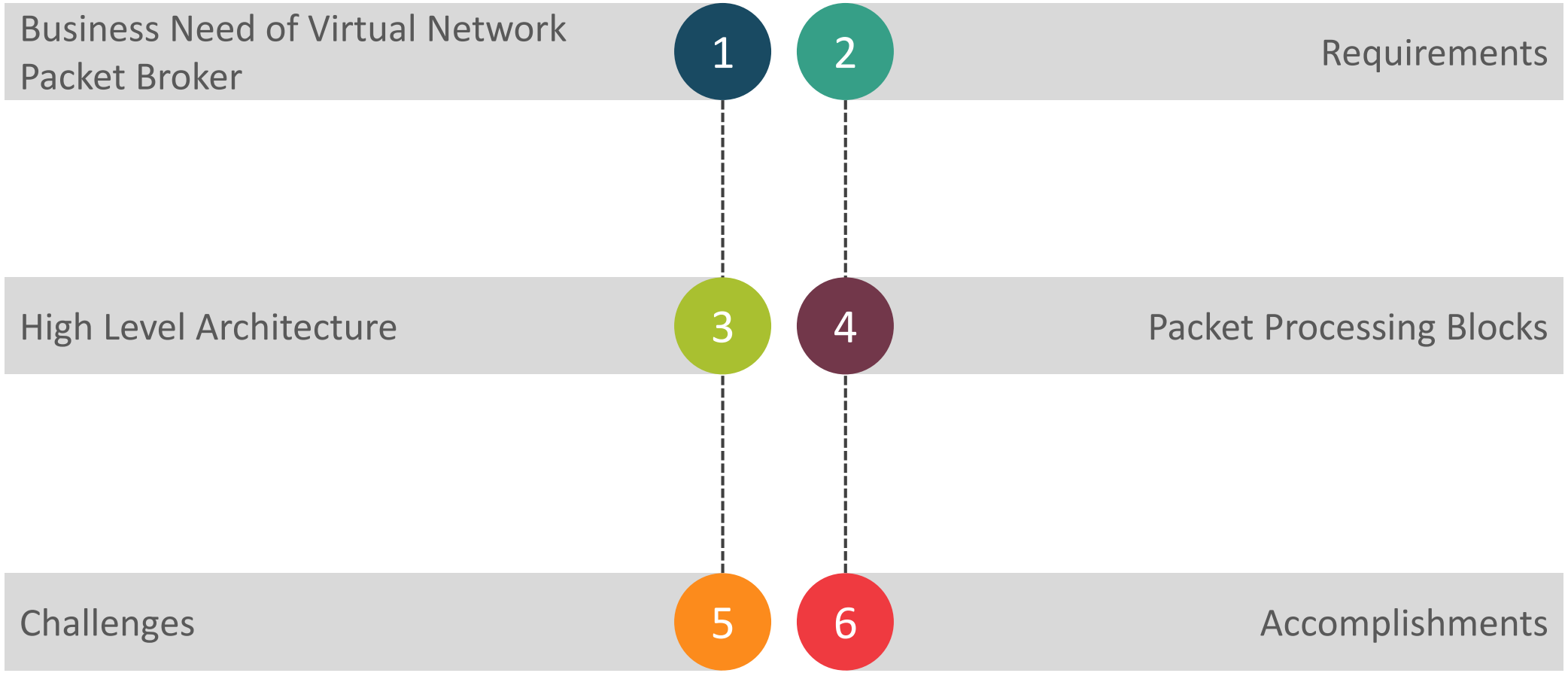
Agenda



Business Need

The Networks need better analysis and visibility for best customer experience and ROI – which a physical NPB is capable to meet.

