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Telecommunication

Innovative Platforms for Next Generation 5G Edge Infrastructure





Unleashing the Power of 5G

Telecom service carriers are transitioning from legacy fixed-line, proprietary hardware to more versatile infrastructure utilizing advanced software technologies, such as SDN and NFV, to virtualize and offer more services over the cloud. The potential benefits include reduced CAPEX, flexible scalability, shorter development time and lower investment risk for functional upgrades. Since SDN and NFV are complementary and synergetic, the opportunity around the network software will be more dynamic than ever for the industry, and by 2020, it is expected that the emergence of 5G specifications will totally transform business service models for MSPs.

As more leading service providers are realizing the benefits of SDN and NFV to their business advantage, Lanner, the global supplier in networking platforms, has taken the mission to assist operators in the transition from traditional network infrastructures to today's agile and flexible architectures by supplying optimized and proven networking hardware for SDN and NFV deployments in telecommunication services.

Lanner has a high level of expertise and experience in the design and customization of network computing platforms, covering uCPE, vBNG, vEPC, vIMS, vRAN, SD-WAN, MEC and carrier-grade network security. Throughout 30 years of establishment, Lanner has supplied millions of custom solutions to help enterprises boost their competitiveness. Since 2016, Lanner has formed partnerships with ADVA, Versa Networks, Ekinops, Verizon, Juniper, Turnium and NoviFlow, and achieved TL9000 certifications for telecom quality management.


With the anticipation of 5G widespread adoption around 2020, it is expected that more than 90% of service providers will be SDN/NFV ready, and Lanner is determined to offer the optimal hardware solutions that will help clients in their transitions to the next generation software-based network infrastructures.

Jeans Tseng
CTO




With the advances in networking technologies like SDN and NFV, communication service providers and carriers benefit from the flexibility and the agility to evolve their new services. Designed for next generation network virtualization, Lanner provides carrier-grade, NEBS-compliant communication platforms featuring extreme computing power, modular I/O flexibility, WiFi/LTE connectivity and full redundancy design. These high-availability SDN/NFV ready platforms are ideal to work as virtual CPE, virtual Router, NFVi appliance and MEC platforms for today's telecom environments.

SD-WAN uCPE



uCPE devices for SD-Security, SD-WAN and other VNF in access networks

Hyper Converged Infrastructure



HCI-ready platforms with multi-node compute, switching and storage in one single appliance

Mobile Edge Computing



MEC servers deployed at edge data center for ultra-low latency, high bandwidth content delivery

5G Edge Open RAN



NEBS compliant network platforms for virtualized cloud-based radio access networking at CORD

Outdoor Edge Computing



5G-WiFi 6 ready platforms for telco central offices, data centers in core networks

vRouter vBNG



Customizable and scalable whitebox hardware platforms for vRouter and vBNG



Intel

Lanner is an Associate Member of the Intel® Network Builders Partner, a community of SDN/NFV developers, system integrators, OEMs and solution providers committed to the development of modular, standards-based solutions on Intel® technologies.



Verizon

Verizon is one of the world's leading providers of technology and communications services. The company offers voice, data and video services and solutions on its award-winning networks and platforms.



Juniper Networks

Juniper Networks is dedicated to dramatically simplifying network operations and driving superior experiences for end users.



Versa Networks

Versa Networks is an innovative vendor in the SD-WAN and SD-Security market. Versa solutions enable service providers and large enterprises to transform the WAN and branch networks to achieve unprecedented business advantages.



ADVA

ADVA Optical Networking SE provides network equipment for data, storage, voice and video services. ADVA Ensemble Connector is a highly scalable, high-performance virtualization platform for hosting multi-vendor VNFs.



Ekinops

Ekinops is a leading provider of open and fully interoperable Layer 1, 2 and 3 solutions to service providers around the world. They offer high-capacity optical transport as well as virtualization-enabled managed enterprise services.



Turnium

Turnium was developed to provide channel partners such as IT Resellers, Consultants and Service Providers with a turn-key managed SD-WAN solution.

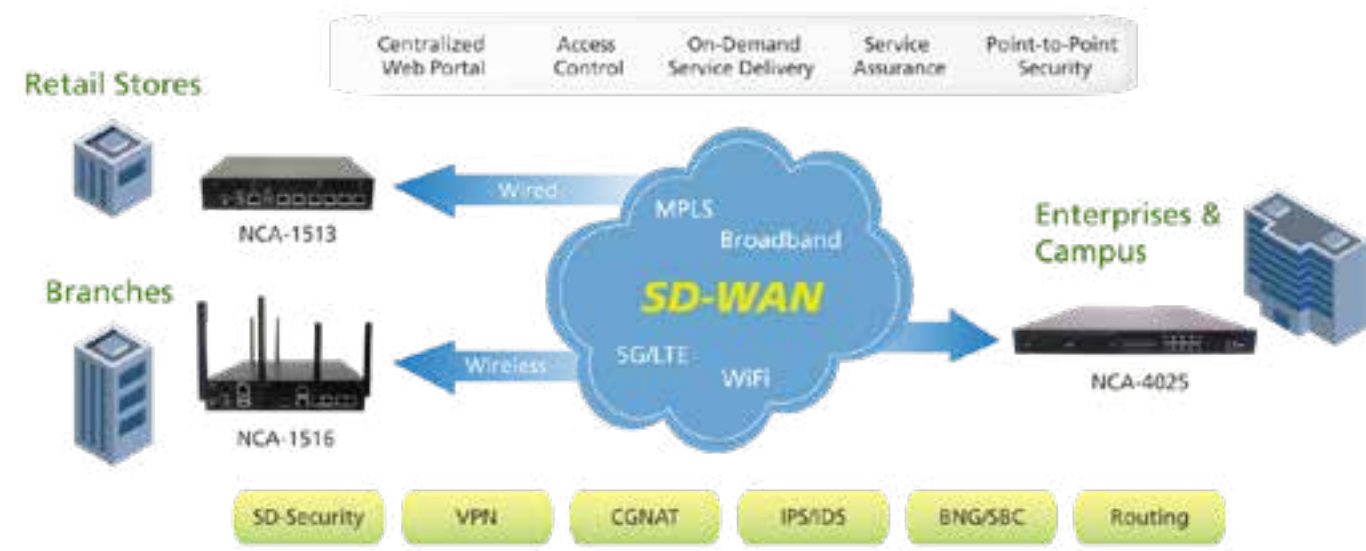


NoviFlow

NoviFlow is one of the world's leading vendors of High-Performance SDN Network Operating Software (NOS), Cybersecurity Load Balancing and Programmable Network Solutions to network operators, data center operators, enterprises and government.

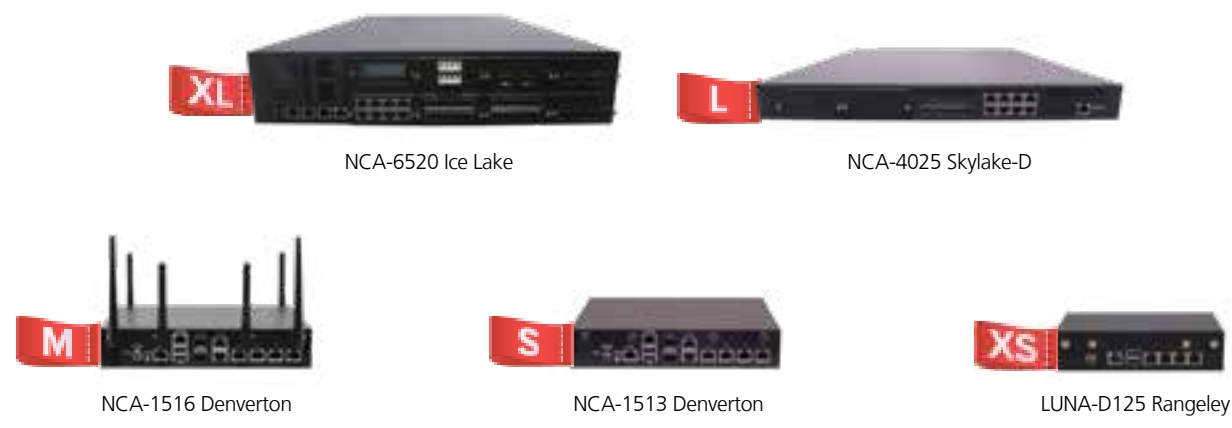
SD-WAN & Universal CPE

SD-WAN is becoming the most anticipated WAN Services today. According to the latest Gartner Report on WAN Edge Infrastructure, in next 5 years more than 90% of WAN edge infrastructure will be based on vCPE platform or SD-WAN versus traditional router for managing network connectivity and resources from distributed branches to data center and the cloud.



Wide Range of uCPE Platforms for SD-WAN

Lanner has been involved in SD-WAN deployment methods; from designing dedicate network appliances for managed service providers, to building NFV-based platform for hosting VNFs from multi-vendors. These uCPE platforms have been adopt by world-leading SD-WAN solution vendors, from traditional WAN optimization companies, communication service provider, to software start-ups and cloud-based services.

