Lanner

uCPE SD-WAN Solutions

Innovative Platforms for Next Generation SDN/NFV Infrastructure




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 vCPE 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.

NCA-5710

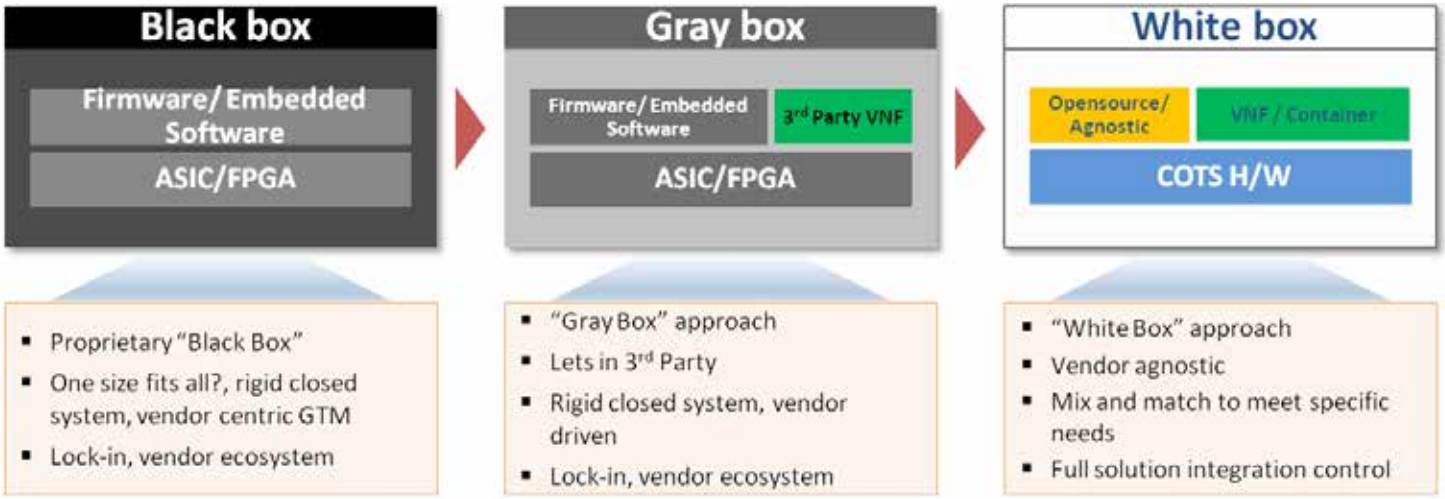
NCA-4020

NCA-1515

NCA-1513

LUNA-D125

Service Model -whitebox/Grey/proprietary



SDN (software defined networking) and NFV (network function virtualization) both have revolutionized network infrastructure by decoupling the software from the hardware, which promises the liberation from proprietary hardware and emphasizes on white-box gateway so that functions can be pre-configured and optimized for purpose-oriented applications.

By leveraging our expertise in network security and edge cloud computing, Lanner Whitebox Solutions™ provide a truly open network platforms to work compatibly with client specifications, and even zero-touch provisioning for customer applications.

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.

- High Core Count Intel Processor
- DPDK Packet Acceleration
- SR-IOV Improved Virtualized Performance
- Intel QAT Cryptographic Acceleration

