



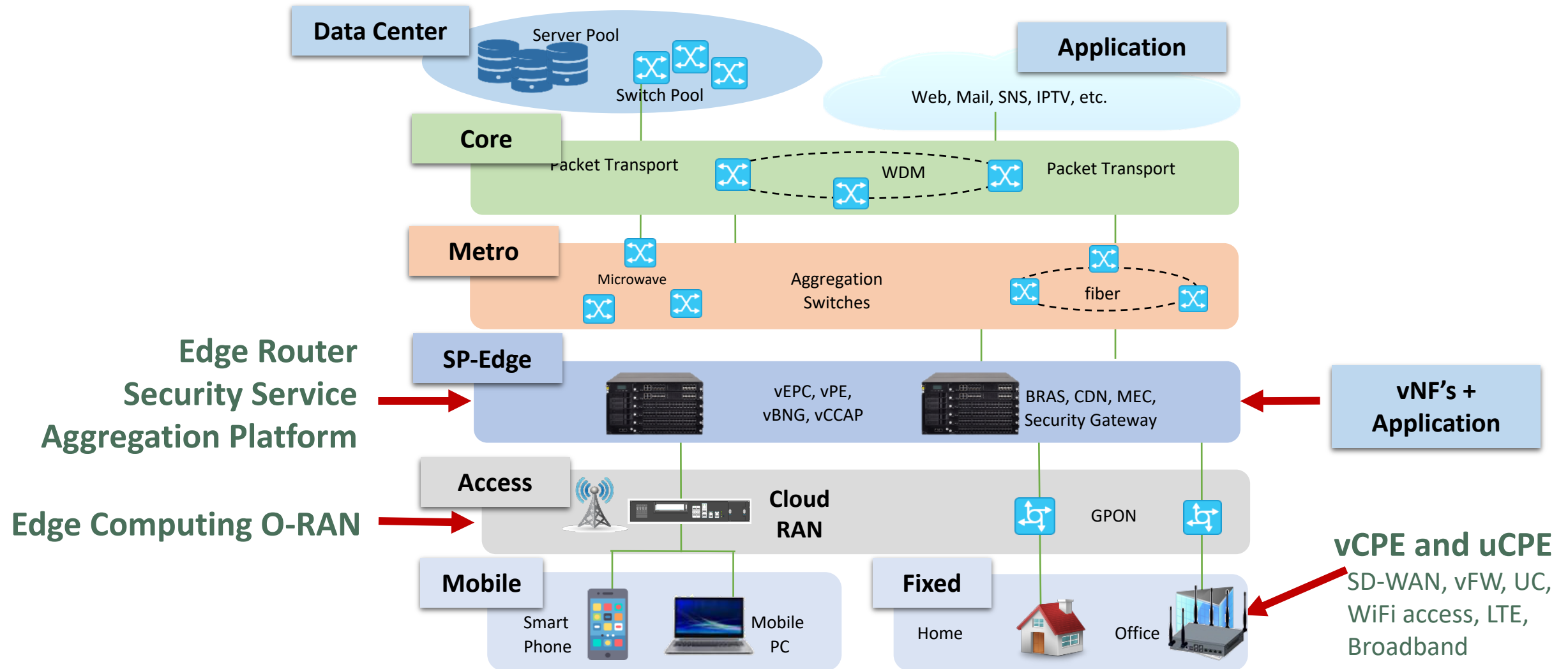
Disaggregating Network with Whitebox Solutions

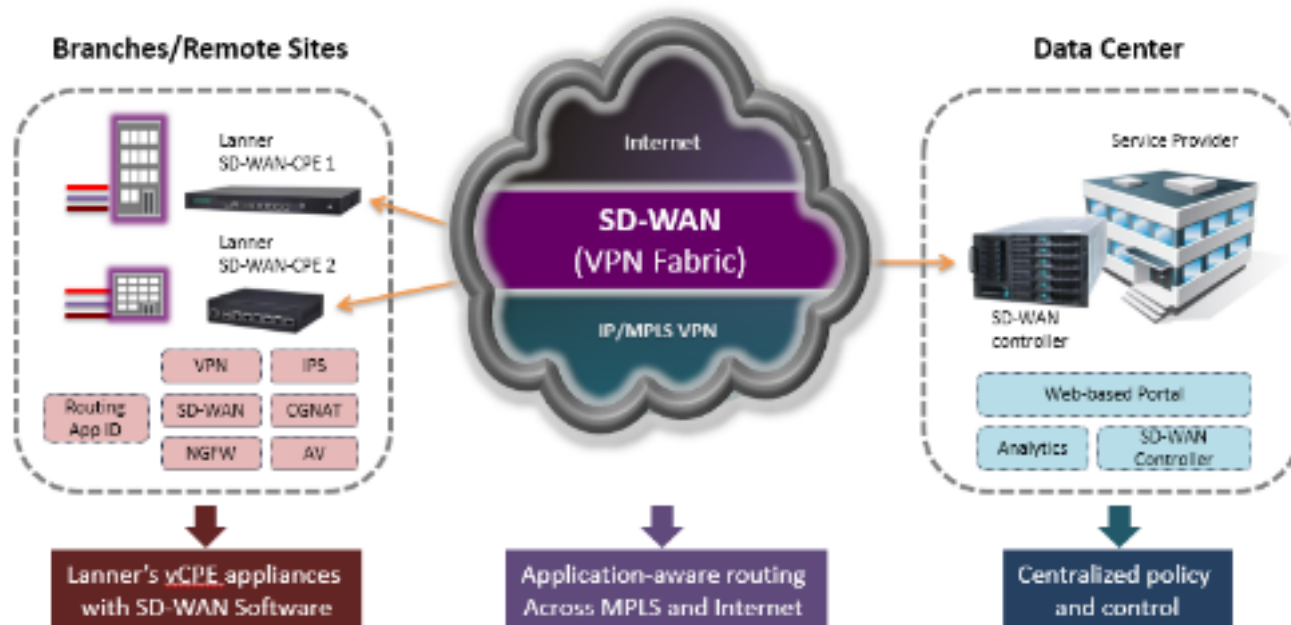
Sven Freudenfeld, CTO TABU

Lanner

Leader in Advanced Next-Gen
Network Edge Revolution

High level Network Topology





uCPE/vCPE Platform

- uCPE Pre-validated by 30 partners to accelerate SDN/NFV time-to-market deployment for SI and TEM
- Deployed in enterprises, retail chains, and distributed branches for more than 200,000 devices.