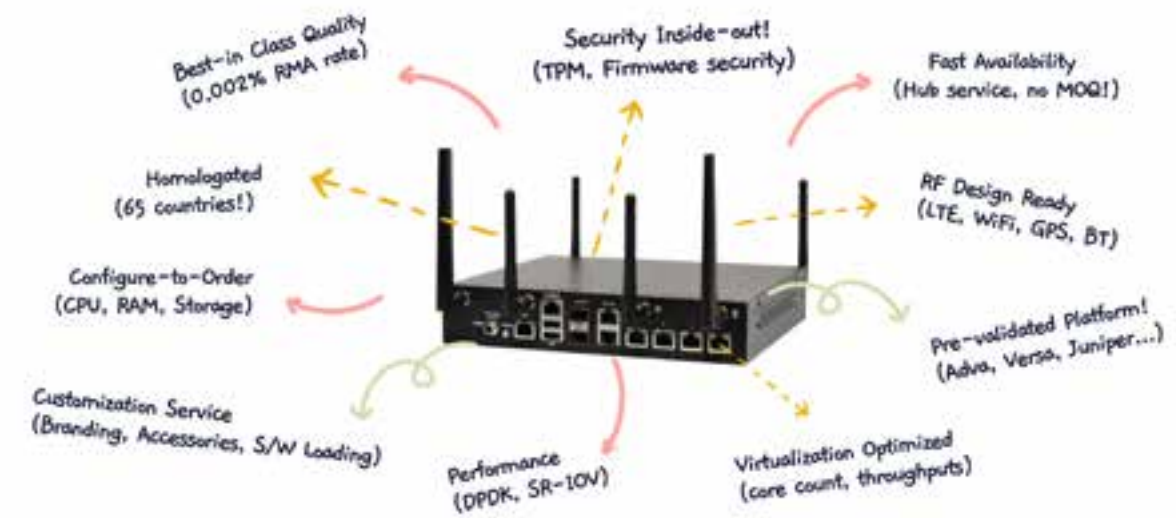


Whitebox Solutions

By leveraging our expertise in network security and IT edge computing, Lanner Whitebox Solutions™ provide a true white box networking platforms that meet most of the specifications that customers are looking for, as well as WiFi and LTE certifications that enable them to be used globally.

Whitebox Solutions™ provide performance-enhanced, desktop/rackmount appliances powered by the latest generation of high core-count x86 processors. Boosted by the packet delivery and virtualization technologies, our white box appliances deliver significant throughput enhancement when running multiple compute-intensive VNFs in SDN/NFV infrastructure.

PRE-ZERO-DAY READY UCPE PLATFORMS



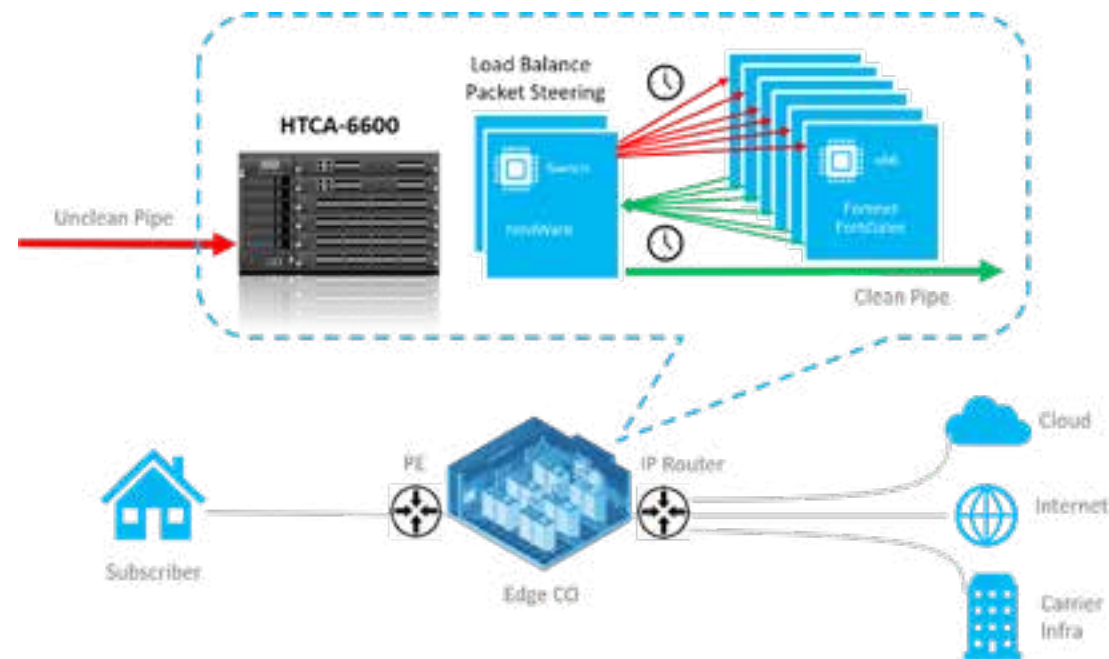
Pre-Validated Solutions for Time-to-Market Deployment

Network disaggregation promises the liberation from proprietary hardware and emphasizes on white-box gateway. Pre-validated and optimized with leading SD-WAN VNF vendors, Lanner whitebox solutions are designed to accelerate time-to-market deployment for communication service providers.



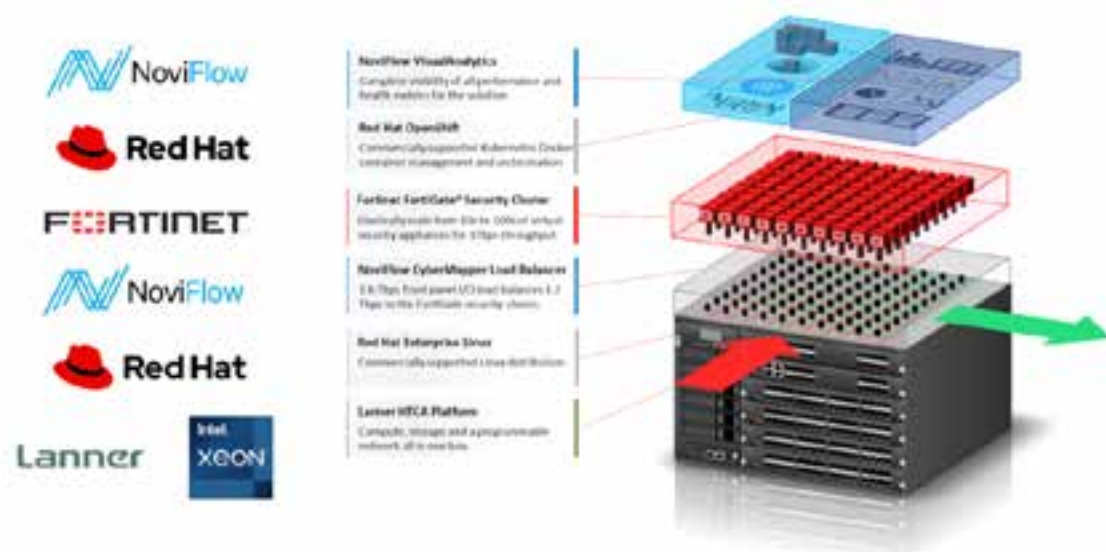
Multi-Access Edge Computing (MEC)

MEC refers to the ability to perform critical core network functions, covering the compute, storage and analytics, at the network edge so that latency is substantially reduced when traffic can be routed to the edge first instead of to the cloud directly. Under this infrastructure, the orchestration aggregates the compute and storage resources, along with networking capability to run user applications at the edge, within proximity to where requests and traffics are generated.



Use case: Programmable Network Platform Empowers Scalable Firewall

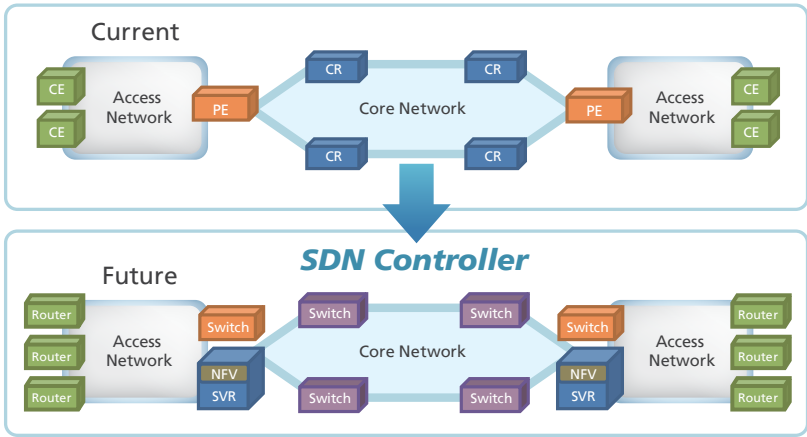
Lanner collaborated with NoviFlow to deliver a scalable firewall solution. The integrated multivendor solution leverages modular hardware and software to provide 145 Gbps to 1 Tbps of scale-out Firewall service with unmatched remote configuration and monitoring, while delivering significant reductions in capital and operating costs, footprint and power consumption.



vRouter

The edge computing and intelligent gateway architecture require the capabilities to tremendous volume of traffic for real-time pre-processing, data analytics, policy control, communication and messaging to connect, collect and manage network programmability.

With the rollout of the CORD network infrastructure, the Virtual Router requires to Perform L3 unicast routing to and from the Central Office and participate in dynamic routing protocols, multicast signaling and forwarding, apply Quality of Service (QoS) policies and support and apply NAT functionalities.



