





### **Data Processing Acceleration Over OCP Based Solutions**

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## **Cloud and NFV Market Trends**

- 25GbE deployed today, ensure easy transition to 400GbE
- 5G drives more bandwidth demand
- Software Defined Everything
- Virtualized environments Containers & VMs
- High scale
- Secure













### **The Software Defined Data Center**











## **The Virtualized Data Center**

#### Network & Storage **Baseline Services**

- Software Defined
- Scalable
- Secure
- Efficiency & Performance

















#### **Bare Metal Platforms Emerging in the Cloud Driving Forces** Bare VM/ Container Metal Performance Server Security and Isolation Trust shifts into the Smart NIC **TRUST LINE** Hypervisor **OCP SMART OCP NIC NIC Hardware**











### Packets Processing @200GbE is Challenging Packet Processing Requires Accelerator

### 1518B Packet

- 16M packets per second
- 62ns/packet







#### 64B Packet

- 298M packets per second
- 3.3ns/packet







### **SDN and NFV Data Path Needs**





n Packet essing	Encap/ Decap	vSwitch vRouter	Crypto/ Security	Firewall NAT
rvisor Receive	ACCELERA		ACCELERATE	
	10X PPS @ 0% CPU		5x BW @ 80% lower CPU%	

### Open. Together.



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### **OVS over DPDK VS. OVS Offload**

Test	ASAP2	OVS DPDK	Benefit
1 Flow VXLAN	66M PPS	7.6M PPS (VLAN)	8.6X
60K flows VXLAN	19.8M PPS	1.9M PPS	10.4X

Significant Performance Boost @ Zero CPU resources









#### Second 66 MPPs 50 Million Packet Per 4 Cores **0** Cores 30 20 Dedicated Hypervisor Cores 10 7.6 MPPs Message Rate OVS over DPDK **OVS** Offload Message Rate Dedicated Hypervisor Cores







### **Security Must Be Accelerated**

### Denial of Service and Firewalls

SW protection can't scale HW acceleration to the rescue











### Software Defined Network, Storage, Security Transition











### Infrastructure Ecosystem





### Open. Together.

#### Multi Vendor OCP Hardware













## **Multi-Vendor Collaboration is Critical**

### Build an ecosystem together!

- OCP hardware support
- Hardware independent API
- Open software
- Define use cases and needs
- Make it standard









## **Smart NIC Hardware Interface**

OCP NIC 3.0 addresses all Smart NIC HW needs

New interfaces

- UART
- USB

#### Make sure they are connected!

### Baseboard Management

Controller

USB\_DATp

USB\_DATn









#### UART Connection Example









### **Open APIs**

- Network, Storage, Security Enablement SDK





#### Host CPU (Bare Metal / Virtualized Server)





## **Network Virtualization using NIC ASAP<sup>2</sup>**

Accelerated Switching & Packet Processing

### ASAP<sup>2</sup> Benefits

- Uncompromised performance
- CPU savings
- Full isolation
- Same solution for VM and BM
- OS/HV agnostic
- Security extensions

#### Opensource standard APIs

- Linux Kernel TC
- DPDK rte\_flow















## **Storage Virtualization using NIC NVMe SNAP**

Software-defined NIC for Accelerated Processing

### NVMe SNAP Benefits

- Uncompromised performance
- CPU savings
- Full isolation
- OS/HV agnostic

#### **Opensource standard APIs**

- SPDK
- Includes storage toolkit rich feature
- Kernel infrastructure can be used













## **Call to Action**

OCP to support a standard open API for packet acceleration that will maximize data center efficiency

- Agree on what to accelerate & roadmap
- Agree on what APIs
- Add it to OCP NG.0











### **Mellanox OCP NIC 3.0 and Switches** www.mellanox.com/ocp/





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#### SN2700 Open Ethernet Switch





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