NCA-1515

4~16C Intel Atom
4x4 LTE/WiFi



NCA-2510

4~16C Intel Atom
10G SFP+ / NIC



NCA-5520

8~28C Intel Xeon
4x NIC / Dual PSU



NCA-5710

16~56C Intel Xeon
4x NIC / Dual PSU

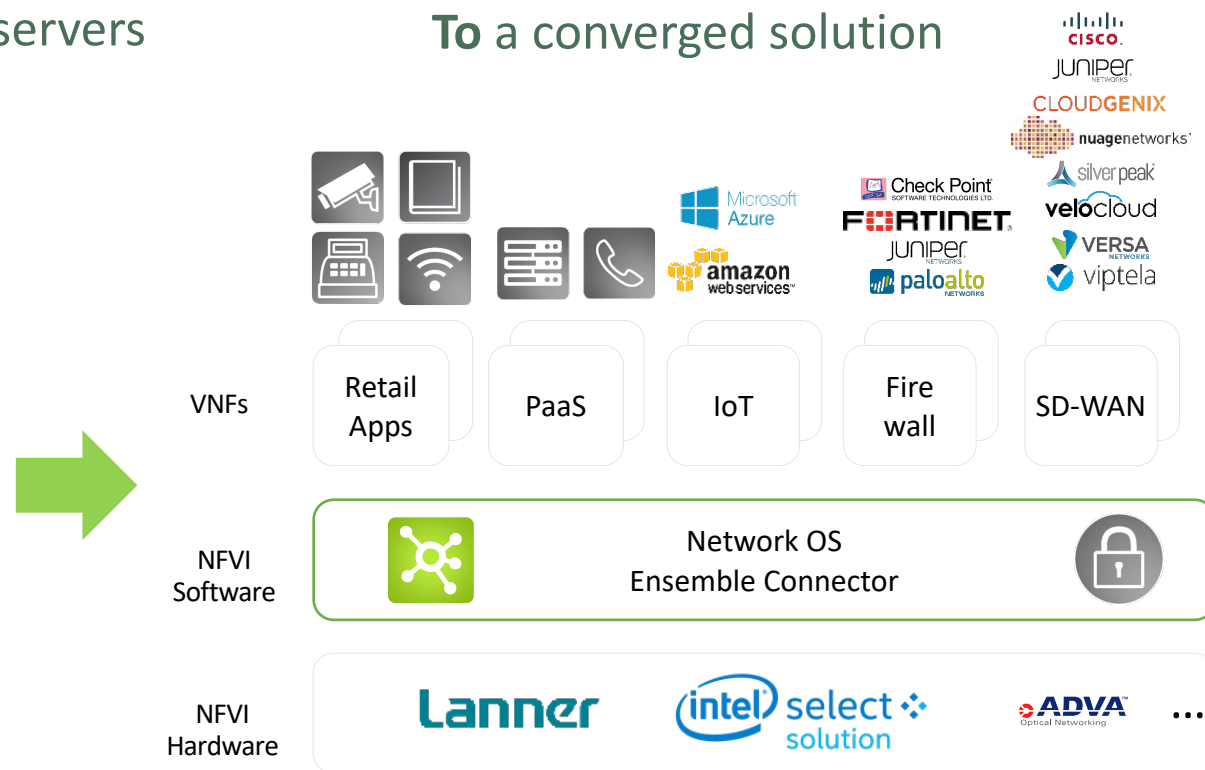
<p>OSS / BSS Orchestration</p>					
<p>VNF</p>	<p>SD-WAN & Routing</p>	<p>Security</p>	<p>MEC/SD Switch</p>	<p>vBNG / vCGNAT</p>	<p>Assurance</p>
<p>NFVI</p>					
<p>White Box Platforms</p>					
<p>Silicon</p>					

Use Case: ADVA uCPE for Edge Cloud Retail

From discrete appliances and servers



To a converged solution



NCA-1515 Certified ADVA Ensemble Connector
uCPE on Verizon Wireless Network



Joint Solution with Ekinops for SMB, Branches & Retail

Lanner



Targeted towards SMB, Branch Offices & Retail

Lanner

NCA-1515



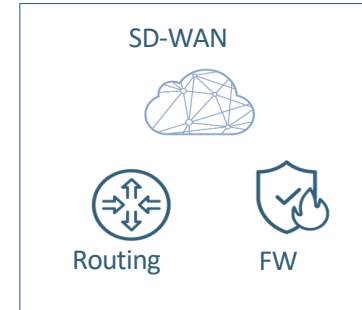
Pre-installed with OS6

4, 8, or 16 core

Optional LTE Module



Optional Built-in Services



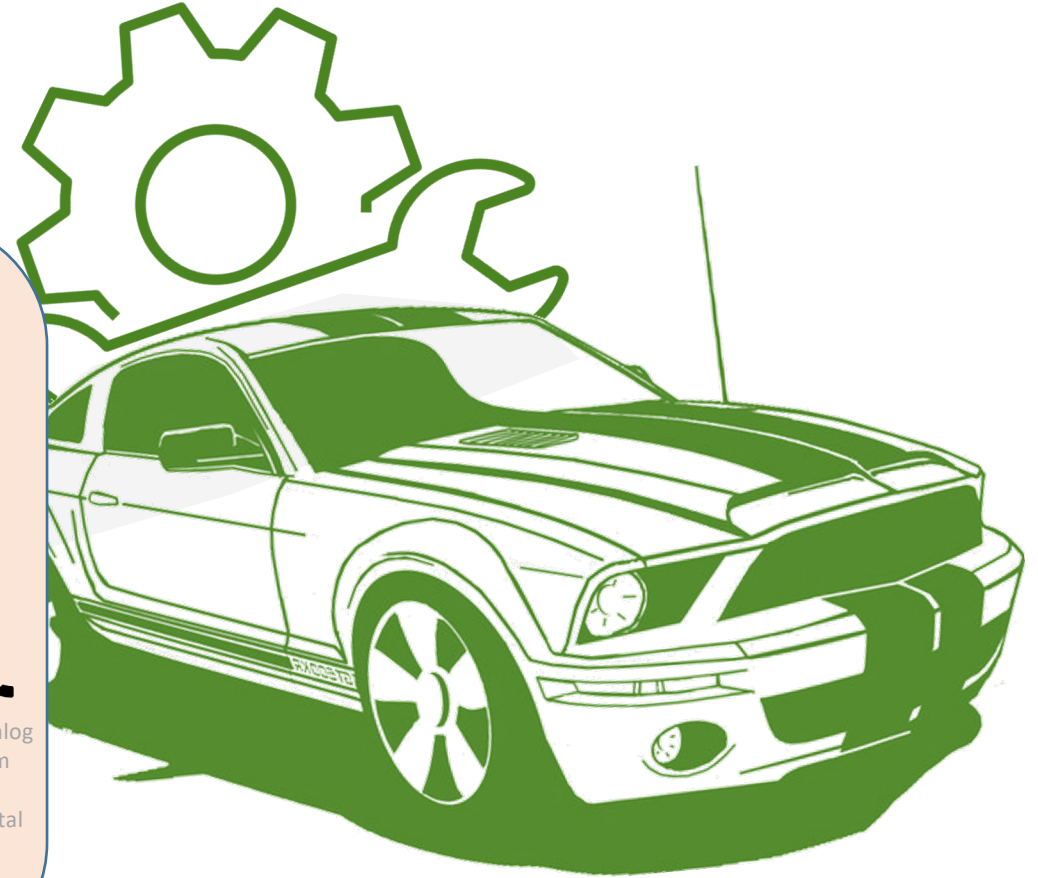
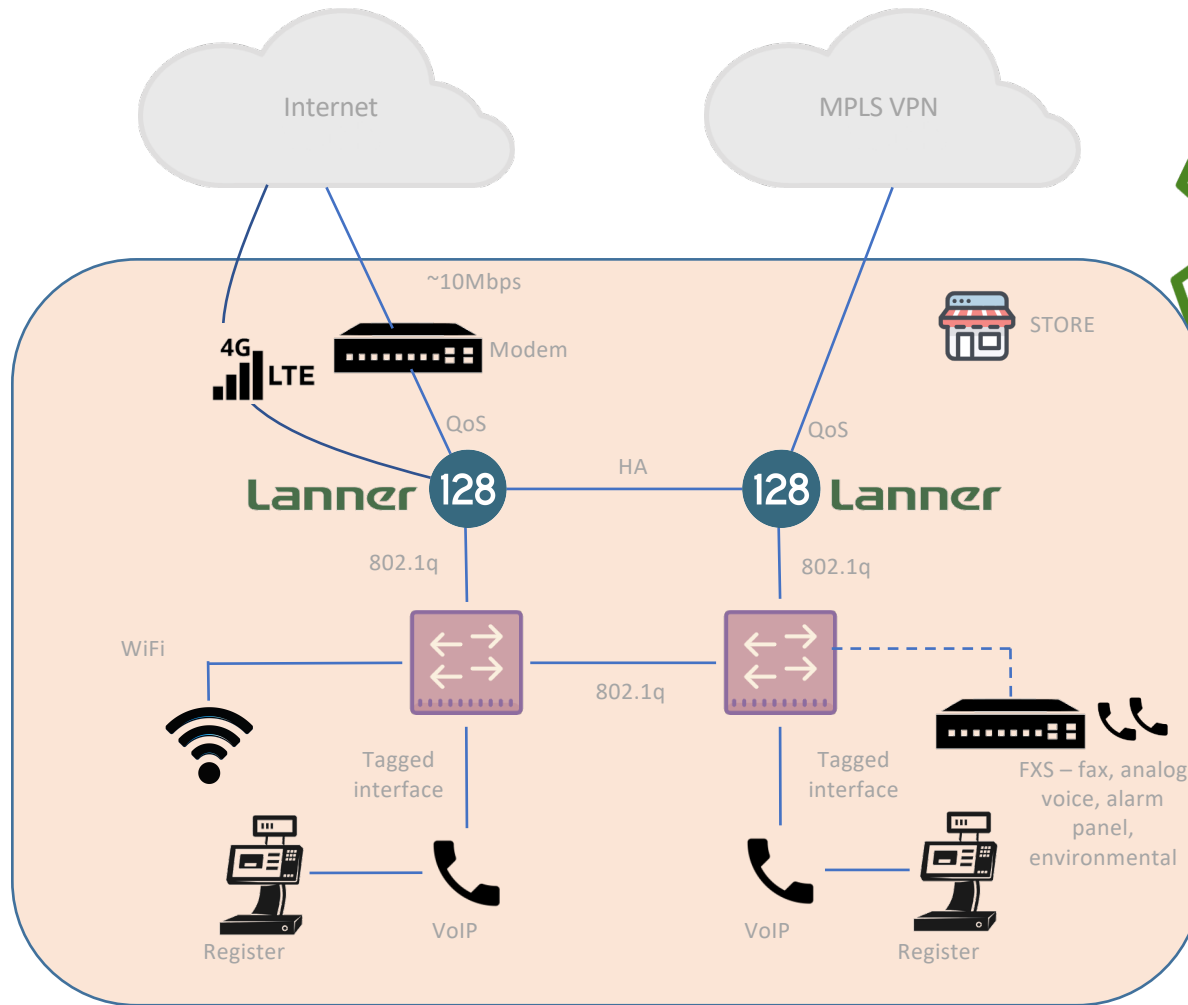
Optional Ekinops VNF