NCA-4020

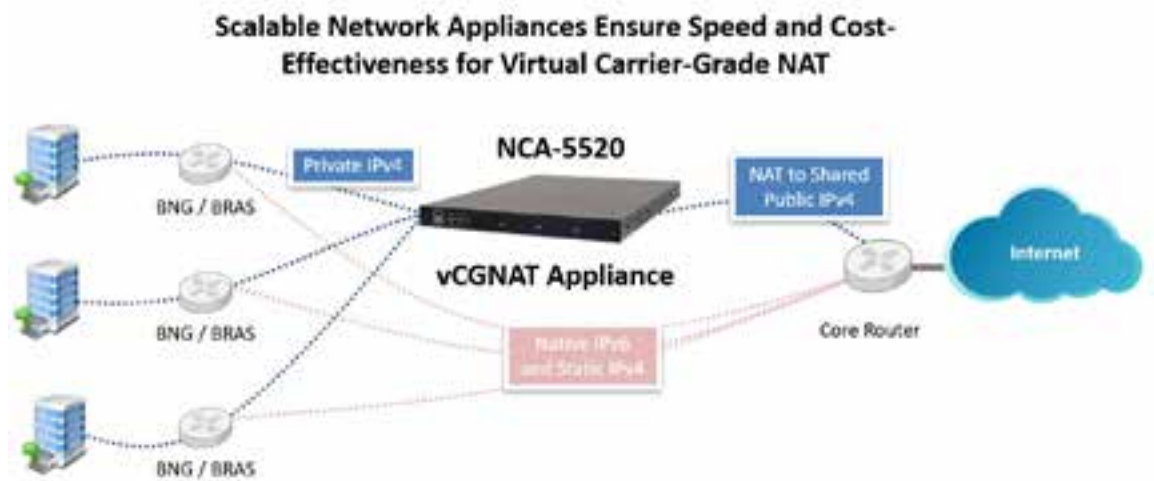
Edge Router Function:

- 1G, 10G and 100G I/F, 100G to 1T switching
- IPv4/IPv6 Routing, ECMP, Multicast, NAT
- MPLS LER (3 labels, IP-VPN, VPWS, VPLS, FRR)
- High performance QoS and OAM
- Other service functions (Firewall, IPS/IDS, DPI, etc.)

vBNG / vCGNAT

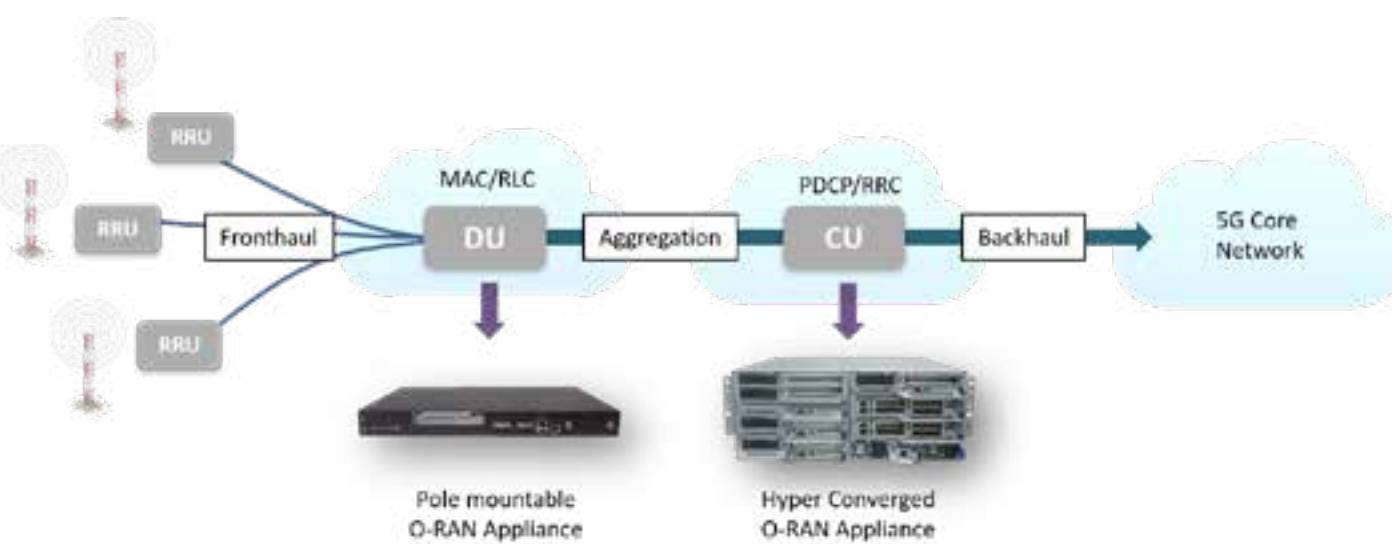
Rapidly increasing subscriber IP traffic is putting pressure on telecom operators and service providers to upgrade their network and keep up with demand. There is a growing shift within operators to disaggregate certain legacy hardware infrastructure in favor of a more agile software defined architecture. One typical scenario would be replacing a fat central edge router (running BNG) with next gen distributed access devices utilizing NFV to optimize their last mile networks. This includes deploying software based vBNG that will be sited closer to the access devices.

Lanner hardware platforms have been successfully tested and deployed as a vBNG delivering significant performance improvements, shorter service delivery timescales and a scalable future-proof solution. Our extensive range of hardware platforms designed for NFV applications are aimed at delivering lower TCO and maximum flexibility for our partners and customers.



OpenRAN is anticipated as the next revolution for Radio Access Network (RAN) infrastructure, and considered as an optimal solution to enhance capacity and coverage, while reducing latency caused by escalating growth of data on the 5G network. OpenRAN solutions offer flexibility and scalability through the disaggregation of hardware and software, and the utilization of Commercial-Off-The-Shelf (COTS) hardware.

The rapid growth of Open RAN has enabled numerous innovations in the space of wireless connectivity, driving service and supply chain diversity as the disaggregation of radio access networks facilitates the implementation of open interfaces. With pre-validated Open RAN solutions, Lanner and ecosystem partners are dedicated to accelerating Open RAN deployments to reach the economies of scale.



Network Appliances for Open RAN

Open RAN provides automation, dynamic scalability and assisted with improved radio performance and speed of emerging 5G technology. An open architecture at the edge, through multi-vendor compatibility, enable flexible hardware and software implementations for scalable, cost-effective network deployments. Lanner’s Open RAN appliance meets Communications Service Providers (CSPs) cost and efficiency demands and provide fundamental high-performance expectations for 5G network.



ECA-4025

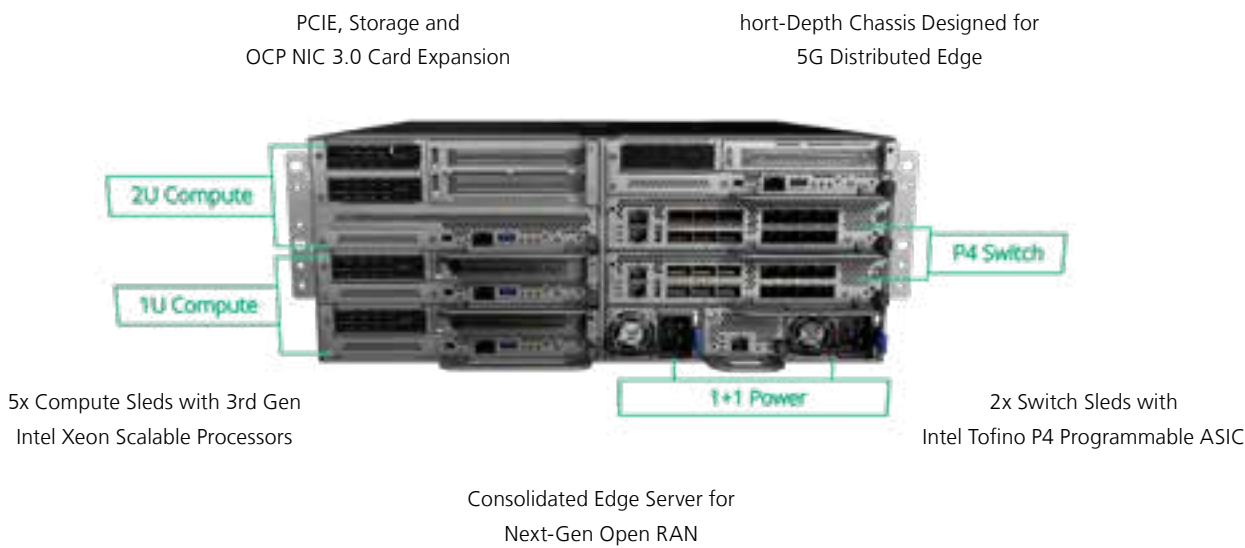
- Intel® Xeon D-2100
- Short Depth Chassis
- Wide Temperature



HTCA-E400





- Carrier-grade, full redundancy and high performance
- Support 5x1U compute sleds or 2x2U compute sleds
- Support 2x 1U switch sleds for redundancy
- 450mm Short Chassis for Edge Deployment

Powered by 5x Intel Xeon Scalable Processors, Lanner HTCA-E400 is a consolidated hyper-converged edge server specifically designed for OpenRAN infrastructure. With support of Intel Tofino P4 and FPGA/ GPU acceleration, the scalable HTCA-E400 edge compute platform features programmable, intelligent switching capability that can offload open architecture CPU and is cost-effective in the long term through supporting protocol-independent and multi-Tbps networking performance without being compromised by hardware bottleneck.



Compute and Switch Sleds

Lanner HTCA-E400 compatible and swappable sleds lineup provide enhanced redundancy, interoperability, flexibility, bandwidth and performance boosts.

Blades	Picture	Features/Ports	Chipset
HTCA-E400		HybridTCA™ 4U telecom network appliance chassis	Intel Ice Lake
HMB-E100		1U Compute sled for HTCA-E400	Intel Ice Lake
HMB-E200		2U Compute sled for HTCA-E400	Intel Ice Lake
HLM-E110		1U Switch sled for HTCA-E400 Fabric interface with 6x 100GbE QSFP28, 8x 10/25GbE SFP+ Optional IEEE 1588	Intel Tofino Series

The Compute, I/O blades or NIC modules shown in this material are not designed to operate independently without a compatible Lanner appliance. Please make sure a compatible Lanner appliance is in place before purchasing the modules.

