

OPNFV Rocket project in dataplane acceleration

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Agenda

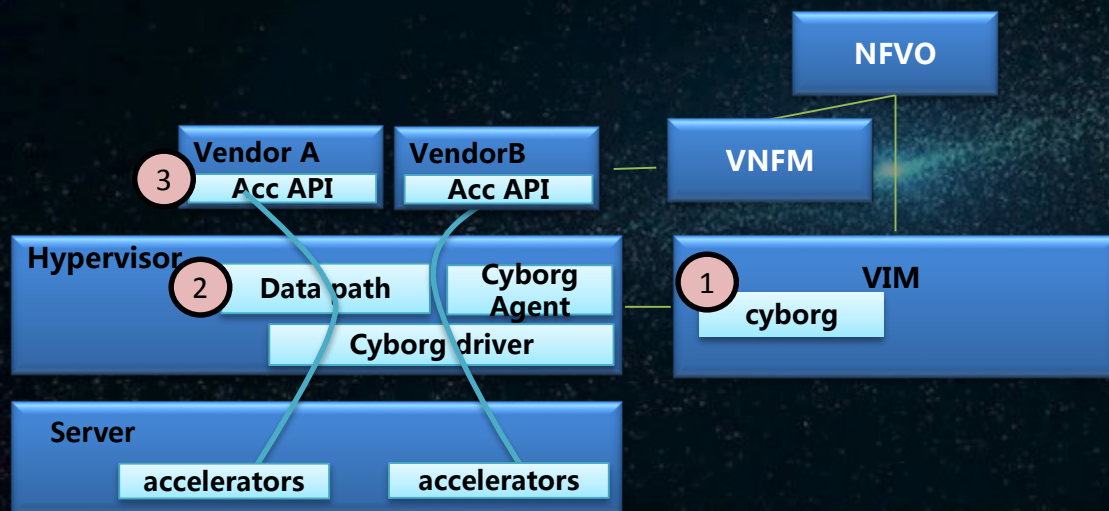
1. Rocket considers
2. GTP offloading

Rocket considers

Purpose for this project:

- Focusing on a reference design on common API in data plane for VNF's service interface with which the VNF could use the accelerators screening manufacturer differences to meet the urgent requirements of performance and power.
- Whole acceleration architecture and accelerator specification
- Testing method of accelerators and effects of acceleration.
- Provide solutions for other acceleration problems.

Rocket considers



- ① ➤ Acceleration management & orchestrator
 - CYBORG
- ② ➤ Network forwarding acceleration-rocket
 - OVS offloading
- ③ ➤ Common api - rocket
 - Data plane
 - Api is different VNF by VNF

Rocket considers

The urgent requirements for VNFs' acceleration

- Analyze and conclude the acceleration requirements of VNFs
- Analyze which function of VNFs are suitable to offload to hardware and how.

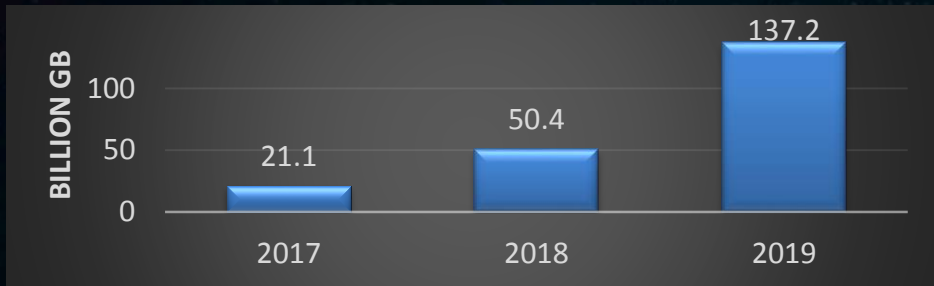
The first step:

OVS offload & vEPC GTP offload.

