Lanner

Telecommunication

Scalable Network Platforms for 5G Edge Infrastructure

Unleashing the Power of 5G Edge Computing

The emergence of 5G has ushered in a new era characterized by ultra-low latency, high bandwidth, and extensive device connectivity, unlocking tremendous opportunities for industries worldwide. One of the key drivers behind this transformative technology is the convergence of edge computing and virtualized network infrastructure.

Lanner Edge Servers and Universal Customer Premises Equipment (uCPE) platforms have emerged as crucial elements in the deployment of private 5G networks. These state-of-the-art solutions provide enterprises and service providers with the ability to harness the power of 5G while retaining control, security, and customization over their network infrastructure.
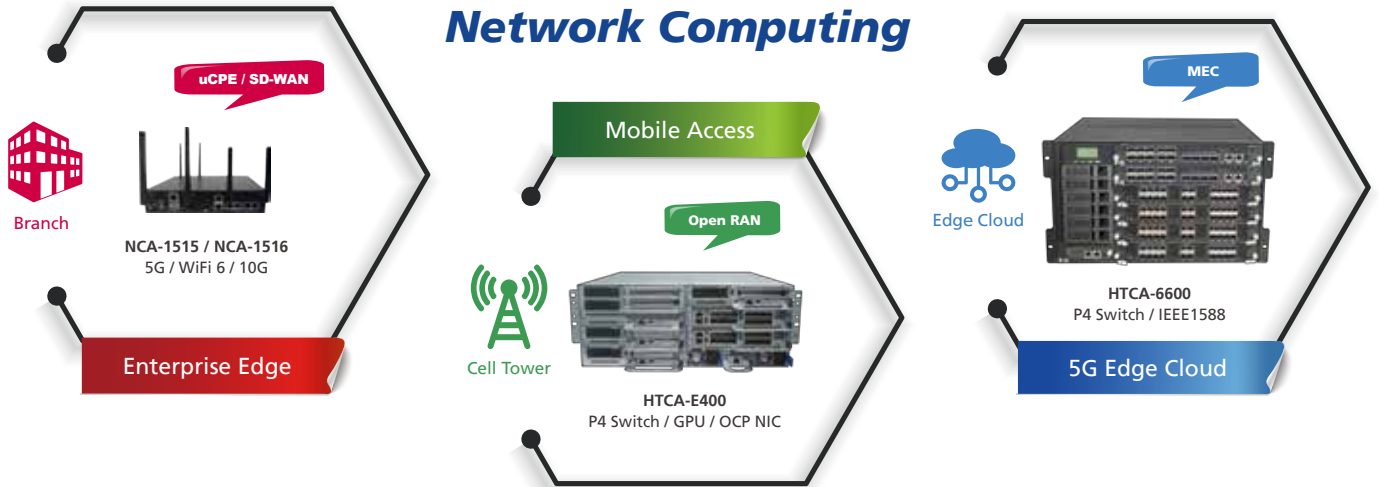
By harnessing the capabilities of Lanner Edge Servers and uCPE platforms alongside the potential of 5G technology, a realm of possibilities is unveiled for MEC, Open RAN, and Private Network deployments. Leveraging 5G's improved throughput, ultra-low latency, and network slicing capabilities empowers organizations to establish dedicated, high-performance networks tailored to their specific requirements. This empowers industries such as manufacturing, healthcare, logistics, and smart cities to fully utilize the advantages of 5G connectivity for vital applications, real-time analytics, autonomous systems, and seamless connectivity throughout their operations.

Jeans Tseng
CTO

Network Appliances for SDN/NFV

Driving 5G Edge Network Computing

uCPE / SD-WAN

Branch

NCA-1515 / NCA-1516
5G / WiFi 6 / 10G

Enterprise Edge

Mobile Access

Open RAN

Cell Tower

HTCA-E400
P4 Switch / GPU / OCP NIC

MEC

Edge Cloud

HTCA-6600
P4 Switch / IEEE1588

5G Edge Cloud

With advancements in networking technologies such as SDN and NFV, communication service providers gain the flexibility and agility needed to evolve their new services. Designed for next-generation network virtualization, Lanner offers carrier-grade, NEBS-compliant communication platforms with robust computing power, modular I/O flexibility, WiFi/LTE connectivity, and a comprehensive redundancy design. These high-availability SDN/NFV-ready platforms are well-suited for functioning as virtual CPEs, virtual Routers, NFVi appliances, and MEC platforms within today's dynamic telecom environments.

SD-WAN uCPE

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

Hyper Converged Infrastructure

HCI-ready platforms with multi-node computing, switching, and storage in a single appliance
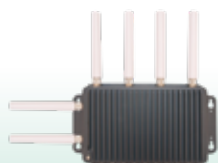
Mobile Edge Computing

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

5G Edge Open RAN

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

Outdoor Edge Computing

5G/WiFi 6-ready platforms for telco central offices and data centers in edge networks

vRouter vBNG

Customizable and scalable whitebox hardware platforms for vRouter and vBNG

SDN/NFV Ecosystem Partners

Intel

Lanner is a Titanium Partner of the Intel® Network Builders Winner's CIrcle, 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.

Zscaler

Zscaler Zero Trust Exchange software enables secure access for users, workloads, and devices to the internet and multi-cloud applications with zero trust connectivity.

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.

6 WIND

6WIND Virtual Security Gateway offers security capabilities along with performance and scalability to address end-to-end security challenges faced by service providers and enterprises.