Pre-validated 3rd Party VNF – certified by both Lanner and Ekinops

SD-WAN	velocloud	vmware	silverpeak	nuagenetworks	cisco	VERSAsolutions	viptela
QoS	riverbed	infovista	ixia	netrounds			
FW	Check Point	FORINET	Barracuda	paloalto	WatchGuard		
IT	debian	ubuntu	RUCKUS	ZABBIX			
	kubernetes	RANCHER					

Use Case: Retail SD-WAN Solution with 128 Technology



Remote Testing

Expedite Business

- ⦿ Debugging
- ⦿ Platform Evaluation
 - Early Access
 - Performance Test

**Go-to-market Faster
with Automated
Testing.**



9 Months



V.S.

3 Months

Lanner Electronics Inc NCA-1515/L-1515

Key features

- 1. Intel® Atom® C3000 (Denverton)
- 2. Max. 4x GbE RJ45 w/ 1 Pair of Gen3 Bypass, 2x GbE SFP w/ LED & 2x GbE RJ45 (See SKU)
- 3. 2x 260-pin SODIMM (by SKU), DDR4 2400/2133/1866MHz ECC SODIMM, Max. 32GB
- 4. 1x RJ45 Console, 2x USB 2.0, 1x Onboard EMMC 8G, 2x Nano SIM for M.2
- 5. 2x Mini-PCIe (PCIe / USB 2.0), 2x M.2 2242 B Key (USB 3.0)