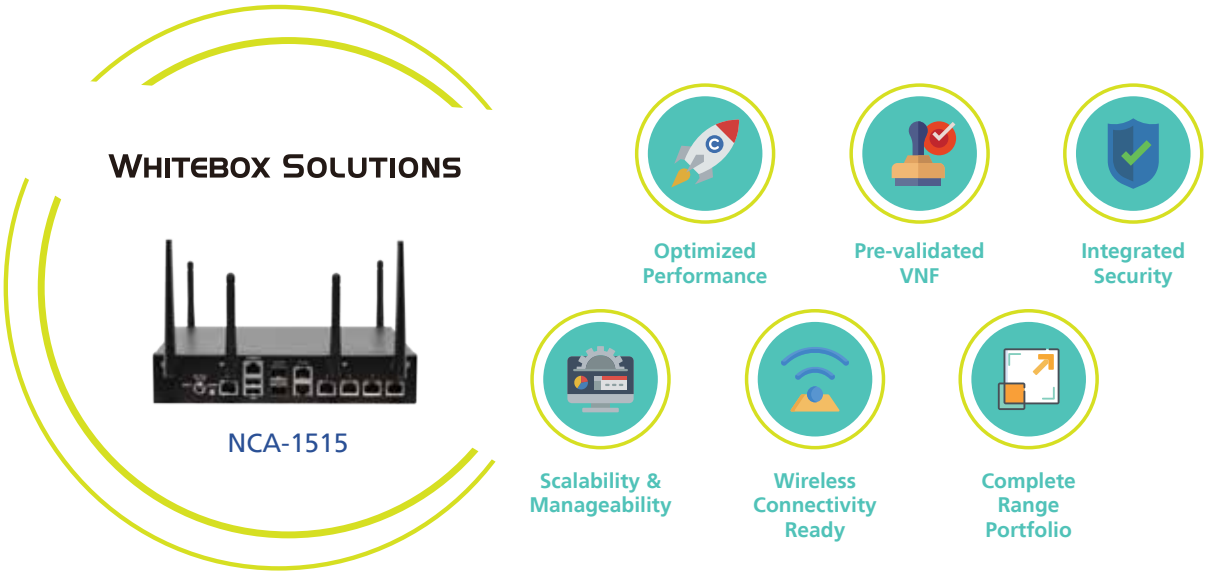
Whitebox uCPE Solution Overview

The global leader in White-box uCPE

Lanner uCPE Whitebox Solutions™ has won recognition from leading SD-WAN vendors. According to the IHS Markit report on "Data Center Network Equipment Market Tracker" released in October 2019, nine of the top sixteen SD-WAN players have adopted Lanner's uCPE/vCPE hardware solutions for its high level of reliability and interoperability. Lanner Whitebox Solutions™ powered by the high core-count x86 processors offer the performance boost to run compute-intensive VNFs for multi-vendor SD-WAN topology.

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.



Validations

verizon

Verizon's enhanced uCPE program will run on Lanner's uCPE platform and integrate seamlessly with existing Virtual Network Service (VNS) on the Verizon global network.

intel select solution

Lanner vCPE platforms has been validated by the Intel Select Solution for uCPE with ADVA Ensemble Connector and CentOS.

Security Package

Security Inside Out

Lanner can be counted on for offering hardware solutions built with the most advanced hardware-based and hardware-assisted security measures and enhancements. These added benefits and values include hardware security (i.e. TPM), security acceleration (i.e. Intel® QAT), BIOS security (i.e. BootGuard), Intel® SGX, ISO 27001:2013, secure BMC and more.

Security Acceleration

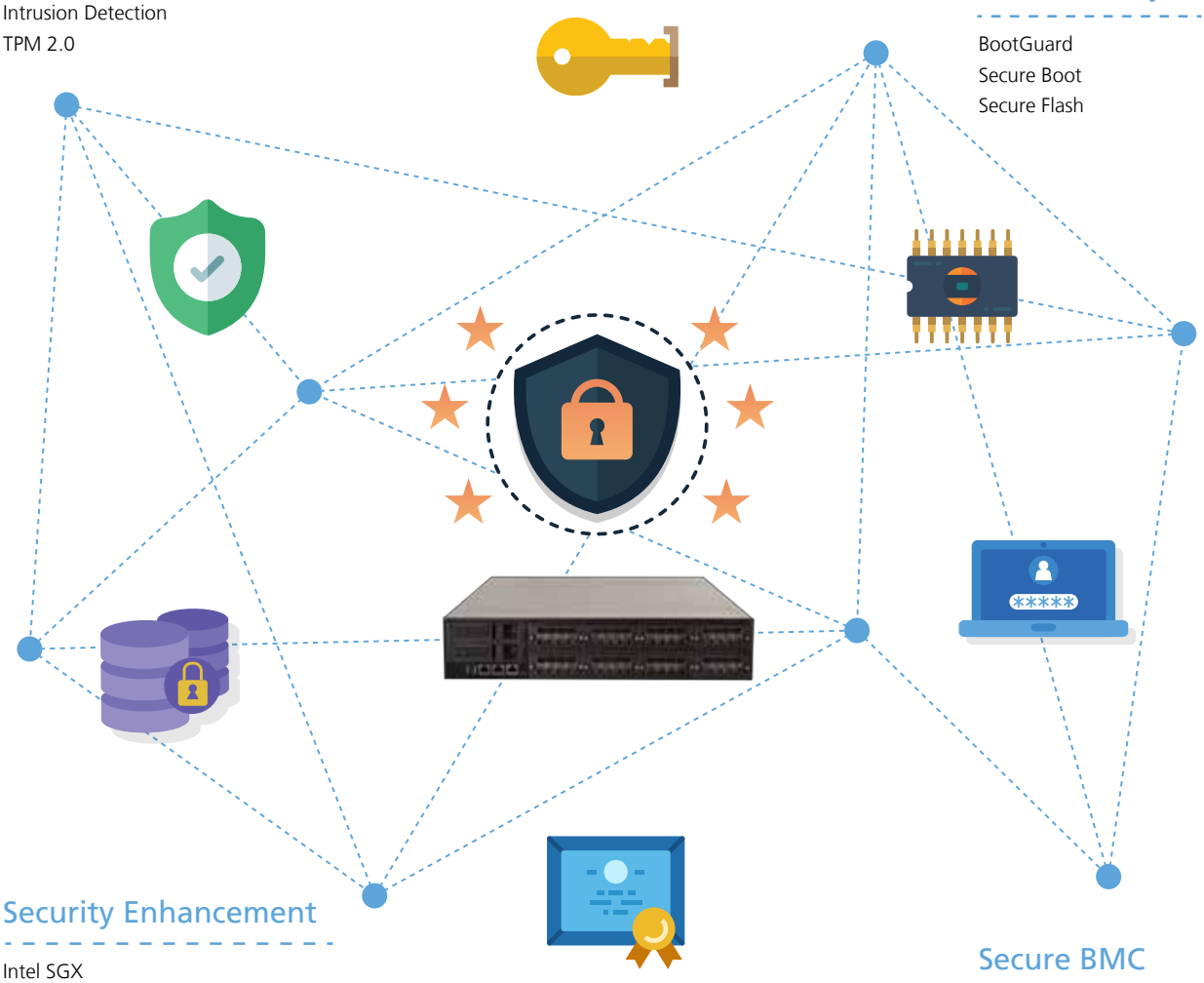
Intel QAT
Marvell Nitrox Security Processor
AMD Crypto Co-Processor
Mellanox Innova™ IPsec