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 & uCPE

SD-WAN is rapidly emerging as the most highly anticipated WAN service today. According to the latest Gartner Report on WAN Edge Infrastructure, over the next five years, more than 90% of WAN edge infrastructure is expected to transition to uCPE platforms or SD-WAN, displacing traditional routers. This shift reflects the move towards effectively managing network connectivity and resources, spanning from distributed branches to data centers and the cloud.
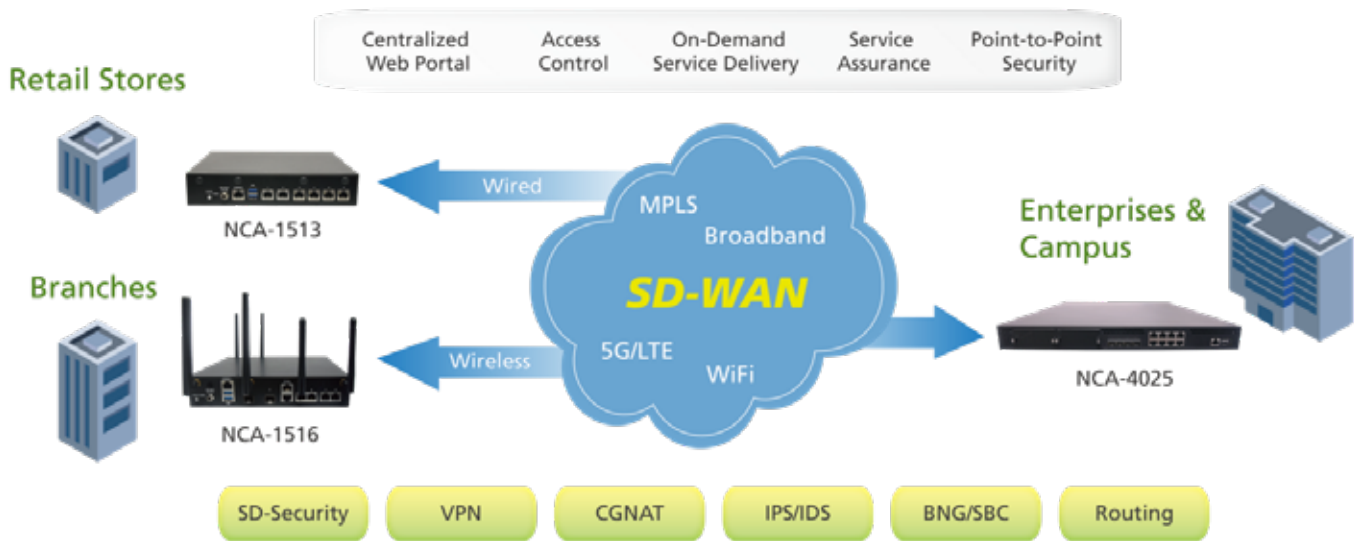
uCPE Platforms Designed Specifically for SD-WAN

Lanner has played a significant role in SD-WAN deployment methodologies, ranging from designing dedicated network appliances tailored for managed service providers to constructing NFV-based platforms capable of hosting VNFs from multiple vendors. These uCPE platforms have been embraced by world-leading SD-WAN solution providers, spanning traditional WAN optimization firms, communication service providers, software start-ups, and cloud-based services.

NCA-6530 Sapphire Rapids

NCA-4035 Skylake-D

NCA-1516 Denverton

NCA-1513 Denverton

NCA-1040 Elkhart Lake

Whitebox Solutions

Drawing upon our proficiency in network security and IT edge computing, Lanner Whitebox Solutions™ offer genuine white box networking platforms that fulfill a majority of the specifications sought by customers. These platforms are complemented by WiFi and LTE certifications, enabling their global utilization.

Whitebox Solutions™ encompass performance-optimized desktop and rackmount appliances, driven by cutting-edge, high core-count x86 processors. Leveraging packet delivery and virtualization technologies, our white box appliances achieve substantial throughput improvements, particularly when executing numerous compute-intensive VNFs within SDN/NFV infrastructure.

PRE-ZERO-DAY READY UCPE PLATFORMS
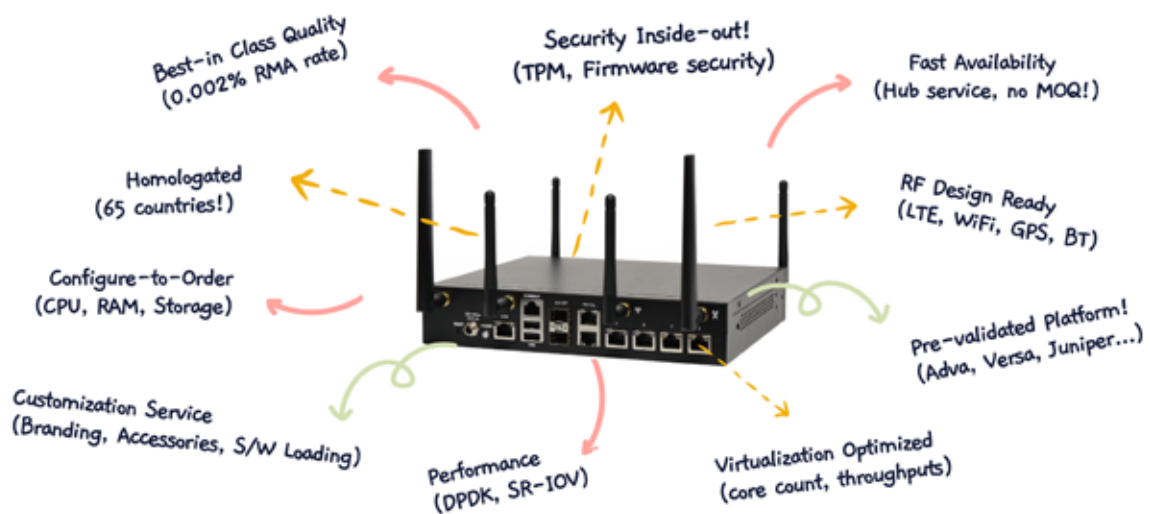
Pre-Validated Solutions for Rapid Time-to-Market Deployment

Lanner's whitebox solutions are pre-validated and meticulously optimized in collaboration with leading SD-WAN VNF vendors. These solutions are purposefully engineered to expedite the deployment process for communication service providers, ensuring swift entry to the market.