Lanner Electronics Inc
NCA-1515/L-1515 - ADVA
Ensemble Connector



Lanner Electronics Inc
NCA-1515/L-1515 - ENEA
uCPE



Lanner Electronics Inc
NCA-1515/L-1515 - Ekinops
OneOS6



Lanner Electronics Inc
NCA-1515/L-1515 - Versa
FlexVNF

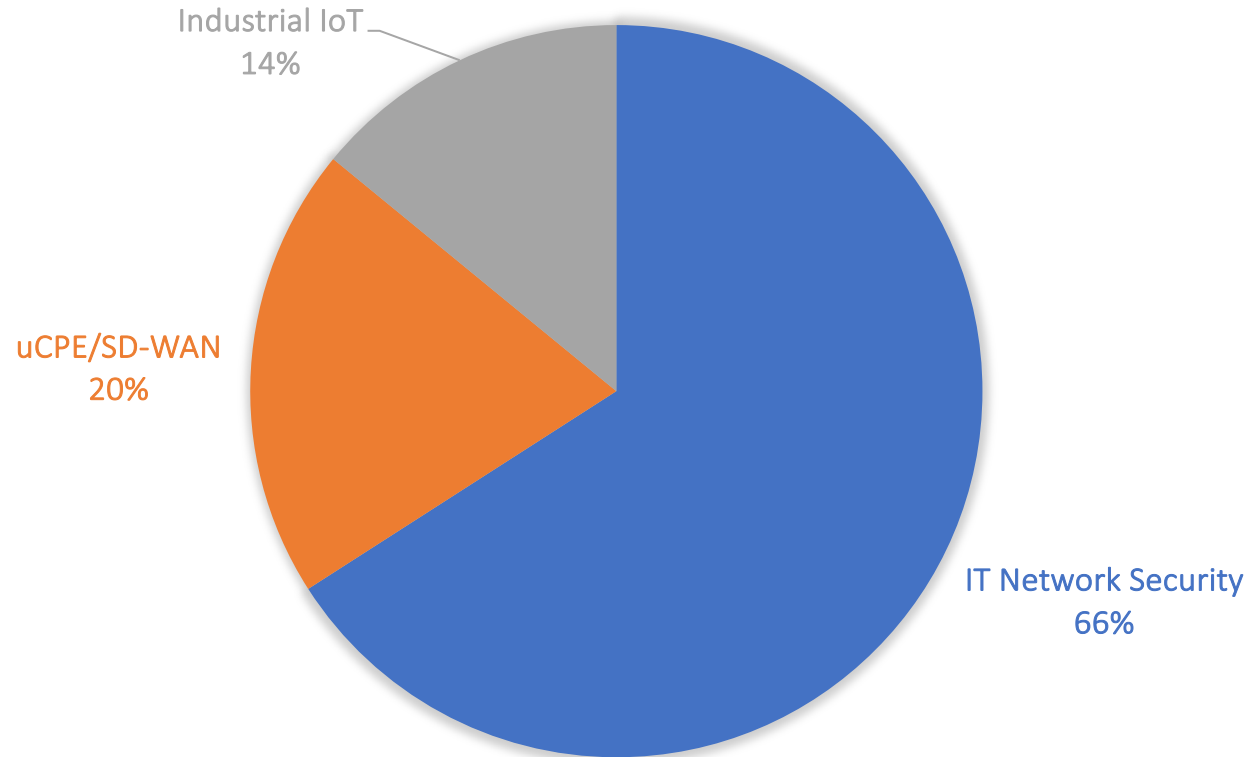


Lanner Electronics Inc
128 Technology Session
Smart Router Appliance

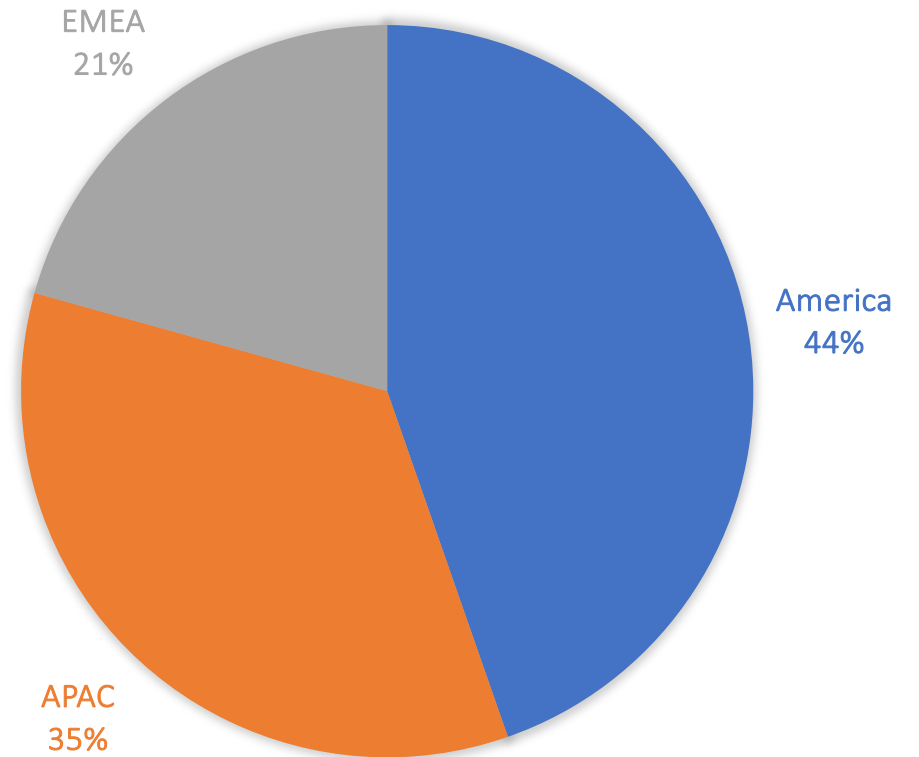


Lanner Electronics Inc
Roqos Core RC150 Cellular
Cybersec...

MARKET SEGMENTS



GLOBAL MARKET SHARE

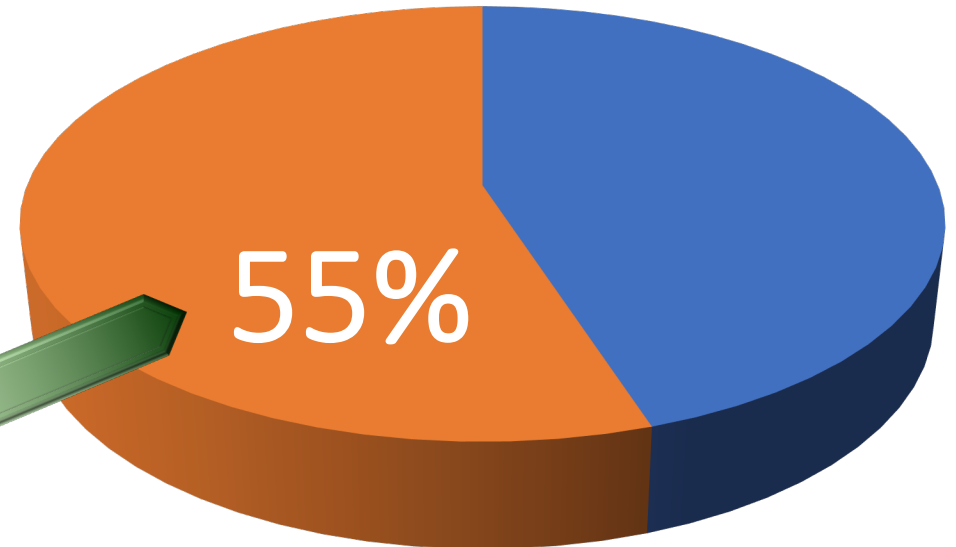


The Leader in vCPE/uCPE Platforms

Lanner is the leading vCPE / uCPE hardware provider behind major SD-WAN solution providers. Among the 20 leading companies in the 2019 Gartner Magic Quadrants Report for WAN Edge Infrastructure*, 55% Choose Lanner vCPE and uCPE platform.