Desktop Network Appliances



Feature		Description		NCA-1040	NCA-1513	NCA-1510
Form Factor				Desktop	Desktop	Fanless Desktop
Platform	Processor Options			Intel® Atom X6413E/N6415 (Elkhart Lake)	Intel® Atom® C3000 (Denverton), 2~4C	Intel® Atom™ C3000 (Denverton), 2~8C
	CPU Socket			onboard	onboard	onboard
	Chipset			SoC	SoC	SoC
	Security Acceleration			N/A	Intel® QuickAssist Technology (by SKU)	Intel QuickAssist Technology
BIOS				AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology			DDR4 3200 MHz SODIMM	DDR4 2133/1866 MHz ECC/Non-ECC SOD-IMM (By SKU)	DDR4 2133 MHz ECC/Non-ECC DIMM
	Max. Capacity			32 GB	32 GB	32 GB
	Socket			1 x 260-pin SODIMM	1 x 260-pin SODIMM	1 x 260-pin SODIMM
Networking	Ethernet Ports			4 x GbE RJ45 Intel® i210 or i211 Optional 1x PoE+ port	4 x GbE RJ45 Intel® SoC Integrated MAC 2 x GbE RJ45 Intel® i210AT or i211AT (by SKU) 2x GbE SFP Intel® i210-IS(by SKU)	4 x GbE RJ45 Intel® SoC Integrated MAC 2 x GbE RJ45 or SFP Intel® i210 (By SKU)
	Bypass			N/A	2 pair Gen3 (By SKU)	1 pair Gen3 (By SKU)
	NIC Module Slot			N/A	N/A	N/A
LOM	I/O Interface			N/A	N/A	N/A
	OPMA Slot			N/A	N/A	N/A
I/O Interface	Reset Button			1	1	1
	LED			Power/Status/Storage	Power/Status/Storage	Power/Status/Storage
	Power Button			1	1	1
	Console			1 x RJ-45	1 x RJ-45	1 x Mini USB
	USB			1 x USB 3.0	2 x USB 2.0 or 2 x USB 3.0 (by SKU)	2 x USB 2.0
	LCD Module			N/A	N/A	N/A
	Display			Yes (Without Audio)	N/A	N/A
Storage	Power Input			1 x DC Jack With Lock	1 x DC Jack	1 x DC Jack
	HDD/SSD Support			N/A	1 x 2.5" Bay (Optional)	1 x 2.5" Bay (Optional)
	Onboard Storage			1 x M.2 (SATA) 2280 B Key 1 x SATA Connector (Reserved)	1 x EMMC 8GB	1 x EMMC 8GB
Expansion	PCIe			N/A	N/A	N/A
	mini-PCIe			1 x Mini-PCIe (PCIe/USB2.0) 1 x M.2 (PCIe/USB 3.0) 2x Nano SIM	1 x Mini-PCIe (PCIe/USB2.0), 1 x M.2 2280/2242 (SATA3.0), 1x M.2 3042 (USB3.0), 1 x Nano SIM for M.2	1 x Mini-PCIe (PCIe) 1 x M.2 (USB2.0/PCIe) 1 x Nano SIM
Miscellaneous	Watchdog			Yes	Yes	Yes
	Internal RTC with Li Battery			Yes	Yes	Yes
	TPM			N/A	Yes	Yes
Cooling	Processor			Passive CPU heatsink	Passisve CPU heatsink	Passive CPU heatsink
	System			Fanless	1 x Cooling Fan w/ Smart Fan	Fanless
Environmental Parameters	Temperature			0~40°C Operating -40~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating	0~50°C Operating (SKU A/B/C) 0~40°C Operating (SKU D) -20~70°C Non-Operating
	Humidity (RH)			5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating
System Dimensions	(WxHxD)			183 x 32 x 168 mm	231 x 44 x 200 mm	231 x 44 x 200 mm
	Weight			0.9 kg	1.2 kg	1.2 kg
Package Dimensions	(WxHxD)			180 x 32 x 168 mm	358 x 135 x 290 mm	325 x 305 x 120 mm
	Weight			0.9 kg	2.75 kg	2.2 kg
Power	Type / Watts			60W Power Adapter	40W Power Adapter	36W or 60W Power Adapter (By SKU)
	Input			AC 100~240V @50~60Hz, 12V/5A	AC 100~240V @50~60Hz, 1.7A	AC 100~240V @50~60 Hz
Approvals and Compliance				RoHS, CE/FCC Class B, UL, VCCI, UKCA	RoHS, CE/FCC Class B, UL	RoHS, CE/FCC Class B, UL



NCA-1515		NCA-1516		NCR-1510		ISD-O370	
Desktop		Desktop		Fanless Desktop		Fanless Desktop	
Intel® Atom® C3000 (Denverton), 2~16C		Intel® Atom® C3000 (Denverton), 4~16C		Intel® Atom™ C3308/C3508/C3708 (Denverton)		Intel® Atom™ C3708/C3808 (Denverton)	
onboard		onboard		onboard		onboard	
SoC		SoC		SoC		SoC	
Intel QuickAssist Technology		Intel QuickAssist Technology		Intel® QuickAssist Technology		Intel® QuickAssist Technology	
AMI SPI Flash BIOS		AMI SPI Flash BIOS		AMI SPI Flash BIOS		AMI SPI Flash BIOS	
DDR4 2400/2133/1866 MHz ECC/Non-ECC SODIMM (By SKU)		DDR4 2400/2133/1866 MHz ECC/Non-ECC SODIMM (By SKU)		DDR4 2400MHz ECC/Non-ECC		DDR4 up to 2133 MT/s ECC SODIMM	
64 GB		64 GB		16 GB		64 GB, Deafult ECC RAM 16GB x1	
2 x 260-pin SODIMM		2 x 260-pin SODIMM		2 x 260-pin SODIMM (By SKU)		2 x 260-pin SODIMM (By SKU)	
4 x GbE RJ45 Intel® SoC Integrated MAC 2 x GbE RJ45 Intel® i350 and (by SKU) 2 x GbE SFP Intel® i350 (by SKU)		4 x GbE RJ45 Intel® i350 2 x GbE RJ45 Marvell 88E1543 2 x SFP+ SoC Integrated MAC Optional 2x PoE+ ports		6 x GbE RJ45 or 4 x RJ45 & 2 x GbE SFP (By SKU)		All Ethernet ports are supported with SR-IOV, 4x GbE LAN, 2x GbE POE+ by M12 X-coded 8pin Female connector with isolation 1.5KVDC	
1 pair Gen3 (By SKU)		N/A		1 pair Gen3		N/A	
N/A		N/A		N/A		N/A	
1 x RJ45 (By SKU)		N/A		N/A		N/A	
Yes		N/A		N/A		N/A	
1		1		1		N/A	
Power/Status/Storage		Power/Status/Storage		Power/Status/Storage		N/A	
1		1		1		N/A	
1 x RJ-45		1 x RJ-45		1 x Mini USB		1x RS-232/485	
2 x USB 2.0		2 x USB 3.0		2 x USB 3.0 (By SKU)		1 x USB 2.0 by M12 A-coded 8pin Male connector	
N/A		N/A		N/A		N/A	
N/A		N/A		N/A		N/A	
1 x DC Jack		2 x DC Jack (Optional 2nd DC Jack)		1 x DC Jack		1 x DC Jack, Up to 130W	
1 x 2.5" Bay (Optional)		N/A		1 x 2.5" Bay (Optional)		1x M.2 2242 B key	
1 x EMMC 8GB		1 x EMMC 8GB (By Request)		1 x M.2 2242, 1 x SATA III		On-board eMMC 64GB TLC	
N/A		N/A		N/A		N/A	
2 x Mini-PCIe (PCIe/USB2.0) 1 x M.2 2242 B Key (USB3.0) 2 x Nano SIM for M.2		1 x Mini-PCIe (PCIe/USB2.0) 1x M.2 3052/3580 B Key (PCIe/USB 3.0) 1x M.2 3042 B Key (USB 3.0) 1x M.2 2242 B Key (SATA) 2 x Nano SIM		1 x Mini-PCIe (PCIe/USB2.0)		1x M.2 2242 B key	
Yes		Yes		Yes		Yes	
Yes		Yes		Yes		Yes	
Yes		Yes		Yes		Yes	
Passive CPU Heatsink		Passive CPU Heatsink		Passive CPU heatsink		Passive CPU heatsink	
1 x Cooling Fan w/ Smart Fan		2 x Cooling Fans w/ Smart Fan		Fanless		Fanless	
0~40°C Operating -20~70°C Non-Operating		0~40°C Operating -20~70°C Non-Operating		-40~70°C Operating (SKU A/B) -40~60°C Operating (SKU C) -40~85°C Non-Operating		-40~70°C Operating (SKU D & F) -40~60°C Operating (SKU C & E) -40~85°C Ambient storage	
5~90% Operating 5~95% Non-Operating		5~90% Operating 5~95% Non-Operating		5~90% Operating 5~95%, Non-Operating		5~90% Operating 5~95%, Non-Operating	
231 x 44 x 200 mm		231 x 44 x 200 mm		310 x 44 x 240 mm		370 x 210 x 83 mm	
1.2 kg		1.2 kg		TBD		4.6 kg	
358 x 290 x 135 mm		358 x 290 x 135 mm		TBD		450 x 324 x 195 mm	
2.75 kg		2.75 kg		TBD		TBD	
36W or 60W Power Adapter (By SKU)		60W Power Adapter		60W Power Adapter		DC-IN, Up to 130W	
AC 100~240V @50~60 Hz		AC 100~240V @50~60 Hz		9~54 VDC		Rated 24-36Vdc (range 9-50Vdc), supports with reverse protection by M12 K-coded	
RoHS, CE/FCC Class A, UL		RoHS, CE/FCC Class B, UL		RoHS, CE/FCC Class A		CE/FCC class A, UL 62368-1, CB, IP67, MIL-STD-810G	