Network Appliances

Feature	Description	NCA-1040	NCA-1510	NCA-1513
Form Factor		Desktop	Fanless Desktop	Desktop
Platform	Processor Options	Intel® Atom X6413E (Elkhart Lake)	Intel® Atom™ C3000 (Denverton), 2~8C	Intel® Atom® C3000 (Denverton)
	CPU Socket	onboard	onboard	onboard
	Chipset	SoC	SoC	SoC
	Security Acceleration	N/A	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 3200 MHz SODIMM	DDR4 2133 MHz ECC/Non-ECC DIMM	DDR4 2133/1866 MHz ECC/Non-ECC SODIMM (By SKU)
	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® i210AT	4 x GbE RJ45 Intel® SoC Integrated MAC 2 x GbE RJ45 or SFP Intel® i210 (By SKU)	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)
	Bypass	N/A	1 pair Gen3 (By SKU)	2 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/M.2/Mini PCIe	Power/Status/Storage	Power/Status/Storage
	Power Button	1	1	1
	Console	1 x RJ45	1 x Mini USB	1 x RJ-45
	USB	1 x USB 3.0	2 x USB 2.0	2 x USB 2.0 or 2 x USB 3.0 (by SKU)
	LCD Module	N/A	N/A	N/A
	Display	1 x Display Port (No Audio)	N/A	N/A
	Power Input	1 x DC Jack With Lock	1 x DC Jack	1 x DC Jack
Storage	HDD/SSD Support	N/A	1 x 2.5" Bay (Optional)	1 x 2.5" Bay (Optional)
	Onboard Storage	1 x M.2 (SATA)	1 x EMMC 8GB	1 x EMMC 8GB (SKU A/B/C/D)
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) 3042/3052 B Key 2x Nano SIM	1 x Mini-PCIe (PCIe) 1 x M.2 (USB2.0/PCIe) 1 x 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
Miscellaneous	Watchdog	Yes	Yes	Yes
	Internal RTC with Li Battery	Yes	Yes	Yes
	TPM	N/A	Yes	Yes
Cooling	Processor	Passisve CPU heatsink	Passisve CPU heatsink	Passisve CPU heatsink
	System	Fanless (Default); 1 x 5-pin Fan Connector (Optional)	Fanless	1 x Cooling Fan w/ Smart Fan
Environmental Parameters	Temperature	0~40ºC Operating -40~70ºC Non-Operating	0~50ºC Operating (SKU A/B/C) 0~40ºC Operating (SKU D) -20~70ºC Non-Operating	0~40ºC Operating -20~70ºC 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)	TBD	325 x 305 x 120 mm	358 x 135 x 290 mm
	Weight	TBD	2.2 kg	2.75 kg
Power	Type / Watts	60W Power Adapter	36W or 60W Power Adapter (By SKU)	40W Power Adapter
	Input	AC 100~240V @50~60Hz	AC 100~240V @50~60 Hz	AC 100~240V @50~60Hz, 1.7A
Approvals and Compliance		RoHS, CE/FCC Class B (Class A with PoE), 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)	Intel® Atom® C3000 (Denverton)	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
32 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 SoC Integrated MAC (Optional PoE+ Support) 2 x SFP+ SoC Integrated MAC	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 (Using Optional LTE Module)	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 (Using Optional LTE Module)	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 (SKU A~E) 2 x Cooling Fans w/ Smart Fan (SKU F)	2 x Cooling Fans w/ Smart Fan or Fanless (By Request)	Fanless	Fanless
0~40℃ Operating -20~70℃ Non-Operating	0~40℃ Operating -20~70℃ Non-Operating	-40~70℃ Operating (SKU A/B) -40~60℃ Operating (SKU C) -40~85℃ Non-Operating	-40~70℃ Operating (SKU D & F) -40~60℃ Operating (SKU C & E) -40~85℃ 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

Network Appliances

Feature	Description	NCA-1525	NCA-1526	VP-200
Form Factor		Desktop	Desktop	Desktop
Platform	Processor Options	Intel® Atom® C5325/C5315 (Parker Ridge)	Intel® Atom® C5325/C5315 (Parker Ridge)	NXP LS1046A
	CPU Socket	onboard	onboard	onboard
	Chipset	SoC	SoC	SoC
	Security Acceleration	Intel® QuickAssist Technology	Intel QuickAssist Technology	N/A
BIOS		AMI SPI Flash BIOS	AMI SPI Flash BIOS	N/A
System Memory	Technology	DDR4 2933/2400 MHz ECC/Non-ECC SODIMM	DDR4 2933/2400 MHz ECC/Non-ECC SODIMM	DDR4 2100 MHz UDIMM
	Max. Capacity	64 GB	64 GB	32 GB
	Socket	2 x 260-pin SODIMM	2 x 260-pin SODIMM	1 x 260-pin SODIMM
Networking	Ethernet Ports	4x GbE RJ45, 2x 10G SFP+, 2x 2.5G RJ45 (PoE+ Support Optional)	4x GbE RJ45, 2x 10G SFP+, 2x GbE RJ45 (PoE+ Support Optional)	2x SFP/RJ45 GbE Combo Ports, 4x RJ45 GbE Ports (2x PoE+ Support Optional)
	Bypass	N/A	N/A	1 x Pair of Gen 3 (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 RJ-45
	USB	2 x USB 3.0	2 x USB 3.0	1 x USB 3.0
	LCD Module	N/A	N/A	N/A
	Display	N/A	N/A	N/A
	Power Input	2 x DC Jack With Lock	2 x DC Jack	2 x DC Jack
Storage	HDD/SSD Support	N/A	N/A	N/A
	Onboard Storage	N/A	N/A	N/A
Expansion	PCIe	N/A	N/A	N/A
	mini-PCIe	1 x Mini-PCIe (PCIe/USB2.0) 2 x M.2 3042/3052 B Key (USB3.0) 1 x M.2 2280 B Key (SATA), 2 x Nano SIM for M.2	1 x Mini-PCIe (PCIe/USB2.0) 2 x M.2 3042/3052 B Key (USB3.0) 1 x M.2 2280 B Key (SATA) 2 x Nano SIM for M.2	2x Nano SIM
Miscellaneous	Watchdog	Yes	Yes	Yes
	Internal RTC with Li Battery	Yes	Yes	Yes
	TPM	Yes	Yes	N/A
Cooling	Processor	Passisve CPU heatsink	Passive CPU Heatsink	Passive CPU Heatsink
	System	2 x Cooling Fan w/ Smart Fan	2 x Cooling Fan w/ Smart Fan	Fanless
Environmental Parameters	Temperature	0~40°C Operating -40~70°C Non-Operating	0~40°C Operating -40~70°C Non-Operating	0~40°C Operating -40~70°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)	251 x 44 x 200 mm	251 x 44 x 200 mm	231 x 44 x 200 mm
	Weight	TBD	TBD	2 kg
Package Dimensions	(WxHxD)	TBD	TBD	TBD
	Weight	TBD	TBD	TBD
Power	Type / Watts	90W Power Adapter	90W Power Adapter	60W Power Adapter
	Input	AC 100~240V @50~60 Hz	AC 100~240V @50~60 Hz	AC 90~264V @47~63 Hz
Approvals and Compliance		RoHS, CE/FCC Class B (Without PoE+), UL, VCCI, UKCA	RoHS, CE/FCC Class B (Without PoE+), UL, VCCI, UKCA	RoHS, CE/FCC Class B (Without PoE), UL, UKCA, VCCI (By Request)