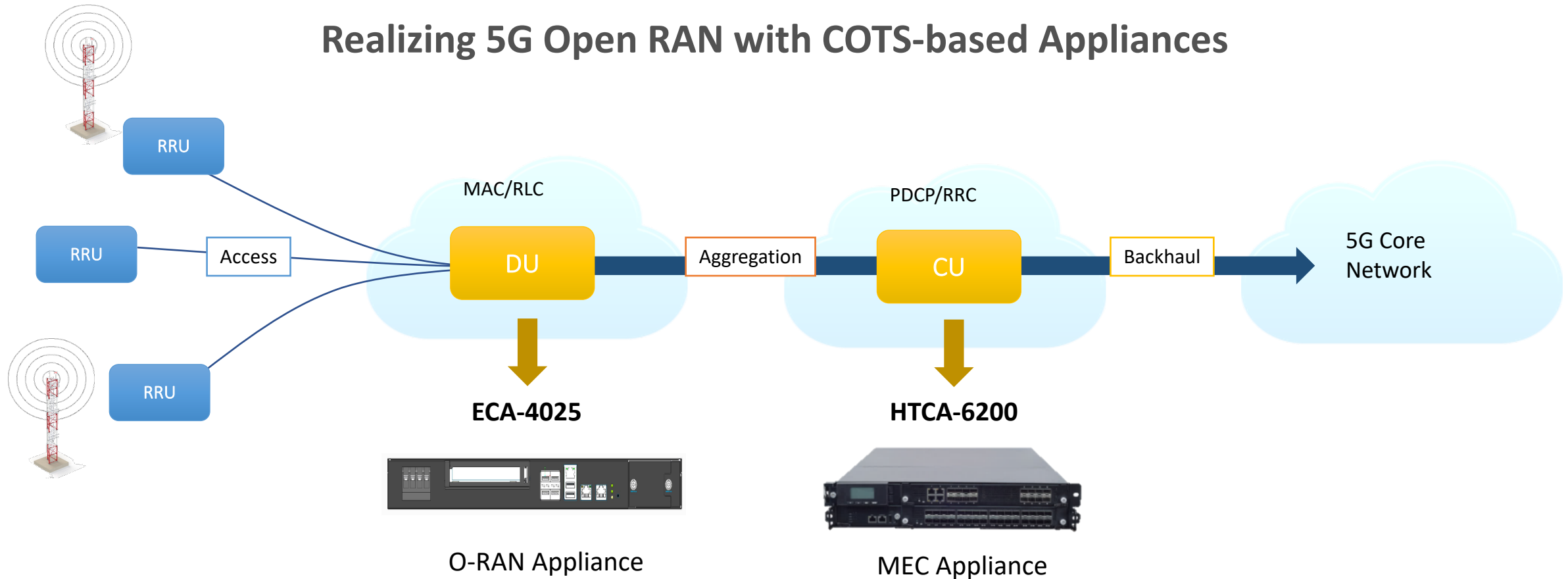


Gartner®



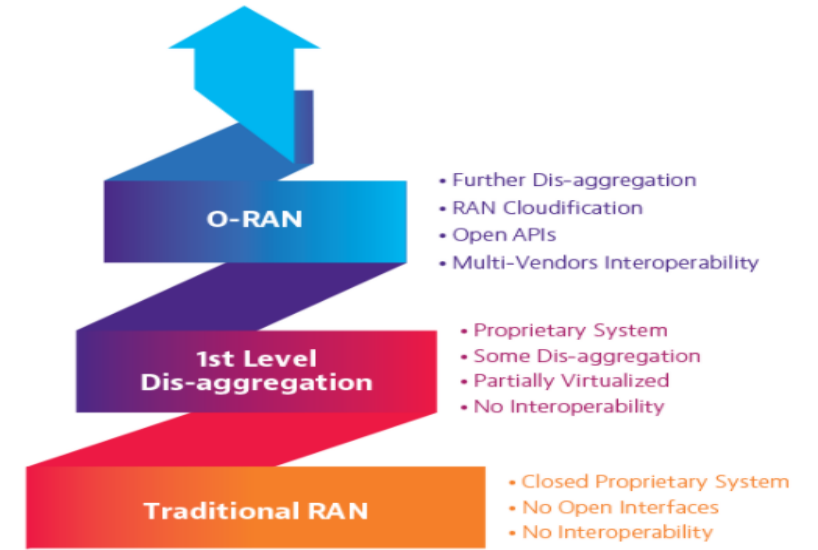
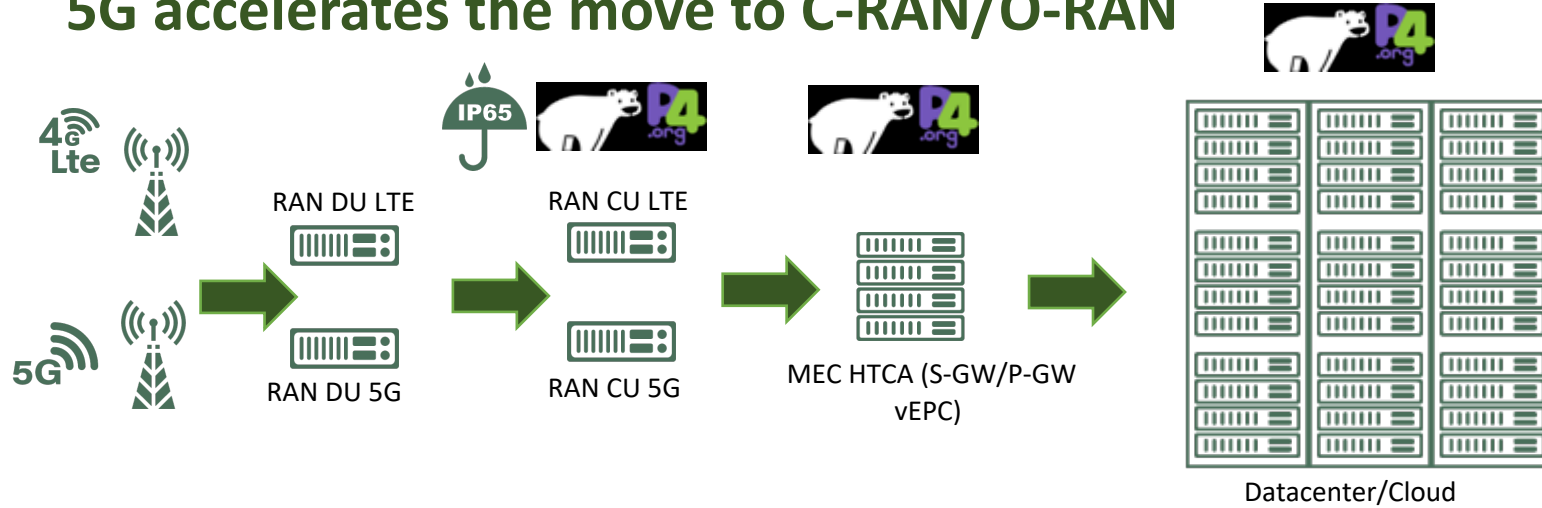
*2019 Magic Quadrant for WAN Edge Infrastructure

Realizing 5G Open RAN with COTS-based Appliances

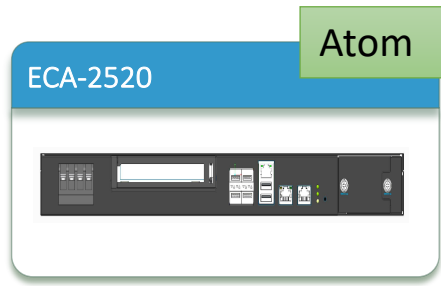


Open RAN/ SD-RAN as Whiteboxes

5G accelerates the move to C-RAN/O-RAN



- ⊙ Xeon-D Multi Core up to 16
- ⊙ 9~54 DC input
- ⊙ Wide operating temperature
- ⊙ Side by side cooling design
- ⊙ Time synchronization
- ⊙ Short depth 300mm



- ⊙ Atom Multi Core
- ⊙ 9~54 DC input
- ⊙ Wide operating temperature
- ⊙ Side by side cooling design
- ⊙ Time synchronization
- ⊙ Short depth

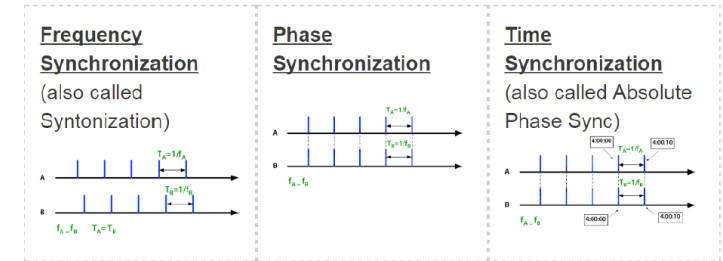


- ⊙ Xeon D Multi Core up to 16
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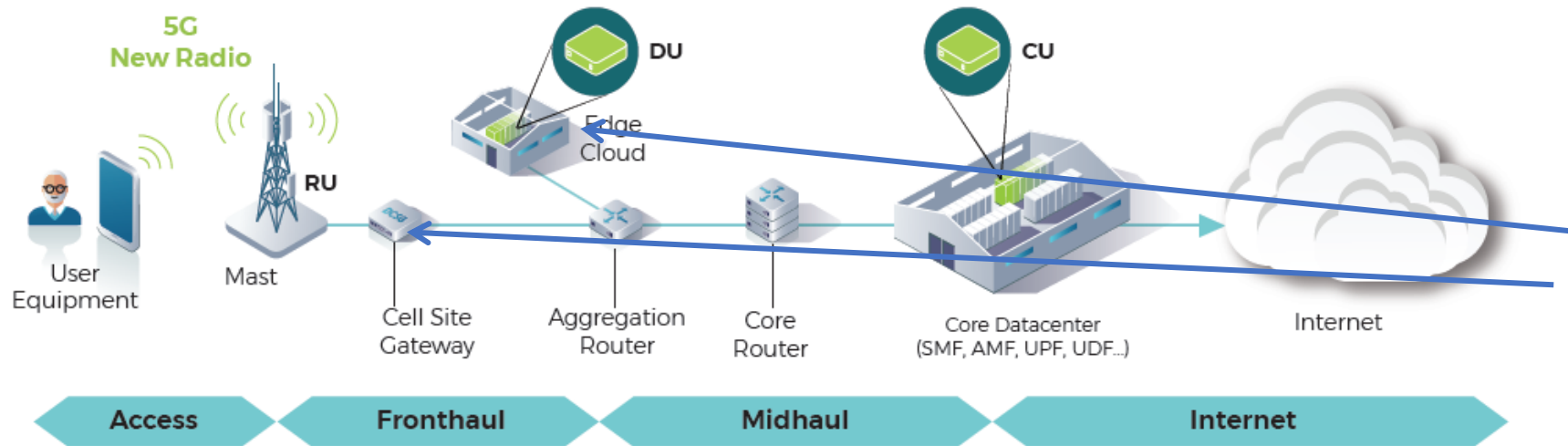
Fun with IEEE-1588v2

- The **Precision Time Protocol (PTP)** is a protocol used to synchronize clocks throughout a network. On a LAN, it achieves clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems. PTP is currently employed to synchronize financial transactions, mobile phone tower transmissions, sub-sea acoustic arrays and networks that require precise timing but lack access to satellite navigation signals.