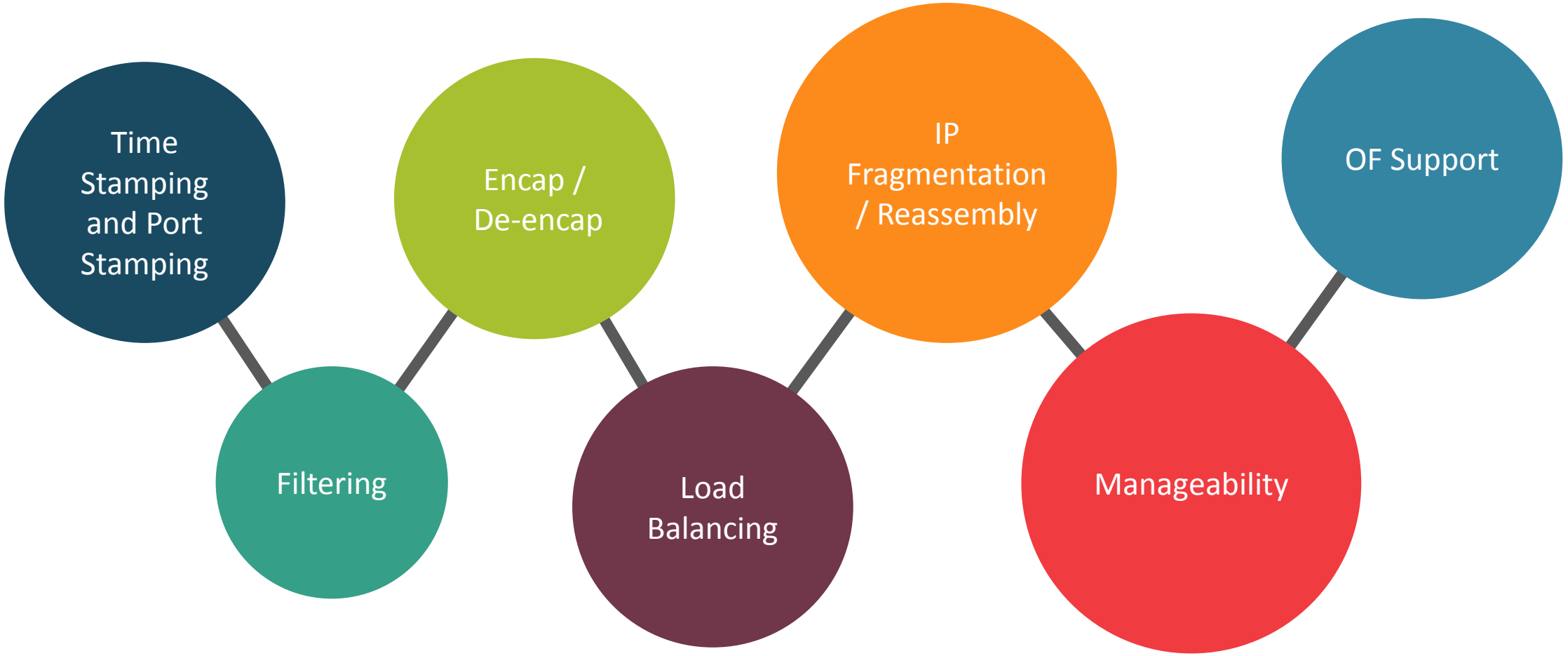
- Quality Of Service performance
- Tools and application performance
- Security

Physical NPB however may not be adequate or would be inefficient for these emerging needs of Networks that are becoming more and more software oriented (vEPC, CORD,..)