	NCA-2520/2522	NCA-4030	NCA-4035	NCA-5540
	1U 19" Rackmount	1U 19" Rackmount	1U 19" Rackmount	1U 19" Rackmount
	Intel® Atom P5300 (Snow Ridge NS)	Intel® Xeon® D-1700 4~10 Cores	Intel® Xeon® D2700 4~20 Cores	4th Gen Intel® Xeon® Scalable processor (Sapphire Rapids SP)
	onboard	1 x Onboard LGA1150	1 x Onboard	1 x LGA4677
	SoC	N/A	N/A	Intel® Emmitsburg PCH
	N/A	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	AMI SPI Flash BIOS
	DDR4 2933MHz REG Or Non-ECC UDIMM	DDR4 2933MHz REG or ECC/Non-ECC RDIMM	DDR4 3200 MHz REG ECC Or Non-ECC UDIMM/RDIMM	DDR5 4800MHz REG DIMM
	256GB	128GB	256GB	768GB
	4 x 288-pin DIMM	4 x 288-pin DIMM	4 x 288-pin DIMM	12 x 288pin DIMM
	8x GbE RJ45 Intel i350-AM4, 4x 10G SFP+ Intel SoC Integrated MAC, 4x 10G SFP+ Intel C827 Via SFI Signal (By Project)	4 x 1G RJ45, 1 x 2.5G RJ45, 1 x 1G RJ45 (LOM), 4 x 10G SFP+	2 x GbE RJ45 Via I210-AT 8 x GbE RJ45 Via I350-AM4 4 x 10G SFP+ (Default) 4 x 25G SFP28 (By OEM Project)	2 x GbE RJ45 Intel i226 LM
	2 pairs Gen3	N/A	N/A	Depends on NIC Module Specifications
	1	2	2	4 or 2
	Optional	1 x RJ45	1 x RJ45	Yes, 1x LOM Port (Via BMC Chip)
	N/A	Yes	Yes	Yes (Support AST2600 IPMI Card)
	1	1	1	1
	Power/Status/Storage	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 ATX Power switch
	1 x RJ45	1 x RJ45	1 x RJ45	1 x RJ45
	2 x USB 2.0	2 x USB 3.0	2 x USB 3.0	2 x USB 3.0
	N/A	N/A	N/A	N/A (Optional)
	1x VGA From OPMA Slot (Optional)	N/A	N/A	Yes (VGA Via IAC-AST2600 IPMI Card)
	AC Power Inlet on PSU	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	N/A	2 or 4 x 2.5" Internal
	1x M.2 (SATA III/PCIe*2 Signal)	1 x M.2	2 x M.2 2280 / 1 x M.2 2242	1 x M.2 (SATA) 2280 B+M Key 2 x M.2 NvME (PCIe) 2280 M Key
	1x PCI-E*8 Or 2x PCI-E*4 FH/HL (By Project)	1 x PCI-E*8 FH/HL (Optional), 1 x PGN LTE Module (Optional)	1 x Gen4 PCIe*8 & 1 x Gen4 PCIe*16	1 x PCI-E*8 HH/HL (Optional)
	1x Mini-PCIe (PCIe/USB2.0)	N/A	N/A	N/A
	Yes	Yes	Yes	Yes
	Yes	Yes	Yes	Yes
	N/A	Yes (optional)	Yes	Yes (Optional TPM2.0)
	Passive CPU heatsink	Passive CPU heatsink	Passive CPU heatsink	Passive CPU heatsink
	3 x cooling fans with smart fan	3 x cooling fans with smart fan	4 x cooling fans with smart fan	5 x 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	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	5~90% Operating 5~95% Non-Operating
	438 x 429 x 44 mm	438 x 510 x 44 mm	438 x 44 x 321 mm	438 x 650 x 44 mm
	10.1 kg	9.4 kg	8.6 kg	10.5kg
	TBD	739 x 215 x 582 mm	739 x 215 x 582 mm	TBA
	TBD	13 kg	15 kg	TBA
	300W 1+1 AC/DC Redundant CRPS PSU	450W 1+1 Redundant PSU	300W 1+1 Redundant PSUs Or 350W Single PSU	1300W CRPS AC PSU
	AC 90~264V @47~63Hz	AC 90~264V @47~63 Hz	Redundant: AC 100~240V @50~60Hz Single: AC 100~240V @47~63Hz	TBA
	RoHS, CE/FCC Class A, UL	CE/FCC Class A, UL, RoHS	CE/FCC Class A, UL, RoHS	RoHS, CE/FCC Class A, UKCA, UL