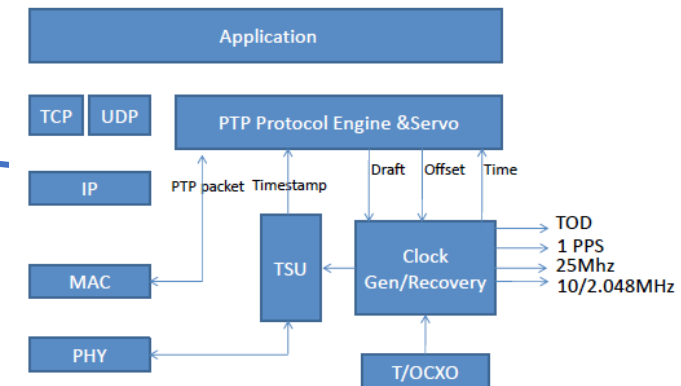
Packet-Based Clock Synchronization



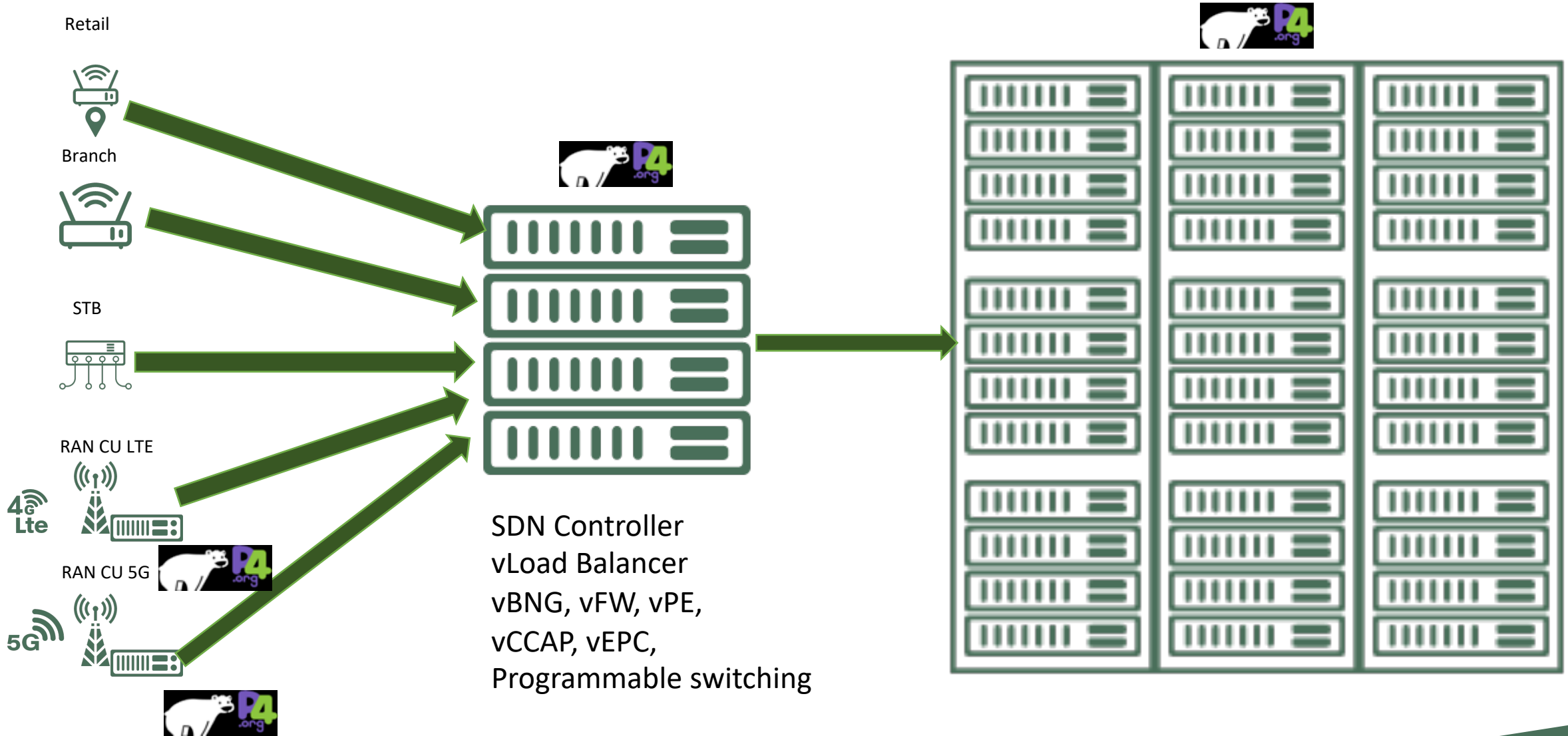
MEF Reference Wiki

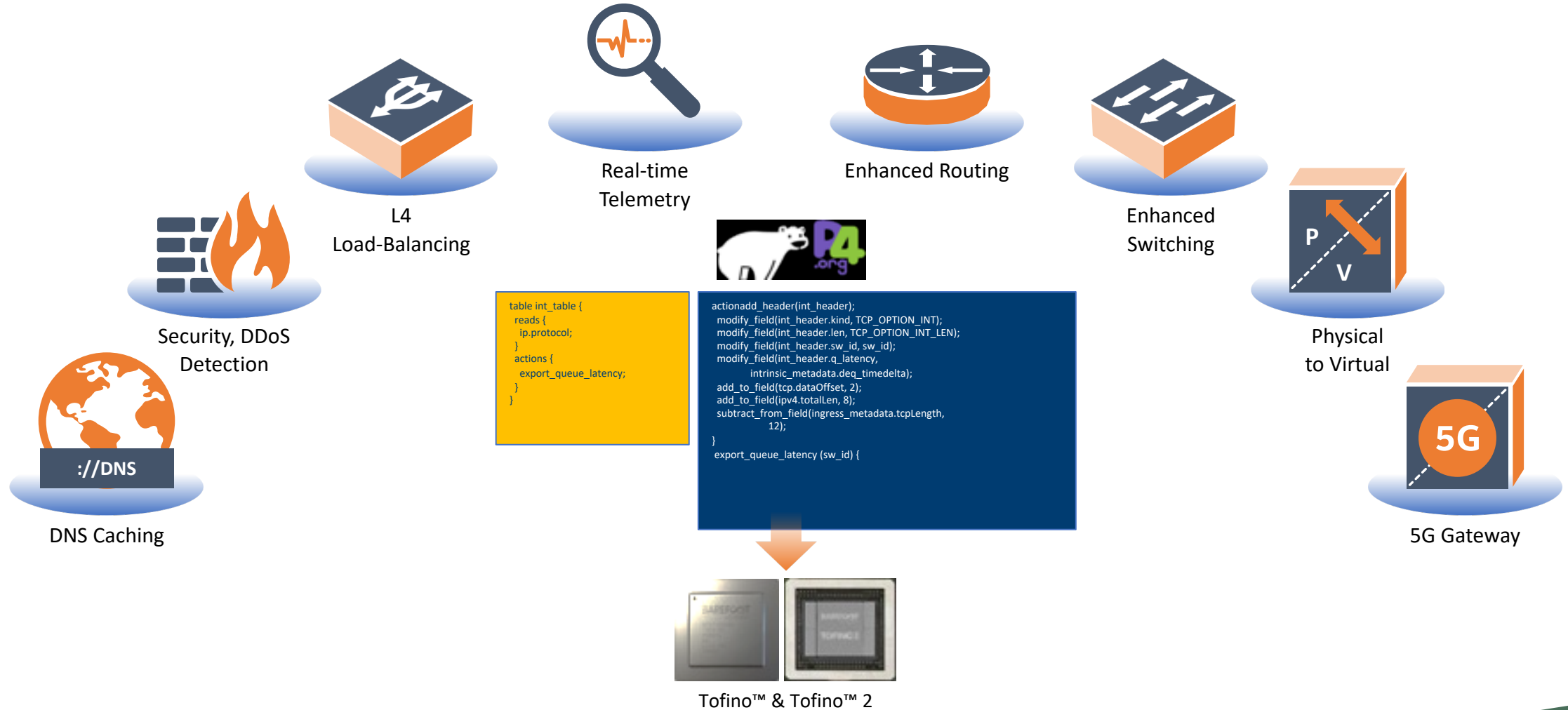


IEEE1588v2 PTP Functional Block



Service Provider Edge - MEC





MEC Whitebox with Programmability

Lanner HTCA-6600: 2nd Gen Intel Xeon Scalable Family / Barefoot Tofino™ Switch Integration