Hardware Security

FIPS Compliant
Kensington Lock
Intrusion Detection
TPM 2.0

BIOS Security

BootGuard
Secure Boot
Secure Flash



Security Enhancement

Intel SGX
Intel SECL-DC
Intel SDO
AMD SME
AMD SEV

ISO 27001:2013

Certified
Information Security
Management

Secure BMC

Secure Access Control
Enhanced 2048-bit SSL

Lanner Global Services

Global Order Fulfillment and RMA

Worldwide Offices and RMA Centers

With our presence in various continents, we are able to serve our clients worldwide.

A Complete Service

After we have designed and manufactured your products, we install the required software and ship directly to your customers in your branded packages. Drop shipments can be arranged from our logistics centers worldwide.

Our service allows you to focus on your core competency of software development for the information security industry. We take care of the hardware design, manufacturing, logistics and service. That's our core competency.

Quality Control

Lanner's strict and ISO 9001-certified quality testing procedures have been adjusted to comply with standards. Also, as part of our green management plan, initiated early 2006, all Lanner products meet RoHS certification requirements.

Logistics

Successful logistics are reinforced by efficient procedures. Lanner clients' orders can be tracked through the production process by specific numbers allowing for routine project updates. Order traceability can guarantee consistency and quality.

Technical Support

Lanner provides full RMA service and technical support to fulfill customer service. For the systems built with Intel® platforms, we offer up to 7-year lifecycle support. Longer lifecycle support can also be arranged by jointly planned inventories.

uCPE/SD-WAN Ecosystem and Partnerships

Accelerate your Deployment with Pre-validated SDN/NFV Solutions

ADVA OPTICAL NETWORKING

ADVA's Ensemble Connector provides the network OS layer for NFV framework on the Whitebox Solutions uCPE Platforms

VERSA NETWORKS

Whitebox Solution uCPE has been tested by Versa Networks' highly-flexible NFV-based SD-WAN and SD-Security software

128 TECHNOLOGY

Prevalidated with 128T Networking Platform that includes a session-oriented, application-aware platform with native load balancing and security

SILVER PEAK

Offer a fully integrated solution that combines high-performance SD-WAN, WAN optimization, routing and a stateful firewall

ENEA

Enea NFV Access is a lightweight virtualization software platform uniquely designed for deployment on edge devices at customer premise

NETELASTIC

Delivers carrier vBNG solutions optimized for network scalability, performance, security, and operator efficiency

WIND RIVER

The Wind River Titanium Cloud is a fully integrated NFV infrastructure software platform with six nines reliability for telecom networks

EKINOPS

The Open Virtualization Platform software dramatically simplifies the creation, management and delivery of NFV-based services and SD-WAN

TREND MICRO

Designed for carrier-grade NFV environment, Trend Micro VNFS provides security protections, such as intrusion prevention and web security.

ACCEDIAN

Accedian SkyLIGHT extends virtualized instrumentation layer capabilities with service assurance, monitoring of bandwidth usage, service activation testing, and network fault isolation.

EXFO

Providing full visibility and control from Layer 2 through Layer 7 and from the network core to the network edge network with carrier-class reliability and a distributed architecture

BRAIN4NET

B4N SwitchOS enables feature-rich SD-WAN by supporting the complete set of OpenFlow 1.3.4 features, flexible pipelines and value-added services beyond the industry specifications.