Network Appliances

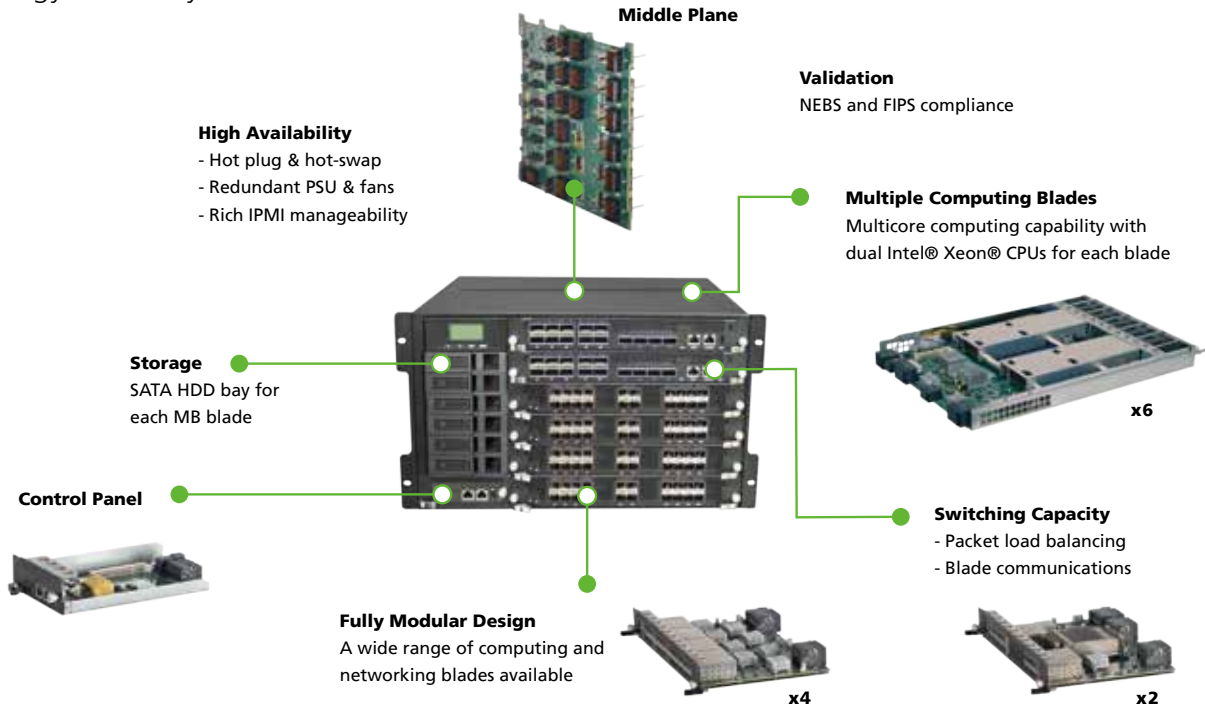| Feature	Description	NCA-6040	NCA-6520	NCA-6530
Form Factor		2U 19" Rackmount	2U 19" Rackmount	2U 19" Rackmount
Platform	Processor Options	4th Gen IIntel® Xeon® Processor Scalable Family (Sapphire Rapids-SP)	3rd Gen Intel® Xeon® Scalable CPU (Ice Lake SP)	4th Gen Intel® Xeon® Processor Scalable Family (Sapphire Rapids-SP)
	CPU Socket	1 x LGA 4677	2 x LGA4189	2 x LGA 4677
	Chipset	Intel® C741	Intel® C627A	Intel® C741
	Security Acceleration	Intel® QuickAssist Technology	Intel® QuickAssist Technology	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology	DDR5 4800MHz RDIMM	DDR4 3200/2933/2666/2400/2133MHz RDIMM/LRDIMM	DDR5 4800MHz RDIMM
	Max. Capacity	768GB	1536GB	1536GB
	Socket	12 x 288pin DIMM	24 x 288-pin DIMM	24 x 288-pin DIMM
Networking	Ethernet Ports	2 x GbE RJ45 With LED Dual MGT By Intel® I226-LM	2 x GbE RJ45 Intel® i350-AM2	2 x GbE RJ45 Intel® i350-AM2
	Bypass	N/A	Depends on NIC Module Specifications	Depends on NIC Module Specifications
	NIC Module Slot	8 Or 4	8	8
LOM	I/O Interface	Yes, 1x LOM Port (Via BMC Chip)	1 x RJ45	1 x RJ45
	OPMA Slot	Yes (Support AST2600 IPMI Card)	IPMI Onboard	IPMI Onboard
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	2 x USB 3.0
	LCD Module	N/A	N/A	Yes
	Display	VGA (Via IPMI Card)	1 x VGA (Optional)	1 x VGA (Internal Pin Header)
	Power Input	AC power inlet on PSU	AC power inlet on PSU	AC power inlet on PSU
Storage	HDD/SSD Support	2 x 3.5" Or 2x2.5" HDD/SSD	2x 3.5" or 2.5" Swappable	SKU A & C: 2 x 2.5" Swappable
	Onboard Storage	1 x M.2 (SATA) 2280 B+M Key, 2 x M.2 NvME (PCIe) 2280 M Key	2x M.2 (NVME); 1x M.2 (SATA)	2x M.2 NVME 2280; 1x M.2 2280 SATA
Expansion	PCIe	1 x PCI-E*8 FH/HL (Optional)	N/A (Optional) SKU A: 1x PCIe x16 Gen 4 FH/FL Size Bracket & 1x PCIe x16 Gen 4 FH/HL Size Bracket (Optional) SKU B: 2x PCIe x16 Gen 4 FH/FL Size Bracket	SKU A: N/A (Default); 2x PCIE x16 FH/HL Dual Slots (Optional) SKU C: N/A (Default); 2x PCIE x16 FH/HL Dual Slots (Optional)
	mini-PCIe	N/A	N/A	N/A
Miscellaneous	Watchdog	Yes	Yes	Yes
	Internal RTC with Li Battery	Yes	Yes	Yes
	TPM	Optional	TPM2.0 (Optional)	TPM2.0 (Optional)
Cooling	Processor	Passive CPU heatsink	Passive CPU heatsink	Passive CPU heatsink
	System	4 x Smart Fans	4 x Individual Hot-swappable cooling fan with smart fan	6 x Individual Hot-swappable Cooling Fans with Smart Fan
Environmental Parameters	Temperature	0~40ºC Operating -40~70ºC Non-Operating	0~40ºC Operating -20~70ºC Non-Operating	0~40ºC Operating -20~70ºC 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)	438 x 650 x 88 mm	438 x 720 x 88mm	438mm x 760mm x 88mm
	Weight	24 kg	19.3kg	21.2kg
Package Dimensions	(WxHxD)	TBD	588 x 997 x 250mm	588mm x 926mm x 303mm
	Weight	TBD	32 kg	31.2 kg
Power	Type / Watts	1600W CRPS AC PSU	Default: 1300W/2000W 1+1 ATX Redundant PSUs Optional: 1600W 1+1 ATX Redundant PSUs	1600W/2000W 1+1 ATX Redundant PSUs
	Input	TBD	AC 90~264V @47~63Hz	AC 200~240V @50~60Hz
Approvals and Compliance		RoHS, CE/FCC Class A, UKCA, UL	RoHS/RoHS, CE, FCC Class A, UL	RoHS/RoHS, CE, FCC Class A, UL