1. Define test cases for accelerators' specific testing.
2. Compare acceleration effects with legacy method without using accelerators by testing, including performance and power.
3. Test OVS offload and vEPC GTP offload effects, including how many cores are saved using accelerators and how performance improved compared to without using accelerators.
4. Testing environment and hardware accelerators resources will be local environments and resources, and based on testing specifications, testing results should be uploaded to the Rocket project.

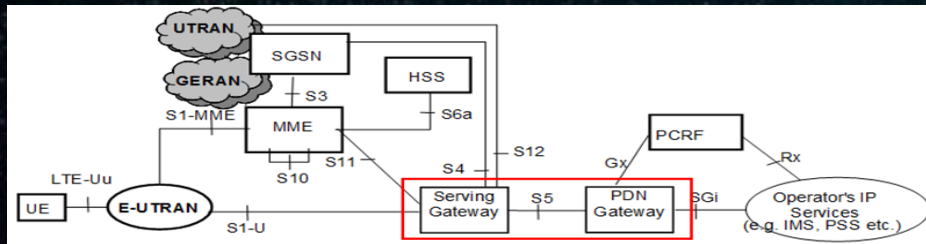
GTP offloading

GW-U/UPF acceleration requirements analysis – focus on data plane



!!!CPU can't meet the data forwarding requirements, or stack CPU

!!!High bandwidth nic increase consumption of a server's computing resources.



GW-U/UPF

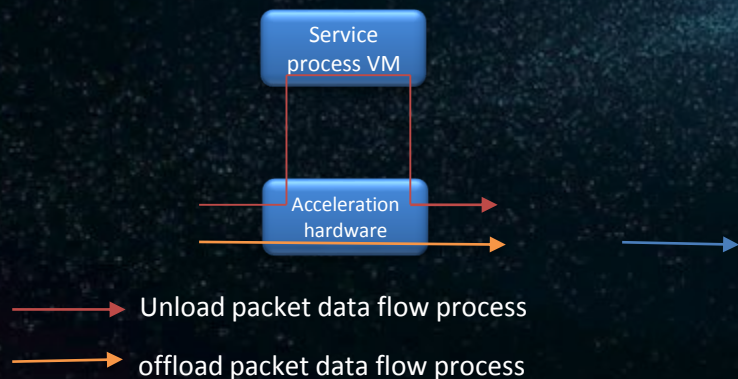
- Computational、data forwarding network element
- GTP protocol process function