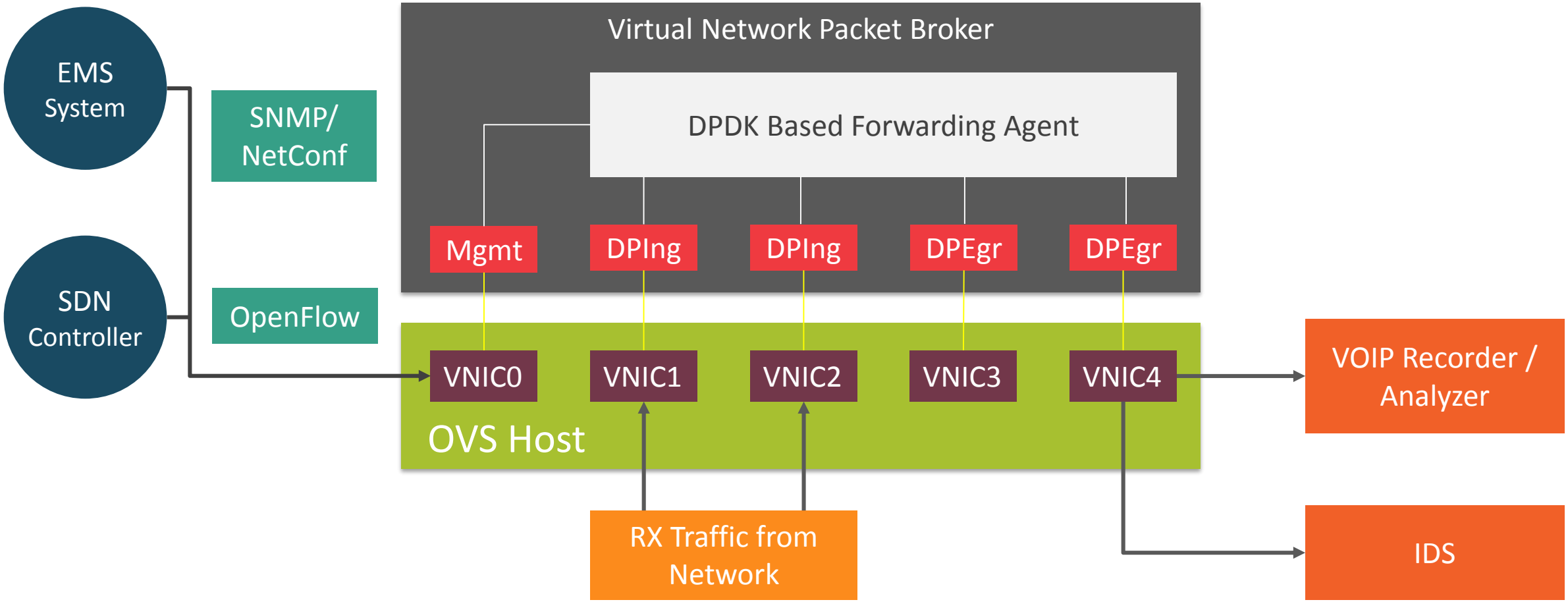
- Reactive to the programming / re-programming of network flows
- Analytics driven orchestration