NCA-4112	NCA-5310	NCA-6120
1U 19" Rackmount	1U 19" Rackmount	2U 19" Rackmount
AMD EPYC™ 3000 Series (4~8 Cores)	AMD 3rd Gen EPYC™ Processor Family (Codenamed Milan)	AMD EPYC 7000 Series With Support For Milan & Rome (64C/128T)
SP4r2	SP3	SP3
SoC	N/A	N/A
10Gbps Encryption + 10Gbps Decryption	40Gbps Encryption + 40Gbps Decryption	40Gbps Encryption + 40Gbps Decryption
AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
DDR4 2666 MHz ECC/U/R DIMM	DDR4 3200MHz ECC REG DIMM	DDR4 3200MHz ECC REG DIMM
128GB	512GB	1024GB
4 x 288-pin DIMM	8 x 288-pin DIMM	16 x 288-pin DIMM
8 x GbE RJ45 Intel® i350-AM4 2 x 10G SFP+	1 x GbE RJ45 Intel® i210	1 x GbE RJ45 Intel® i210
3 x Pairs of Gen3	N/A	N/A
1	Max. 4, 2x (Default), 2x (With Optional Kit)	8 Or 4 (By SKU)
1 x RJ45	1 x RJ45	1 x RJ45
Yes	Yes	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 3.0	2 x USB 3.0	2 x USB 3.0
1 x LCM, 4 x Keypads	N/A	N/A
From OPMA Slot for VGA (Optional)	1 x VGA (Optional)	1 x VGA (Optional)
AC Power Inlet on PSU	AC Power Inlet on PSU	AC Power Inlet on PSU
2 x 2.5" Swappable Bays	2 x 2.5" Swappable Bays	SKU A: 4 x 2.5" or 3.5" SKU B: 2 x 2.5" or 3.5"
N/A	1 x 22110/2280 M.2 Slot	1 x M.2 (SATA/PCIe) 2280
N/A	1 x PCIe*8 FHHL	2x PCIe*8 FHHL or 1x PCIe*16 FHHL
1 x 2242 M.2, 1 x Mini-PCIe, 1 x LTE (Optional)	N/A	N/A / Max. 1TB
Yes	Yes	Yes
Yes	Yes	Yes
TPM 1.2/2.0	Yes (Optional)	Yes (Optional)
Passive CPU Heatsink	Passive CPU Heatsink	Passive CPU Heatsink
2 x Cooling Fans w/ Smart Fan	5 x Individual Hot-swappable Cooling Fans	4 x Individual Hot-swappable Cooling Fans
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 431 x 44 mm	438 x 610 x 44 mm	438 x 600 x 88 mm
8.6 kg	10.6 kg	24 kg
582 x 548 x 182 mm	739 x 582 x 215 mm	825 x 600 x 270 mm
13 kg	15 kg	26 kg
300W Redundant PSUs	550W 1+1 ATX Redundant PSUs	850W 1+1 ATX Redundant PSUs
100~240VAC @50~60Hz, 5~3A	AC 100V~240V @47~63Hz	AC 100V~240V @47~63Hz
RoHS, CE, FCC, UL	RoHS, CE, FCC, UL	RoHS, CE, FCC, UL

Multi-Access Edge Computing (MEC)

MEC (Multi-Access Edge Computing) pertains to the capability of executing essential core network functions, encompassing compute, storage, and analytics, at the network edge. This approach significantly diminishes latency by directing traffic to the edge before routing it directly to the cloud. Within this framework, orchestration amalgamates compute and storage resources, alongside networking capabilities, to facilitate the operation of user applications at the edge, strategically positioned near the point of request and traffic generation.

Reduction in Total Cost of Ownership

The implementation of virtualization technology has led to a substantial reduction in telecom deployment costs when compared to traditional core-driven architecture. By utilizing a high-performance, virtualized MEC server, the total cost of ownership (TCO) can be slashed by over 90%, resulting in savings of 75% in space utilization and a remarkable 66% reduction in power consumption.

HybridTCA Architecture

Lanner's HybridTCA Platforms seamlessly integrate control, management, and data processing within a unified system, offering distinct advantages over the prevailing AdvancedTCA infrastructure. These advantages encompass superior hardware design, enhanced customization options, and improved cost and energy efficiency.

Middle Plane

Validation
NEBS and FIPS compliance

High Availability
- Hot plug & hot-swap
- Redundant PSU & fans
- Rich IPMI manageability

Multiple Computing Blades
Multicore computing capability with dual Intel® Xeon® CPUs for each blade

x6

Storage
SATA HDD bay for each MB blade

Control Panel

Switching Capacity
- Packet load balancing
- Blade communications

Fully Modular Design
A wide range of computing and networking blades available

x4

x2

Compute and Networking Blades

Lanner's lineup of HTCA-compatible and swappable blades offers a heightened level of redundancy, interoperability, flexibility, increased bandwidth, and performance enhancements.

Blades	Picture	Features/Ports	Chipset
NEW HMB-6130		2 x 4th Gen Intel® Xeon® Scalable Processor (Sapphire Rapids)	Intel C741
HCM-1030		6x 100GbE QSFP28, 4x 40GbE QSFP+, 16x 10GbE SFP+, IEEE 1588 expansion module	Broadcom StrataXGS Tomahawk BCM56960
NEW HDM-1006		Hot Swappable 6x NVMe SSD Trays Max up to 3.2TB/18W NVMe SSD	N/A
HLM-1101		14x 100GbE QSFP28	Intel Tofino T10-032D switch controller
HLM-1021		2x 100GbE QSFP28, 16x 25/10GbE SFP28, 4x 10GbE RJ45	Broadcom StrataXGS Trident-III BCM 56770
NEW HLM-1001		20 port 10GbE SFP+	Intel XL710 Ethernet Controller

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.

5G Open RAN

OpenRAN is poised to usher in the next revolution for Radio Access Network (RAN) infrastructure, representing an optimal solution to enhance capacity and coverage while mitigating latency arising from the burgeoning data demands on the 5G network. OpenRAN solutions introduce flexibility and scalability by disassembling hardware and software components, utilizing Commercial-Off-The-Shelf (COTS) hardware.