Rackmount Network Appliances



Feature		Description		NCA-2510	NCA-2513	NCA-4025
Form Factor				1U 19" Rackmount	1U 19" Rackmount	1U 19" Rackmount
Platform	Processor Options			Intel® Atom™ C3000, 8~16 Cores (Denverton)	Intel® Atom™ C3000 2~8 Cores (Denverton-R)	Intel® Xeon® D2100 8/12/16 Cores
	CPU Socket			onboard	onboard	1 x FCBGA2518
	Chipset			SoC	SoC	N/A
	Security Acceleration			Intel® QuickAssist Technology	Intel® QuickAssist Technology	Intel® QuickAssist Technology (By SKU)
BIOS				AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology			DDR4 2400MHz ECC or non-ECC UDIMM	DDR4 2400MHz ECC or non-ECC UDIMM/ RDIMM	DDR4 2666MHz REG DIMM
	Max. Capacity			32GB	64GB	512GB
	Socket			4 x 288pin DIMM	2x 288-pin DIMM	4 x 288-pin DIMM
Networking	Ethernet Ports			1 x GbE RJ45 Intel® i210 4 x GbE RJ-45 Intel® i350-AM4 4 SFP+ Intel® Denverton Integrated (By SKU)	2 x GbE RJ45 Intel® i210 2 x GbE RJ45 Intel® i350-AM2 (By SKU) 4 x GbE RJ45 Intel® SoC Integrated MAC	8 x GbE RJ45 Intel® i350-AM4 4 x SFP+ Intel® SoC Integrated MAC
	Bypass			2 pairs Gen3 (By SKU)	2 pairs Gen3 (By SKU)	N/A
	NIC Module Slot			1	1	2
LOM	I/O Interface			1 x RJ45 (By SKU)	N/A	1 x LOM for IPMI (Optional)
	OPMA Slot			Yes (By SKU)	N/A	N/A
I/O Interface	Reset Button			1	1	1
	LED			Power/Status/Storage	Power/Status/Storage	Power/Status/Storage
	Power Button			1 x ATX Power switch	1 x ATX Power switch	1 x ATX Power switch
	Console			1 x RJ45	1 x RJ45	1 x RJ45
	USB			2 x USB 3.0	2 x USB 3.0 or 2.0 (By SKU)	2 x USB 2.0
	LCD Module			2x20 character LCM 4 x keypads	2x20 character LCM 4 x keypads	N/A
	Display			From OPMA slot (Optional)	N/A	N/A
Storage	Power Input			AC power inlet on PSU	AC Power Inlet on PSU	AC Power Inlet on PSU
	HDD/SSD Support			2 x 2.5" bays	2 x 2.5" bays	2 x 2.5" Internal
Expansion	Onboard Storage			1 x mSATA	1 x M.2	1 x M.2
	PCIe			1 x PCI-E*8 HH/HL (Optional)	1 x PCI-E*8 or *4 FH/HL (By SKU)	N/A
Miscellaneous	mini-PCIe			N/A	Yes (By SKU)	N/A
	Watchdog			Yes	Yes	Yes
Cooling	Internal RTC w/ Li Battery			Yes	Yes	Yes
	TPM			Yes (optional)	Yes	Yes (optional)
Environmental Parameters	Processor			Passive CPU heatsink	Passive CPU Heatsink	Passive CPU heatsink
	System			2 x cooling fans with smart fan	1 x Cooling Fan	4 x Swappable Smart Fans
System Dimensions	Temperature			0~40°C Operating -20~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating
	Humidity (RH)			5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating
Package Dimensions	(WxDxH)			438 x 321 x 44 mm	438 x 321 x 44 mm	438 x 510 x 44 mm
	Weight			4.4 kg	4.4 kg	8.6 kg
Power	(WxDxH)			540 x 500 x 230 mm	540 x 500 x 230 mm	739 x 582 x 215 mm
	Weight			8 kg	8 kg	15 kg
Approvals and Compliance	Type / Watts			220W ATX Single PSU	150W ATX Single PSU	450W 1+1 Redundant PSU
	Input			AC 90~264V @47~63Hz	AC 90V~264V @47~63Hz	AC 110~240V @47~63 Hz



NCA-4020		NCA-4220		NCA-5220	
1U 19" Rackmount		1U 19" Rackmount		1U 19" Rackmount	
Intel® Xeon® D2100 4~16 Cores (Skylake-DE)		Intel® Core™ i7/i5/i3 or Pentium® or Celeron® (Coffee Lake)		Intel® Xeon® E or Core i3 or Pentium or Celeron Processor (Coffee Lake), Up to 6 Cores	
1 x FCBGA2518		1 x LGA1151		1 x LGA1151	
N/A		Intel® H310/Q370/C246		Intel® C246	
Intel® QuickAssist Technology (By SKU)		N/A		N/A	
AMI SPI Flash BIOS		AMI SPI Flash BIOS		AMI SPI Flash BIOS	
DDR4 2666MHz REG DIMM		DDR4 2666MHz ECC(By CPU for C246 only) or Non-ECC UDIMM		DDR4 2666 MHz ECC (By CPU) or Non-ECC UDIMM	
128GB		32GB		128GB (32GB per DIMM)	
4 x 288-pin DIMM		2 x 288pin DIMM		4 x 288-pin DIMM	
10 x GbE RJ45 (4 x or 8 x PoE+, By SKU) 4 x 10G SFP+		8 x GbE RJ45 Intel® i210		2x GbE RJ45 for Dual MGMT Intel® i210 8x GbE RJ45 Intel® i210(SKU A) 4x GbE RJ45 Intel® i350-AM4 (SKU A) 4x SFP LAN Ports (By Project)	
N/A		up to 3 pairs Gen3 (By SKU)		Up to 5 Pairs of Gen3 Bypass (By SKU)	
N/A		1		2	
1 x RJ45		-		1 x RJ45	
IPMI Onboard		-		Yes	
1		1		1	
Power/Status/Storage		Power/Status/Storage		Power/Status/Storage	
1 x ATX Power switch		1 x ATX Power switch		1 x ATX Power Switch	
1 x RJ45		1 x RJ45		1 x RJ45	
2 x USB 2.0		2 x USB 3.0		2 x USB 3.0	
N/A		2x20 character LCM 4 x keypads		4 x Keypads, 16x2 Character LCD	
Internal Pin Header		HDMI (Optional)		From OPMA Slot (Optional)	
AC Power Inlet on PSU		AC power inlet on PSU		AC Power Inlet on PSU	
2 x 2.5" Internal		2 x 2.5" bays		2 x 2.5" Bays	
2 x M.2 (w/ LTE Support)		1 x M.2		1 x M.2 2242, B+M Key (Optional)	
1 x PCI-E*8 FH/HL (Optional)		1 x PCI-E*8 (Default), 2 x PCI-E*4 (Optional)		2 x PCIe*4 FH/HL (Optional)	
1 x Mini-PCIe (PCIe*1/USB2.0)		1 x Mini-PCIe		N/A	
Yes		Yes		Yes	
Yes		Yes		Yes	
Yes (optional)		Yes (optional)		Yes (Optional)	
Passive CPU heatsink		Passive CPU heatsink		Passive CPU Heatsink	
3 x cooling fans with smart fan		2 x cooling fans with smart fan		2 x Cooling Fans with Smart Fan	
0~40°C Operating -40~70°C Non-Operating		0~40°C Operating -20~70°C Non-Operating		0~40°C Operating -20~70°C Non-Operating	
5~90% Operating 5~95% Non-Operating		5~90% Operating 5~95% Non-Operating		5~90% Operating 5~95% Non-Operating	
438 x 468 x 44 mm		438 x 321 x 44 mm		438mm x 500mm x 44mm	
7.9 kg		7.5 kg		7.1kg	
739 x 582 x 215 mm		540 x 500 x 230 mm		739mm x 582mm x 215mm	
13.6 kg		8.5 kg		13kg	
600W 1+1 ATX Redundant PSUs		220W ATX Single PSU		300W 1+1 ATX Redundant PSUs	
AC 100~240V @47~63Hz		AC 90~264V @47~63 Hz		AC 90V~264V @47~63Hz	
RoHS, CE/FCC Class A, UL		RoHS, CE/FCC Class A, UL		RoHS, CE/FCC Class A, UL	