Requirements

Develop a Virtual Network Packet Broker which supports



High Level Architecture



Challenges Foreseen and Approach

Control Message Processing

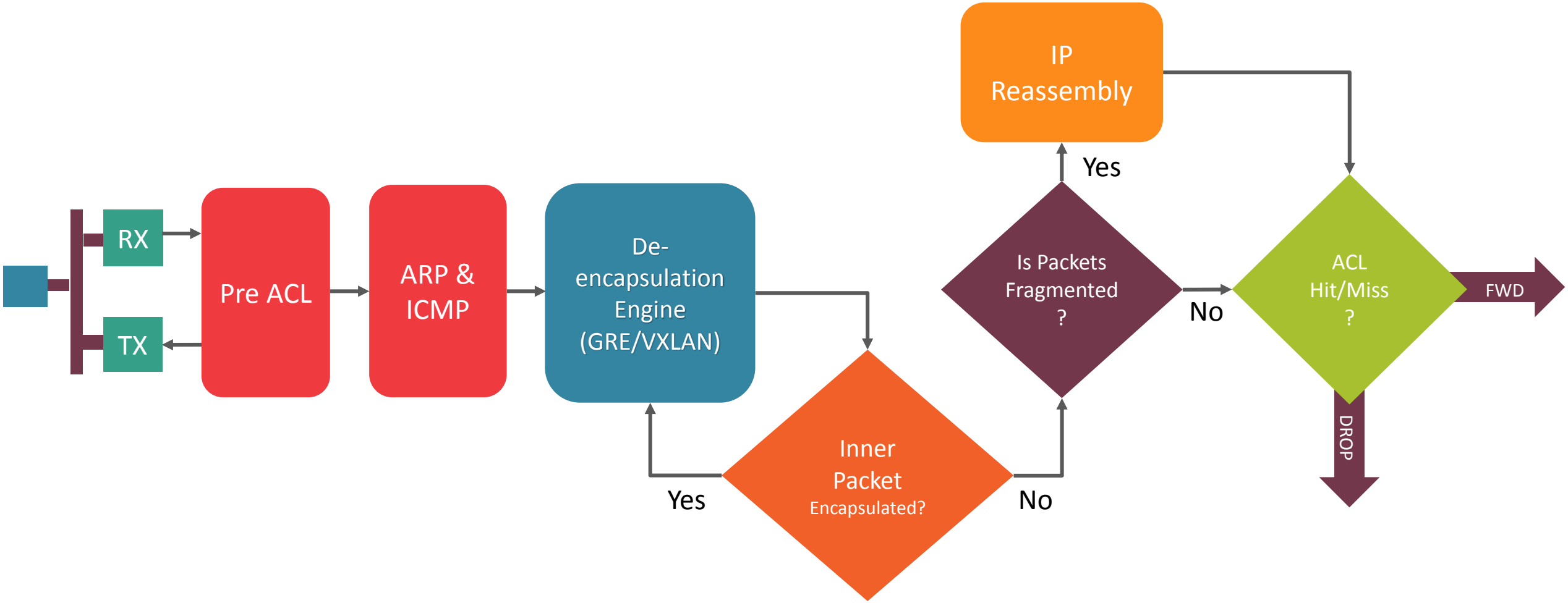
While the Mgmt control messages were processed by Mgmt interface using standard linux IP stack , we had to make provision for other type of control messages like ARP, ICMP.

To handle that, a separate queue was created

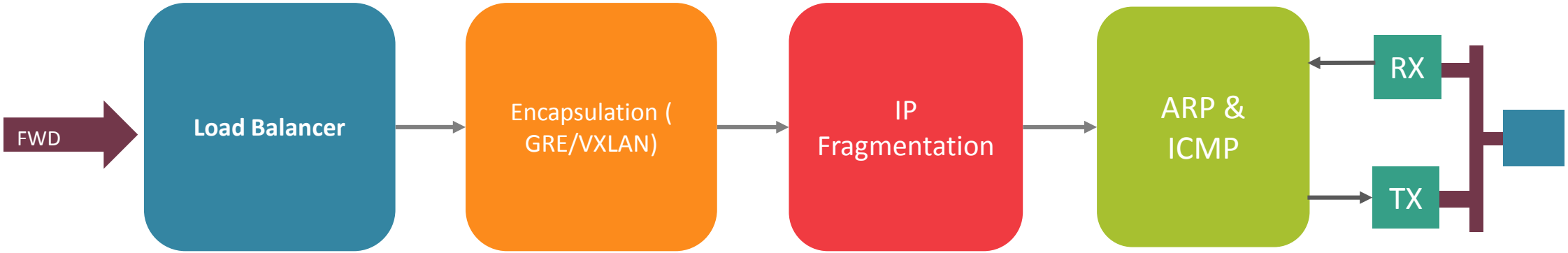
Fragmentation at Egress

There is a possibility of the analysis devices connected to the egress interfaces not supporting Jumbo Frames and in such a case, fragmentation at egress was required to be supported.

Forwarding Agent Ingress Packet Processing (DPDK based)



Forwarding Agent Egress Packet Processing (DPDK based)



Challenges Not Foreseen

Packet Burst Issue

Packets were being dropped when transmitting in burst. A dynamic learning of packet burst threshold was implemented.

Eth Stats Issue

Situation have raised where the packet stat count were going wrong in case of burst errors. Application had take overhead on maintaining local stats

Accomplishments

Happiest Minds delivered the Virtual Network Packet Broker on DPDK resolving the challenges listed above.

The relative throughput performance was at 80% performance , i.e. it is able to provide 80% of the throughput , benchmarked against a vanilla DPDK forwarding application.

Questions / Suggestions ?

Send them to dpdk@happiestminds.com