GTP offloading

GW-U/UPF service process flow



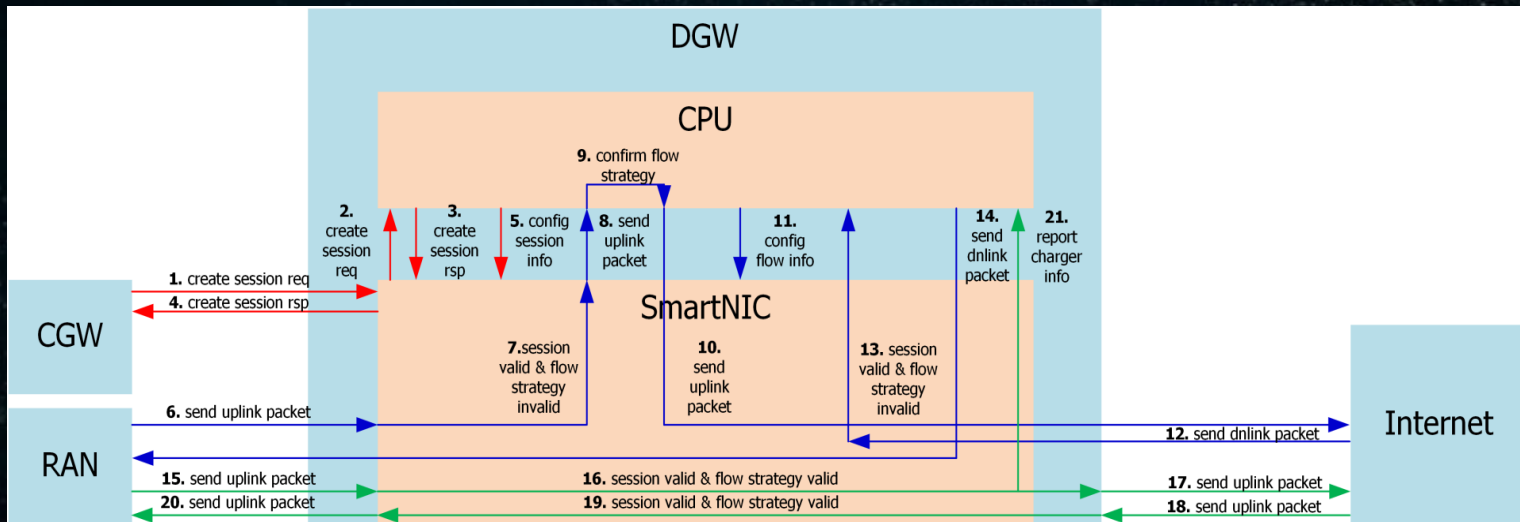
GW-U/UPF VM data flow process



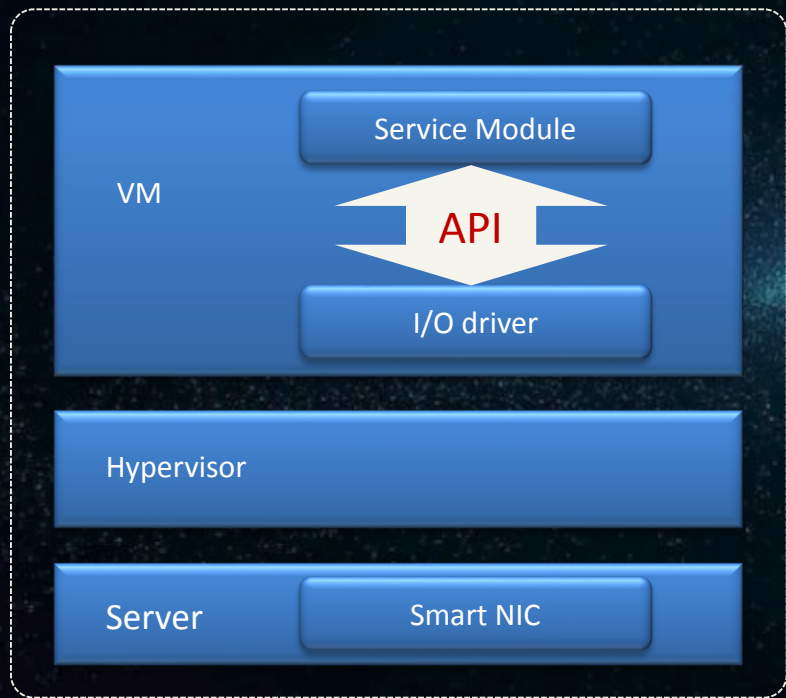
Offloaded function in acceleration hardware

- GTP-U Packet encapsulation and decapsulation
- Rule Lookup: Match flow context and perform traffic rule
- Qos: Marking TOS in IP header
- Charging: Record and report the number and the length of the packet to the service module

GTP offloading



GTP offloading



GTP-U Acceleration Architecture

Interface Position

- The interface is between the Service Module of the VM and I/O driver (SRIOV or VirtIO)

GTP offloading

Major Interfaces

- Flow Table Creation Interface
- Flow Table Update Interface
- Flow table Deletion Interface
- GTP-Tunnel Address Management Interface
- Keep-Alive Request Interface
- Table Resource Monitoring Interface
- Charging Information Reporting Interface

GTP offloading

- Rocket next release plan:
 - The process definition of GTP offloading(done)
 - The common API design for GTP offloading(doing)

- Future research:
 - OVS offloading test
 - GTP offloading test

THANKS!

Q&A

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