Rackmount Network Appliances



Feature		Description	NCA-5230	NCA-5520	NCA-5530
Form Factor			1U 19" Rackmount	1U 19" Rackmount	1U 19" Rackmount
Platform	Processor Options	Intel® Xeon® i9/i7/i5/i3 Processors (Comet Lake-S)	Intel® Xeon® Scalable CPUs (Skylake-SP & Cascade Lake-SP)	3rd Gen Intel® Xeon® Scalable CPU (Ice Lake SP)	
	CPU Socket	1 x LGA1200	1 x LGA3647	1 x LGA4189	
	Chipset	Intel® W480E	Intel® C621/626	Intel® C621A/C627A	
	Security Acceleration	N/A	Intel® QuickAssist Technology (By SKU)	Intel® QuickAssist Technology (By SKU)	
BIOS			AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology	DDR4 2933 MHz ECC or Non-ECC UDIMM	DDR4 2666MHz REG DIMM	DDR4 3200MHz REG DIMM	
	Max. Capacity	128GB	384GB	512GB	
	Socket	4 x 288-pin DIMM	12 x 288pin DIMM	8 x 288pin DIMM	
Networking	Ethernet Ports	8x GbE RJ45 8x SFP	4 x GbE RJ45 or 4 x 10G SFP+ Lewisburg Internal MAC	1 x GbE RJ45 Intel i210	
	Bypass	4 Pairs (For RJ45 Copper Only)	Depends on NIC Module Specifications	Depends on NIC Module Specifications	
	NIC Module Slot	2	4	4 or 2	
LOM	I/O Interface	Optional	1 x RJ45 (Optional)	1 x RJ45 (Optional) *Share with ETH0	
	OPMA Slot	Yes	N/A, IPMI Chip Onboard	Yes	
I/O Interface	Reset Button	1	1	1	
	LED	Power/Status/Storage	Power/Status/Storage	Power/Status/Storage	
	Power Button	1 x ATX Power Switch	1 x ATX Power switch	1 x ATX Power switch	
	Console	1 x RJ45	1 x RJ45, 1 x Mini USB	1 x RJ45	
	USB	2 x USB 3.0	2 x USB 3.0	2 x USB 3.0	
	LCD Module	4 x Keypads, 16x2 Character LCD	N/A (Optional)	N/A (Optional)	
	Display	Optional	Internal Pin Header	1 x VGA, From OPMA Slot (Optional)	
	Power Input	AC Power Inlet on PSU	AC power inlet on PSU	AC power inlet on PSU	
Storage	HDD/SSD Support	2 x 2.5" Bays	2 x 2.5" Internal	2 x 2.5" Internal	
	Onboard Storage	1 x M.2 (SATA) 2242/2280 B+M key	1 x mSATA	1 x M.2-2280 (SATA)	
Expansion	PCIe	1 x PCI-E*8 FH/HL (Optional)	1 x PCI-E*16 FH/HL (Optional)	N/A (Default); 1x PCI-E*16 FH/HL (By Project)	
	mini-PCIe / NVME	N/A	N/A	N/A	
Miscellaneous	Watchdog	Yes	Yes	Yes	
	Internal RTC with Li Battery	Yes	Yes	Yes	
	TPM	Yes	Yes (Optional)	Yes (Optional TPM2.0)	
Cooling	Processor	Passive CPU Heatsink	Passive CPU heatsink	Passive CPU heatsink	
	System	4 x Cooling Fans with Smart Fan	4 x Individual Hot-swappable Cooling Fans w/ Smart Fan	5 x Or 4 x Individual Hot-swappable Cooling Fans w/ Smart Fan (By SKU)	
Environmental Parameters	Temperature	0~40°C Operating -40~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating	
	Humidity (RH)	5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating	
System Dimensions	(WxDxH)	438 x 468 x 44 mm	438 x 650 x 43.5 mm	438 x 610 x 44mm	
	Weight	7.6 kg	16.5 kg	10.5kg	
Package Dimensions	(WxDxH)	739 x 582 x 215 mm	790 x 600 x 220 mm	739 x 215 x 582mm	
	Weight	15.8 kg	18 kg	18.5kg	
Power	Type / Watts	350W 1+1 ATX Redundant PSUs	TBD	550W 1+1 ATX Redundant PSUs	
	Input	TBD	AC 100~240V @47~63Hz	AC 100~240V @47~63Hz	
Approvals and Compliance			RoHS, CE/FCC Class A, UKCA, UL	TBD	RoHS, CE, FCC Class A, UL



NCA-5710		NCA-6210		NCA-6520	
1U 19" Rackmount		2U 19" Rackmount		2U 19" Rackmount	
Intel® Xeon® Processor Scalable Family (Skylake-SP/Cascade Lake-SP)		Intel® Xeon® Scalable CPUs (Skylake-SP & Cascade Lake-SP)		3rd Gen Intel® Xeon® Scalable CPU (Ice Lake SP)	
2 x LGA3647		2 x LGA3647		2 x LGA4189	
Intel® C621/627		Intel® C621/627		Intel® C627A	
Intel® QuickAssist Technology (By SKU)		Intel® QuickAssist Technology (By SKU)		Intel® QuickAssist Technology	
AMI SPI Flash BIOS		AMI SPI Flash BIOS		AMI SPI Flash BIOS	
DDR4 2666MHz REG DIMM		DDR4 2666MHz REG DIMM		DDR4 3200 MHz R-DIMM	
384GB		640GB		1536GB	
12 x 288pin DIMM		20 x 288pin DIMM		24 x 288-pin DIMM	
4 x 10G SFP+ Lewisburg Internal MAC		1 or 2 x GbE RJ45 Intel® i210 (By SKU) 2 x 10G SFP+ Lewisburg Internal MAC (By SKU)		2 x GbE RJ45 Intel® i350-AM2	
Depends on NIC Module Specifications		Depends on NIC Module Specifications		Depends on NIC Module Specifications	
4		8		8	
1 x RJ45 (Optional) *Share with ETH0		1 x RJ45 (By SKU)		1 x RJ45	
IPMI Chip Onboard (SKU B & C)		IPMI Onboard (SKU C & D)		IPMI Onboard	
1		1		1	
Power/Status/Storage		Power/Status/Storage		Power/Status/Storage	
1 x ATX Power switch		1 x ATX Power switch		1 x ATX Power switch	
1 x RJ45, 1 x Mini USB		1 x RJ45, 1 x Mini USB (By SKU)		1 x RJ45	
2 x USB 3.0		2 x USB 3.0		2 x USB 3.0	
N/A (Optional)		N/A (Optional)		N/A (Optional)	
Internal Pin Header		1 x VGA (Optional)		1 x VGA (Internal Pin Header)	
AC power inlet on PSU		AC power inlet on PSU		AC power inlet on PSU	
2 x 2.5" Internal		2 x 3.5" Swappable (with Support for 2 x 2.5")		2x 3.5" or 2.5" Swappable	
1 x M.2		1 x mSATA (M.2 By Project)		2x M.2 (NVME); 1x M.2 (SATA)	
1 x PCI-E*16 FH/HL (Optional)		1 x PCI-E*16 FH/HL (Optional)		SKU A: (Default) N/A 1x PCIe x16 HH/FL & 1x PCIe x16 HH/HL (Optional) SKU B: (Default) N/A 2x PCIe x16 FH/FL (Optional)	
N/A		N/A		N/A	
Yes		Yes		Yes	
Yes		Yes		Yes	
Yes (Optional)		Yes (Optional)		TPM2.0 (Optional)	
Passive CPU heatsink		Passive CPU heatsink		Passive CPU heatsink	
6 x Individual Hot-swappable cooling fans with smart fan		4 x Individual Hot-swappable cooling fan with smart fan		4 x Individual Hot-swappable cooling fan with smart fan	
0~40°C Operating -20~70°C Non-Operating		0~40°C Operating -20~70°C Non-Operating		0~40°C Operating -20~70°C Non-Operating	
5~90% Operating 5~95% Non-Operating		5~90% Operating 5~95% Non-Operating		5~90% Operating 5~95% Non-Operating	
438 x 650 x 44 mm		438 x 600 x 88 mm		438 x 720 x 88mm	
12 kg		24 kg		19.3kg	
841 x 588 x 215 mm		935 x 588 x 258 mm		588 x 997 x 250mm	
19 kg		26 kg		32 kg	
850W 1+1 ATX Redundant PSUs		850W 1+1 ATX Redundant PSUs		850W 1+1 ATX Redundant PSUs	
AC 100~240V @47~63Hz		AC 100~240V @47~63Hz AC 90~264V @47~63Hz		AC 100~240V @47~63Hz	
RoHS, CE/FCC Class A, UL		RoHS/RoHS, CE, FCC Class A, UL		RoHS/RoHS, CE, FCC Class A, UL	