Application Ready MEC Platform



Compute



Network



Storage



Virtualization



P4 Programmable Edge

Legacy silicon relies on legacy protocols
Carrier Edge needs programmable networks
not based on legacy protocols

- Adaptable to support new features
- Software defined for automation

Better Visibility

Provide visibility into the operational health
of the platform and the performance of the
VNFS

- In-band Network Telemetry (INT) for VNF performance
- Monitor the operational performance of the network

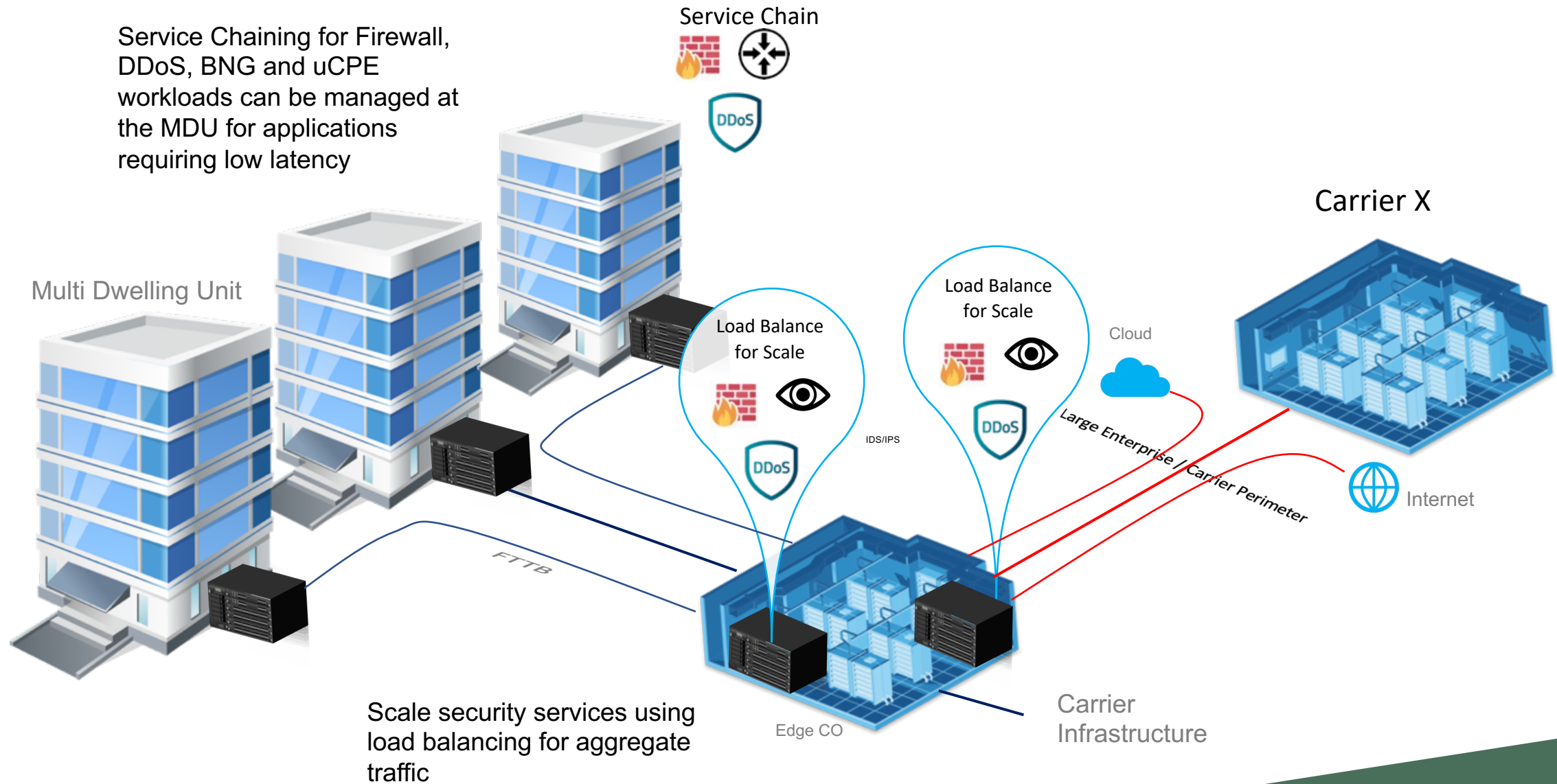
Scalable Architectures

Collapse multiple appliances on Tofino
Scalable network, compute and applications