The rapid expansion of Open RAN has fueled a wave of innovations in wireless connectivity, fostering diversity in both service offerings and supply chains. The disaggregation of radio access networks facilitates the adoption of open interfaces, contributing to this dynamic evolution. With a commitment to pre-validated Open RAN solutions, Lanner and its ecosystem partners are steadfast in expediting Open RAN deployments, aiming to achieve economies of scale.
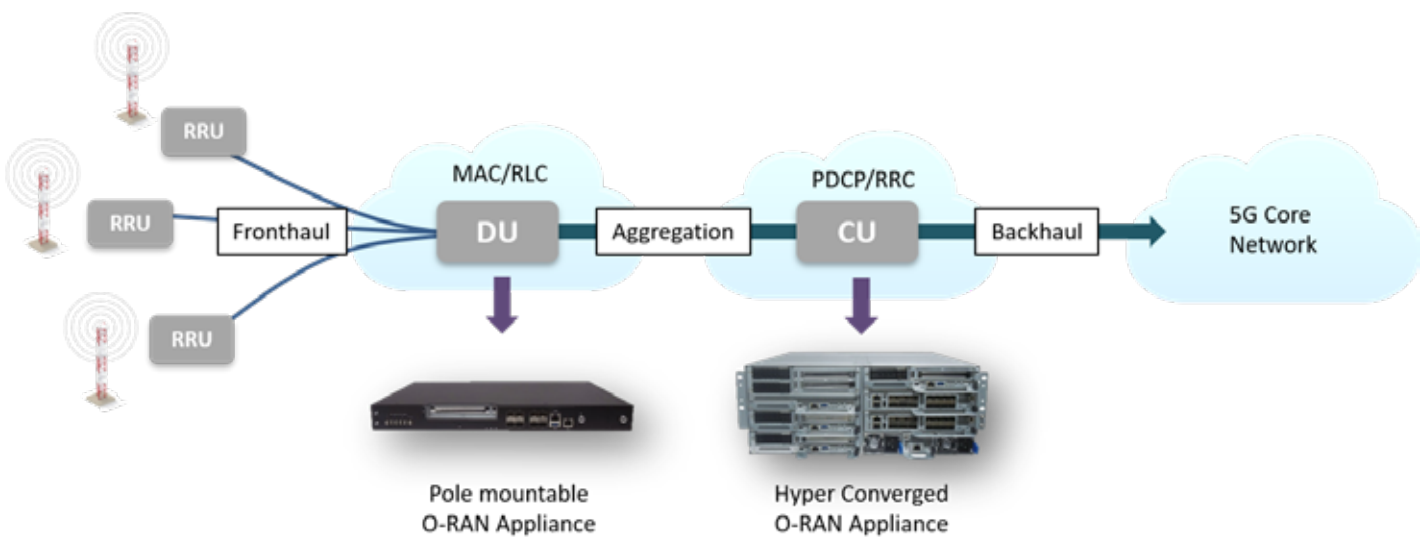
Network Appliances for Open RAN

Open RAN offers automation, dynamic scalability, and improved 5G radio performance. Its open edge architecture and multi-vendor compatibility enable flexible hardware and software setups, meeting CSPs' cost-efficiency demands. Lanner's Open RAN appliance delivers high-performance for 5G networks.

ECA-5540
- Intel® Sapphire Rapids SP/EE Processor
- Intel vRAN Boost Support (Sapphire Rapids EE)
- Short Depth Chassis and Front I/O Design
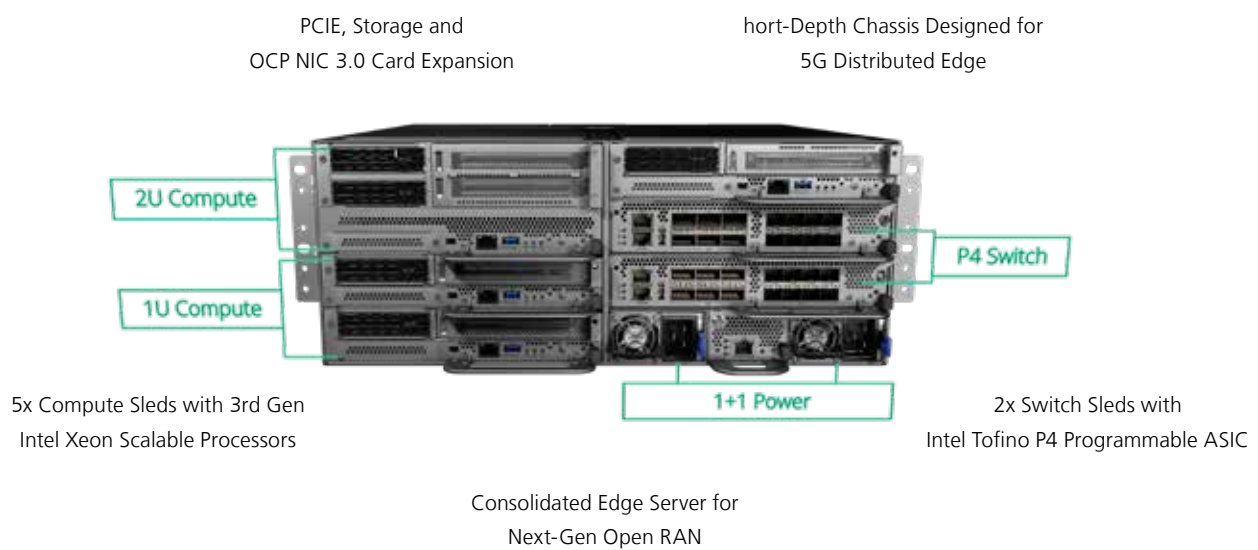- 1x OCP 3.0 NIC, 1x FHFL PCIex16 slot, 2xLP or 1xFHHL slot (PCIex8)

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

Lanner's HTCA-E400, driven by five Intel Xeon Scalable Processors, stands as a consolidated hyper-converged edge server meticulously crafted for OpenRAN infrastructure. This versatile HTCA-E400 platform is further empowered by Intel Tofino P4 and FPGA/GPU acceleration, boasting programmable and intelligent switching capabilities. This distinct architecture aids in offloading open architecture CPUs, ensuring long-term cost-effectiveness. The HTCA-E400's support for protocol-independent and multi-Tbps networking performance eliminates hardware bottlenecks, presenting a robust and future-proof solution.

PCIE, Storage and OCP NIC 3.0 Card Expansion

hort-Depth Chassis Designed for 5G Distributed Edge

5x Compute Sleds with 3rd Gen Intel Xeon Scalable Processors

2x Switch Sleds with Intel Tofino P4 Programmable ASIC

Consolidated Edge Server for Next-Gen Open RAN

Compute and Switch Sleds

Lanner's HTCA-E400 compatible and swappable sleds lineup offers improved redundancy, interoperability, flexibility, increased bandwidth, and enhanced performance.

Blades	Picture	Features/Ports	Chipset
HTCA-E400		HybridTCA™ 4U telecom network appliance chassis	N/A
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.