Rackmount Network Appliances



Feature		Description	NCA-6110	NCA-5310	NCA-4112
Form Factor			2U 19" Rackmount	1U 19" Rackmount	1U 19" Rackmount
Platform	Processor Options		AMD EPYC™ 7000 Series (Up to 32C64T)	AMD 3rd Gen EPYC™ Processor Family (Codenamed Milan)	AMD EPYC™ 3000 Series (4~8 Cores)
	CPU Socket		2 x SP3r1	SP3	SP4r2
	Chipset		N/A	N/A	SoC
	Security Acceleration		40Gbps Encryption + 40Gbps Decryption	40Gbps Encryption + 40Gbps Decryption	10Gbps Encryption + 10Gbps Decryption
BIOS			AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology		DDR4 2666MHz ECC REG DIMM	DDR4 3200MHz ECC REG DIMM	DDR4 2666 MHz ECC/U/R DIMM
	Max. Capacity		512GB	512GB	128GB
	Socket		16 x 288-pin DIMM	8 x 288-pin DIMM	4 x 288-pin DIMM
Networking	Ethernet Ports		2 x GbE RJ45 Intel® i210	1 x GbE RJ45 Intel® i210	8 x GbE RJ45 Intel® i350-AM4 2 x 10G SFP+ (By SKU)
	Bypass		N/A	N/A	3 x Pairs of Gen3
	NIC Module Slot		4	4	1 (for 1 x PCIe*8 or 2 x PCIe*4)
LOM	I/O Interface		1 x RJ45 (By SKU)	1 x RJ45	1 x RJ45 *Share with ETH0
	OPMA Slot		Yes	Yes	Yes
I/O Interface	Reset Button		1	1	1
	LED		Power/Status/Storage	Power/Status/Storage	Power/Status/Storage
	Power Button		1 x ATX Power Switch	1 x ATX Power Switch	1 x ATX Power Switch
	Console		1 x RJ45	1 x RJ45	1 x RJ45
	USB		2 x USB 2.0	2 x USB 3.0	2 x USB 3.0
	LCD Module		N/A (Optional)	N/A	1 x LCM, 4 x Keypads
	Display		1 x VGA (Optional)	1 x VGA (Optional)	From OPMA Slot for VGA (Optional)
	Power Input		AC Power Inlet on PSU	AC Power Inlet on PSU	AC Power Inlet on PSU
Storage	HDD/SSD Support		4 x 3.5" Swappable Bays	2 x 2.5" Swappable Bays	2 x 2.5" Swappable Bays
	Onboard Storage		1 x mSATA (M.2 By Project)	1 x 22110/2280 M.2 Slot	1 x 2242 M.2
Expansion	PCIe		2x PCIe*8 FH or 1x PCIe*16 FH	1 x PCIe*8 FHHL	N/A
	mini-PCIe / NVME		N/A / Max. 1TB	N/A	1 x Mini-PCIe
Miscellaneous	Watchdog		Yes	Yes	Yes
	Internal RTC with Li Battery		Yes	Yes	Yes
	TPM		Yes (Optional)	Yes (Optional)	TPM 1.2/2.0
Cooling	Processor		Passive CPU Heatsink	Passive CPU Heatsink	Passive CPU Heatsink
	System		4 x Individual Hot-swappable Cooling Fans	5 x Individual Hot-swappable Cooling Fans	2 x Cooling Fans w/ Smart Fan
Environmental Parameters	Temperature		0~40°C Operating -20~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating
	Humidity (RH)		5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating	5~90% Operating 5~95% Non-Operating
System Dimensions	(WxDxH)		438 x 647 x 89 mm	438 x 610 x 44 mm	438 x 431 x 44 mm
	Weight		24 kg	TBA	TBA
Package Dimensions	(WxDxH)		825 x 600 x 270 mm	739 x 582 x 215 mm	582 x 548 x 182 mm
	Weight		26 kg	TBA	TBA
Power	Type / Watts		800W 1+1 ATX Redundant PSUs	550W 1+1 ATX Redundant PSUs	300W Redundant PSUs
	Input		AC 100V~240V @47~63Hz	AC 100V~240V @47~63Hz	100~240VAC @50~60Hz, 5~3A
Approvals and Compliance			RoHS, CE, FCC, UL	RoHS, CE, FCC, UL	RoHS, CE, FCC, UL

Lanner F.A.S.T. Solutions
NIC Modules



Enhance the performance and bandwidth of your network appliances with Lanner’s new swappable network modules. These modules enable higher packet processing for network appliances in applications such as DPI, IPS/IDS and WAN optimization.

Model Name	Ports	Chipset	Bypass
GbE RJ45 Modules			
NCS2-IGM806A	8	i350-AM4	4 Pairs Gen3
GbE SFP Modules			
NCS2-ISM405A	4	i350-AM4	Fiber Bypass
NCS2-ISM802A	8	i350-AM4	N/A
10G RJ45 Modules			
NCS2-ITM401	4	X710-AM2	N/A
10G Fiber Modules			
NCS2-IXM407	4	XL710-AM2	N/A
NCS2-IXM803	8	E810-CAM2	N/A
25G Modules			
NCS2-IVM201	2	XXV710	N/A
NCS2-IXM415	4	E810-CAM2	N/A
40G Modules			
NCS2-IQM201	2	XL710-AM2	N/A
100G Modules			
N2S-IHM203	2	E810-CAM2	N/A
NCS2-IHM204	2	E810-CAM2/1	N/A
N2S-MHM201	2	ConnectX-4	N/A
N2S-MHM202A	2	ConnectX-5	N/A
N2S-MHM203A	2	ConnectX-6	N/A

Processor and Performance

Choose from a wide selection of network modules powered by Intel’s latest CPU/chipset technologies, which include Intel® E810/XL710, Fortville XXV710, FM10420 multi-host Ethernet controller and more.

Wide Compatibility and Scalability

Lanner offers wide compatibility and scalability with our custom modular design. Our modules are certified with endurance and compatibility tests and are compatible with our existing and future network appliances.

Module Customizations

Choose from 20+ Ethernet network modules, including RJ-45, fiber, bypass and transmission rates from 1GbE, 10GbE, 25GbE, 40GbE to even 100GbE. Lanner also has PCI-E expansion modules for data storage, Wi-Fi connectivity, video transcoding and more.

Time to Market

Aiming to accelerate your time-to-market development, Lanner customizes our standard models based on your specific, mission-critical applications.

Connectivity Modules

Lanner offer wide selections of NIC modules that support 1/10/40/100GbE with copper and fiber interface, as well as PoE or TAP ready design.



- 100Gbps NIC Module - NCS2-IHM204/ N2S-MHM202A**
- Intel E810 Series/Mellanox ConnectX®-5 EN Ethernet Controller
 - 2 x 100GbE QSFP28/2x 100GbE Fiber Ports



- 4-port PoE NIC Module - NCS2-POEIG402A / NCS2-POEIG801A (Power over Ethernet) module**
- Intel Ethernet Controller
 - IEEE 802.3af/at Compliant
 - 4/8 x PoE RJ45 Ports, 30W Per Module



- RF Carrier Module - NCS2-M201**
- Support For Wifi/5G Cards Or Lanner PGN-300/600 LTE Modules
 - 1 x Gen3 PCIe*8 Golden Finger
 - Integrated LED On Cage



- RF Carrier Module - NCS2-MINIPCIE02**
- 1 x MPCIE slot (PCIE)
 - 1 x MPCIE slot (PCIE/USB)
 - 1 x m.2 B key (USB)
 - 2 x SIM card readers
 - 4 x Antennas



- Swappable 4G/LTE Radio Modem Module - PGN-600/PGN-300**
- Sierra Wireless EM7511/EM7455
 - CAT-12/ CAT-6
 - AT&T/Verizon Pre-certified
 - 2x SIM, 2x 4G LTE Antenna
 - PTCRB/FirstNet™/CBRS Pre-certified



Video Transcoding Modules

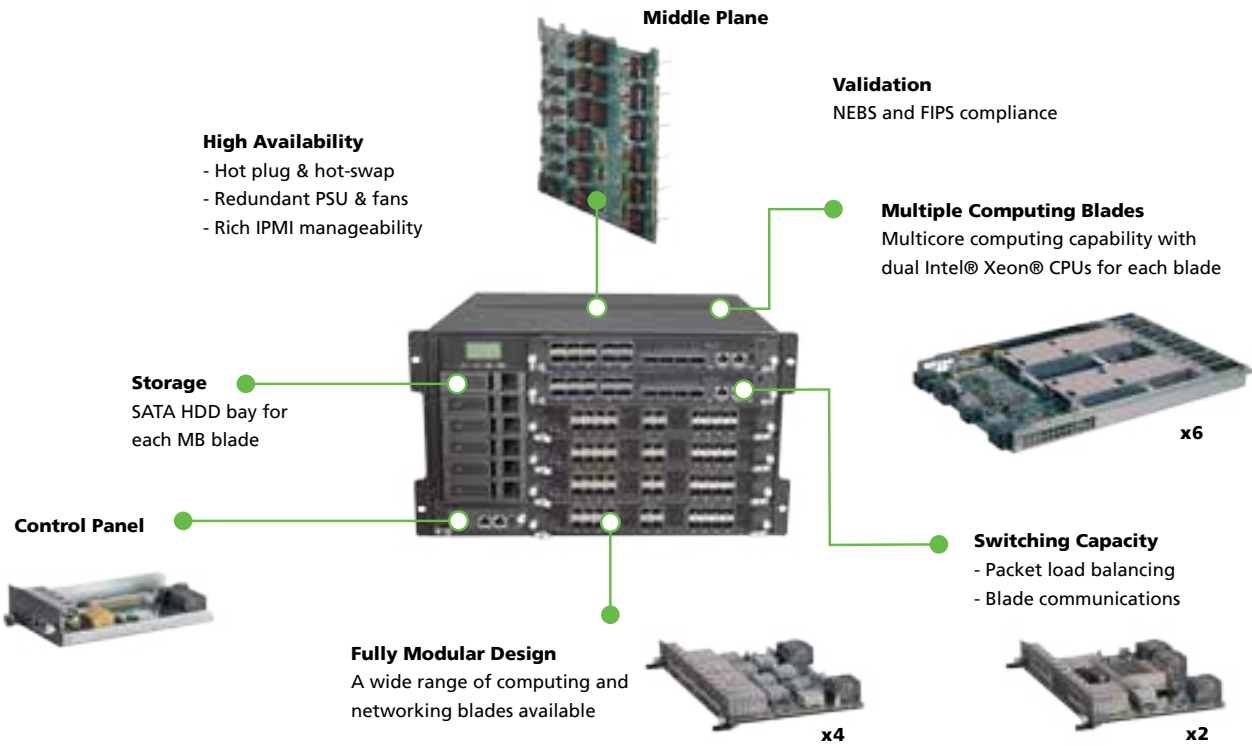
Lanner provides front-facing, easily swappable video transcoding modules that transport high quality streaming and bandwidth-hungry video content.