- NoviFlow uses the network to scale across multiple virtual machines and blades

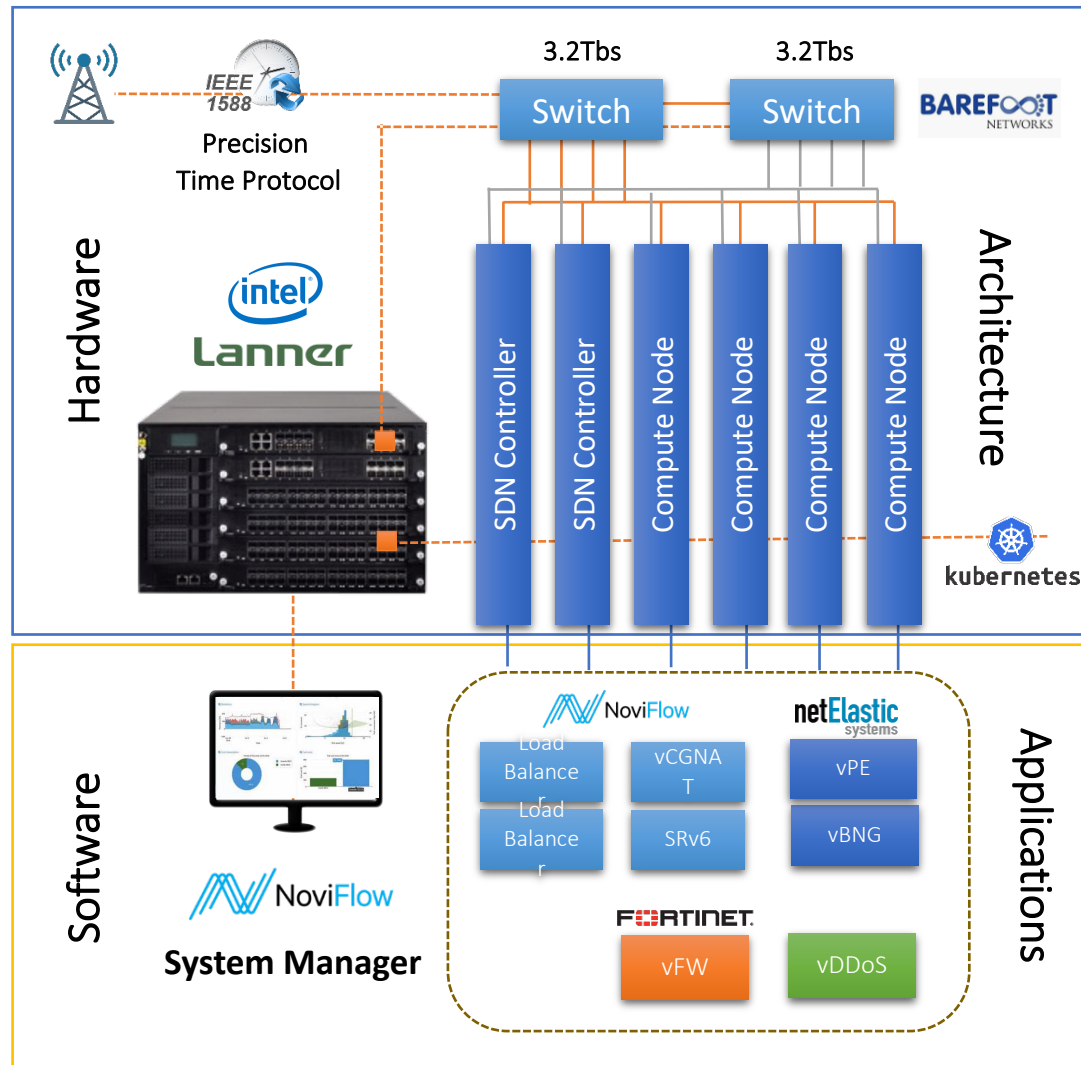
MEC Whitebox use case

Service Chaining for Firewall, DDoS, BNG and uCPE workloads can be managed at the MDU for applications requiring low latency



Scale security services using load balancing for aggregate traffic

Service Provider Edge - MEC

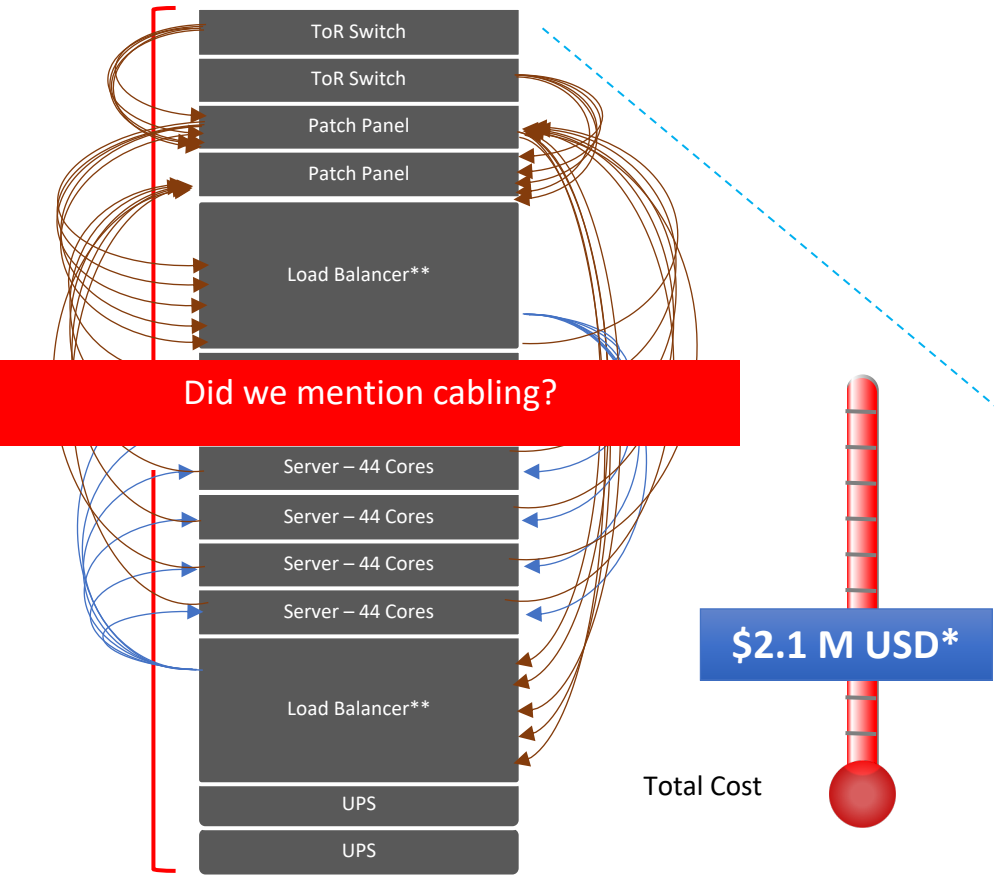


Lanner and Noviflow to jointly develop all-in-one MEC solution. The joint solution optimizes data flow, minimizes latency, and optimizes the utilization and allocation of compute resources and energy. Not only performance is boosted, operating expenses and hardware investments have also been reduced.

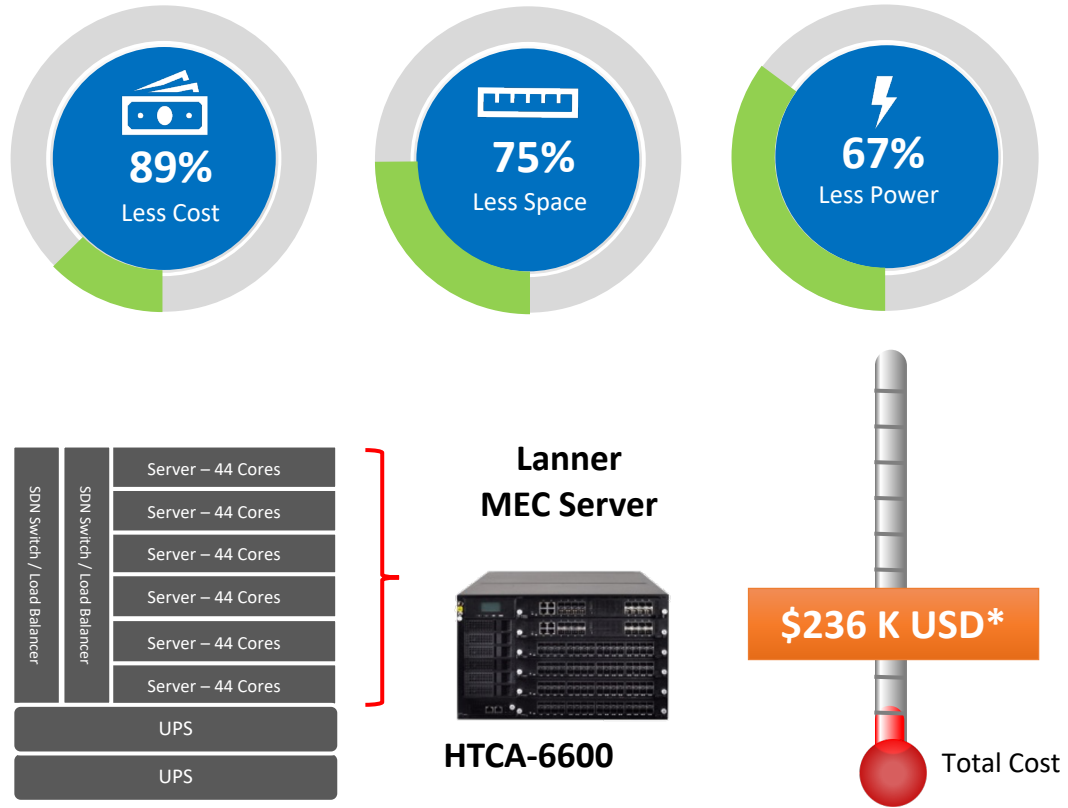
Lanner MEC server [HTCA-6600](#), accompanied with HLM-1100 module as the white-box MEC hardware platform. [HTCA-6600](#) aggregates up to 12x 2nd Generation Intel® Xeon® Scalable processors and two high-speed P4-programmable Barefoot Tofino switching ASICs by HLM-1100 to boost hardware performance for MEC infrastructure.

Converged MEC Server Reduces TCO on Edge Cloud

Traditional Architecture



Converged MEC Platform



Lanner

Thank You

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www.lannerinc.com

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All product specifications are subject to change without notice.