Edge Server & O-RAN Appliances

Feature	Description	ECA-4027	ECA-5540	HTCA-6200
Form Factor		1U Rackmount	1U Rackmount	2U Rackmount
Platform	Processor Options	Intel® Xeon® D2100 12/16 Cores	Intel® Xeon® Scalable Processor (Sapphire Rapids-SP)	Up to 4x Intel® Xeon® Scalable Processor (Ice Lake-SP/Sapphire Rapids-SP)
	Chipset	SoC	Intel C741	Intel C621/C627/C741
OS Support		Linux Kernel 2.6 or above	Linux Kernel 2.6 or above	Linux Kernel 2.6 or above
System Memory	Technology	DDR4 2666MHz REG DIMM	DDR5 4400 MHz RDIMM	DDR5 4800 MHz REG DIMM
	Max. Capacity	64 GB	1024 GB	1024GB per blade
	Socket	2 x 288-pin DIMM	16 x 288-pin DIMM	16x 288pin DIMM per blade
Storage	SATA/M2	2 x 2.5" Internal 2 x M.2 NVMe 2280 M key	2 x 2.5" HDD/SSD 2 x M.2 NvME (PCIe) 2280 M key	2 x 2.5" Swappable HDD drive bays
Networking	Ethernet Ports	1 x GbE RJ45 (i210/BMC) 8 x 10G SFP+, 2 x 40G QSFP+	1x 1GbE Rj45 for MGMT	Blade 1~2: Switch Fabric Blade or Ethernet I/O Blade
	Bypass	N/A	N/A	N/A
	Controllers	Intel i210 and BCM56172	N/A	Depends on blade specification (HLM series)
	NIC Module Slot / Blade	N/A	1x OCP NIC	N/A
	IPMI	1 x onboard IPMI port	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 RJ-45	1 x RJ-45	1 x RJ-45
	USB	1 x USB 3.0	2 x USB 3.0	1 x USB 2.0
Expansion	PCIe	1 x PCI-E*16 FH/HL, support 75W device (by project)	1x FHFL (PCIex16, double width, 350W) 2xLP (PCIex8) or 1xFHHL (PCIex8)	N/A
	mini-PCIe	N/A	N/A	N/A
Cooling	Processor	Passive CPU Heatsink	Passive CPU Heatsink	CPU heatsink with fan duct
	System	5 x smart fans	5x swappable cooling fans with smart fan	5 x hot-swappable cooling fans per blade
Environmental Parameters	Temperature	-40~65ºC Operating -40~70ºC Non-Operating	-40~65ºC Operating -40~70ºC Non-Operating	0 ~ 40ºC Operating -20~70ºC 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	N/A	2 x 20 characters
	Watchdog	Yes	Yes	Yes
	Internal RTC with Li Battery	Yes	Yes	Yes
Dimensions	Dimensions (WxHxD)	438 x 371 x 44 mm	438x580x44 mm	438 x 88 x 685 mm
	Weight	5 kg	TBD	26 kg
Power	Watts / Type	400W 1+1 Redundant PSU	1600W AC PSU	AC 2000 watt N+1 Redundant per blade DC 1600 watt N+1 Redundant per blade PM bus support
	Input	-57 VDC ~ -40VDC dual input feed	AC 110 -240V	AC 85 ~ 264 V DC -36V ~ -72V
Approvals & Compliance		CE/FCC Class A, UL	TBD	CE Class A, FCC Class A, RoHS, NEBS design compliance

HTCA-E400 NEW	HTCA-6400	HTCA-6600
4U Rackmount	4U Rackmount	6U Rackmount
Up to 5x Intel® Xeon® Scalable Processor (Ice Lake-SP)	Up to 4x Intel® Xeon® Scalable Processor (Ice Lake-SP/Sapphire Rapids-SP)	Up to 4x Intel® Xeon® Scalable Processor (Ice Lake-SP/Sapphire Rapids-SP)
Intel C621/C627	Intel C621/C627/C741	Intel C621/C627/C741
Linux Kernel 2.6 or above	Linux Kernel 2.6 or above	Linux Kernel 2.6 or above
DDR4 DIMMs	DDR5 4800 MHz REG DIMM	DDR5 4800 MHz REG DIMM
512GB per compute sled	1024GB per blade	1024GB per blade
8x 288pin DIMM per compute sled	16x 288pin DIMM per blade	16x 288pin DIMM per blade
2 x 2.5" Swappable HDD drive bays	8 x 2.5" Swappable HDD drive bays	6 x 3.5" Swappable HDD drive bays
2x Switch Fabric Sleds	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
Depends on blade specification	Depends on blade specification (HLM series)	Depends on blade specification (HLM series)
1x OCP NIC per compute sled	N/A	N/A
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
Yes	Yes	Yes
1 x RJ-45	1 x RJ-45	1 x RJ-45
N/A	1 x USB 2.0	1 x USB 2.0
1x PCIe slot per sled 2U Compute sled: FH3/4L double or single width PCIe Card 1U Compute sled: single width PCIe Card	N/A	N/A
N/A	N/A	N/A
CPU heatsink with fan duct	CPU heatsink with fan duct	CPU heatsink with fan duct
4 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 blade	5 x hot-swappable cooling fans per blade
0 ~ 40ºC Operating -20~70ºC Non-Operating	0 ~ 40ºC Operating -20~70ºC Non-Operating	0 ~ 40ºC Operating -20~70ºC Non-Operating
5 ~ 90% Operating 5 ~ 95% Non-Operating	5 ~ 90% Operating 5 ~ 95% Non-Operating	5 ~ 90% Operating 5 ~ 95% Non-Operating
N/A	2 x 20 characters	2 x 20 characters
Yes	Yes	Yes
Yes	Yes	Yes
438 x 88 x 685 mm	438 x 177.3 x 685 mm	438 x 265.9 x 685 mm
27.5 kg	40 kg	55 kg
AC 3000W 1+1 Redundant PSU DC 1600W 220V 1+1 Redundant PSU	AC 2000 watt N+1 Redundant per blade DC 1600 watt N+1 Redundant per blade PM bus support	AC 1200 watt N+1 Redundant per blade DC 1010 watt N+1 Redundant per blade PM bus support
DC -36V ~ -72V	AC 85 ~ 264 V DC -36V ~ -72V	AC 85 ~ 264 V DC -36V ~ -72V
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

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