- Video Transcoding NIC With Intel® Tiger Lake U - NCS2-VT04**
- Video transport NIC module for Lanner network appliances
 - Intel® Tiger Lake U CPU (i7/Celeron)
 - Max. 32GB DDR4 3200 MHz non-ECC UDIMM
 - 10bit HEVC Codec

HybridTCA Architecture

Lanner’s HybridTCA Platforms integrate control, management and data processing in one system and have advantages over the prevalent AdvancedTCA infrastructure in aspects of hardware design, customization options and cost/energy efficiency.



Compute and Networking Blades

Lanner HTCA-compatible and swappable blades lineup provide enhanced redundancy, interoperability, flexibility, bandwidth and performance boosts.

Blades	Picture	Features/Ports	Chipset
HMB-6110		2 x Intel® Xeon® Processor Scalable Family	Intel C621/C627 PCH (by SKU)
HCM-1001		20 port 10GbE SFP+	Intel XL710
HLM-1100		16 port 100GbE QSFP28 + 8 25/10GbE SFP28	Barefoot Tofino Switch
HLM-1101		14x QSFP28 Ports	Barefoot Tofino Switch
HLM-1021		2.0T Bandwidth Fabric Interface Switch 2 x 100G QSFP28, 16x 25G SFP28	Broadcom BCM56873(Trident 3)
HLM-1030		6 100GbE QSFP28 4 40GbE QSFP+ 16 10GbE SFP+	BCM56960 (Tomahawk)

The Compute, I/O blades or NIC modules shown in this material are not designed to operate independently without a compatible Lanner appliance. Please make sure a compatible Lanner appliance is in place before purchasing the modules.

Advanced Network Platforms



Feature		Description	FX-3420	ECA-4025	HTCA-6200
Form Factor			2U 19" Rackmount	1U Rackmount	2U Rackmount
Platform	Processor Options		Intel® Xeon® Processor Scalable Family (Skylake-SP/Cascade Lake-SP up to 205)	Intel® Xeon D-2100 8/12/14/16 Cores Processor	Depends on compute blade specification
	Chipset		Intel C612	N/A	Depends on compute blade specification
OS Support			Linux Kernel 2.6 or above	Linux Kernel 2.6 or above,	Linux Kernel 2.6 or above
System Memory	Technology		DDR4 2933 MHz REG DIMM	DDR4 2666MHz REG DIMM	Depends on compute blade specification
	Max. Capacity		768GB	64 GB	Depends on compute blade specification
	Socket		24x 288-pin DIMM	2 x 288-pin DIMM	Depends on compute blade specification
Storage	HDD Bays		Front: 12x 3.5" HDD SATA 6G /SAS 12G or 12x 2.5" NVME Back: 2 x 2.5" SATA 6G	4 x 2.5" Internal SSD/HDD drive bays	2 x 2.5" Swappable HDD drive bays
	CF/SD		N/A	1 x M.2 NVMe 2280 M key	Depends on compute blade specification
Networking	Ethernet Ports		4 x 10G SFP+ 6 x GbE RJ45	1 x GbE RJ45 and 8 x 10G SFP+	Blade 1~2: Switch Fabric Blade or Ethernet I/O Blade
	Bypass		N/A	N/A	N/A
	Controllers		i350 / XL710	1 x Intel i210	Depends on blade specification (HLM series)
	NIC Module Slot / Blade		N/A	N/A	2 x Blades
	IPMI		IPMI Chip Onboard	1 x onboard IPMI port	1 x onboard IPMI port
	Management Port		N/A	N/A	1 x Management port
I/O Interface	Reset Button		Yes	Yes	Yes
	Console		1 x DB9	1 x RJ-45	1 x RJ-45
	USB		2 x USB 2.0, 2 x USB 3.0	1 x USB 3.0	1 x USB 2.0
Expansion	PCIe		2x PCI-E*16 FH/FL + 1x PCI-E*8 HH/HL M.2 PCI-e SSD	1 x PCI-E*16 FH 3/4L	N/A
	mini-PCIe / NVME		Optional	1x M.2 NVMe 2280 M key	N/A
Cooling	Processor		Passive CPU Heatsink	CPU heatsink with fan duct	CPU heatsink with fan duct
	System		6x individual hot-swappable cooling fans with smart fan	5 x smart fans	5 x hot-swappable cooling fans per M/B
Environmental Parameters	Temperature		0~40°C / -20~70°C	-40~65°C Operating -40~70°C Non-Operating	0 ~ 40°C Operating -20~70°C Non-Operating
	Humidity (RH)		5~90% non condensing / 5~95%, non condensing	5 ~ 90% Operating 5 ~ 95% Non-Operating	5 ~ 90% Operating 5 ~ 95% Non-Operating
Miscellaneous	LCD Module		N/A	N/A	2 x 20 characters
	Watchdog		Yes	Yes	Yes
	Internal RTC with Li Battery		Yes	Yes	Yes
Dimensions	Dimensions (WxHxD)		445 x 88 x 785 mm	438 x 300 x 44 mm	438 x 88 x 685 mm
	Weight		TBD	5 kg	26 kg
Power	Watts / Type		1200W 1+1 Redundant PSU	400W 1+1 Redundant PSU	AC 2000 watt N+1 Redundant /each DC 1600 watt N+1 Redundant /each PM bus support
	Input		AC 100V~240V @47~63Hz	-57 VDC ~ -40VDC dual input feed	AC 85 ~ 264 V DC -36V ~ -72V
Approvals & Compliance			CE/FCC Class A	CE/FCC Class A, UL	CE Class A, FCC Class A, RoHS, NEBS design compliance



Feature		Description	HTCA-E400	HTCA-6400	HTCA-6600
Form Factor			4U Rackmount	4U Rackmount	6U Rackmount
Platform	Processor Options		Intel® Xeon® Processor Scalable Family (Ice Lake-SP)	Depends on compute blade specification	Depends on compute blade specification
	Chipset		Depends on compute blade specification	Depends on compute blade specification	Depends on compute blade specification
	OS Support		Linux Kernel 2.6 or above	Linux Kernel 2.6 or above	Linux Kernel 2.6 or above
System Memory	Technology		Depending on compute sled	Depends on compute blade specification	Depends on compute blade specification
	Max. Capacity		Depending on compute sled	Depends on compute blade specification	Depends on compute blade specification
	Socket		Depending on compute sled	Depends on compute blade specification	Depends on compute blade specification
Storage	HDD Bays		Depending on compute sled	8 x 2.5" Swappable HDD drive bays	6 x 3.5" Swappable HDD drive bays
	CF/SD		Depending on compute sled	Depends on compute blade specification	Depends on compute blade specification
Networking	Switch Sled		Switch Sled	Blade 1~2: Switch Fabric Blade Blade 3~4: Ethernet I/O Blade	Blade 1~2: Switch Fabric Blade Blade 3~6: Ethernet I/O Blade
	N/A		N/A	N/A	N/A
	Broadcom BCM5396		Broadcom BCM5396	Depends on blade specification (HLM series)	Depends on blade specification (HLM series)
	2 x Sled		2 x Sled	4 x Blades	6 x Blades
	1 x onboard IPMI port		1 x onboard IPMI port	1 x onboard IPMI ports	1 x onboard IPMI ports
	1 x Management port		1 x Management port	1 x Management port	1 x Management port
I/O Interface	Reset Button		Yes	Yes	Yes
	Console		1 x RJ-45	1 x RJ-45	1 x RJ-45
	USB		N/A	1 x USB 2.0	1 x USB 2.0
Expansion	PCIe		Depending on compute sled	N/A	N/A
	mini-PCIe / NVME		N/A	N/A	N/A
Cooling	Processor		CPU heatsink with fan duct	CPU heatsink with fan duct	CPU heatsink with fan duct
	System		5 x hot-swappable cooling fans per 1U Compute Sled 2 x hot-swappable cooling fans per 2U Compute Sled	5 x hot-swappable cooling fans per M/B	5 x hot-swappable cooling fans per M/B
Environmental Parameters	Temperature		0 ~ 40°C Operating -20~70°C Non-Operating	0 ~ 40°C Operating -20~70°C Non-Operating	0 ~ 40°C Operating -20~70°C Non-Operating
	Humidity (RH)		5 ~ 90% Operating 5 ~ 95% Non-Operating	5 ~ 90% Operating 5 ~ 95% Non-Operating	5 ~ 90% Operating 5 ~ 95% Non-Operating
Miscellaneous	LCD Module		N/A	2 x 20 characters	2 x 20 characters
	Watchdog		Yes	Yes	Yes
	Internal RTC with Li Battery		Yes	Yes	Yes
Dimensions	Dimensions (WxHxD)		438 x 88 x 685 mm	438 x 177.3 x 685 mm	438 x 265.9 x 685 mm
	Weight		27.5 kg	40 kg	55 kg
Power	Watts / Type		AC 3000W 1+1 Redundant PSU DC 1600W 220V 1+1 Redundant PSU	AC 2000 watt N+1 Redundant /each DC 1600 watt N+1 Redundant /each PM bus support	AC 1200 watt N+1 Redundant /each DC 1010 watt N+1 Redundant /each PM bus support
	Input		DC -36V ~ -72V	AC 85 ~ 264 V DC -36V ~ -72V	AC 85 ~ 264 V DC -36V ~ -72V
Approvals & Compliance			CE Class A, FCC Class A	CE Class A, FCC Class A, RoHS, NEBS design compliance	CE Class A, FCC Class A, RoHS, NEBS design compliance