ARICENT

Aricent's cloud-native SD-WAN virtual network function (VNF) supports containerized, low-footprint workloads for cost effective uCPE deployments

added services beyond the industry specifications.

NEC NETCRACKER

The end-to-end service and network orchestration from Netcracker provides the framework to manage services dynamically

TELCO SYSTEMS

Telco Systems' NFVTime comes with a broad portfolio of tested and certified VNFs, including SD-WAN, vRouter, vFirewall, vProbe and vSecurity

CREANORD

Creanord aims to assist carriers and service providers with a comprehensive solution for advanced, segmented and distributed L2 to L7 Performance Assurance in Metro and Access networks

NACXWAN

nacXwan provides full-fledged SD-WAN as a Service solutions, featuring routing, UTM security, application QoS and cloud-based orchestration, all in a compact network platform

UBIQUBE

UBiqube's MSActivator™ is the industry leading Integrated Automation Platform. Its highly abstracted modelling and development interfaces makes it easy to integrate VNFs from any vendor and any domain

Ecosystem Partners

Michael Heffner

Vice president PLM, Ensemble division

"While NFV enables the disaggregation of hardware and software, it is important to maintain coordination between hardware and software components to ensure that the solution is reliable, easy to deploy and end user requirements are met. By combining the market leading capabilities of ADVA and Lanner, we are enabling CSPs to transition to a new more efficient business model" said Mike Heffner, VP PLM Ensemble.

Patrick Ho

Technical Manager, APAC/GC

Lanner and Versa Networks have tested and validated an integrated solution that combines Lanner's compact virtual CPE equipment and Versa Networks' highly-flexible NFV-based SD-WAN and SD-Security software. The joint solution enables service providers to centrally and cost-effectively manage a truly NFV-based and software-defined WAN at their network customers' sites, instead of the traditional investment in proprietary hardware and hands-on management. The integration of Versa's NFV-based architecture and Lanner's hardware vCPE platform delivers flexibility and cost advantages for creating agile and profitable managed services.

Kaz Kuroda

Managing Director, APAC

"Our partnership with Lanner enables us to be a problem solver for today's network administrators who are navigating management and operational challenges when deploying universal CPEs," said Kaz Kuroda, managing director, APAC at 128 Technology. "Joining forces at this event gives us another opportunity to showcase how a session-oriented, application-aware universal CPE platform with native load balancing and security is the foundation needed for all VNF deployments."

Derek Granath

VP, Product and Technical Marketing at Silver Peak

"It's time to think outside the router and move to a business-driven SD-WAN. Adoption of cloud services has driven enterprises to re-think WAN architecture. Traditional router-centric WANs can't keep pace. A business-driven SD-WAN provides secure direct branch connections to SaaS/IaaS across the internet, increasing performance. Integrating SD-WAN, WAN optimization, routing and security in one unified platform simplifies WAN architecture, dramatically increasing operational efficiency."

Ecosystem Partners

ADRIAN LEUFVÉN,
Senior Vice President
OS Business Unit, ENEA

"Operators and enterprises are looking for alternatives to traditional network appliances because they no longer want complex, inflexible, and costly solutions," said Adrian Leufvén SVP of Enea's OS Business Unit. "We see a shift to solutions based on white box hardware and open virtualization software because that is the most flexible and cost-efficient combination. Together with Lanner, we now address this market with an optimized offering."

Dr. Weixiao Liu,
netElastic's CEO

"NFV software and white box servers are continuing to replace expensive and inflexible legacy network appliances," said Weixiao Liu, netElastic's CEO. "The combination of Lanner's true white box solutions and netElastic's industry-leading NFV software will help service providers disaggregate their networks for greater flexibility, scalability, and cost savings."

Philippe Moulin, Chief
Operating Officer
OneAccess at Ekinops.

"For network virtualization to truly succeed, flexibility and openness are critical. As a long-time champion in NFV, these principles have driven the innovation of the OneAccess brand, leading to the creation of our cornerstone OVP virtualization platform," comments Philippe Moulin, Chief Operating Officer OneAccess at Ekinops. "Our partnership with Lanner illustrates how great hardware and software can combine to ease the pain of VNF management and service-chaining, empowering CSPs to realize simple, manageable NFV."

Patrick Ostiguy, CEO,
Accedian

"SkyLIGHT has already been adopted by more than a dozen tier one mobile network operators who need our solution to assure their virtualized networks. Enterprise services are also undergoing radical virtualization and the service providers that support them need performance assurance solutions to match," said Patrick Ostiguy, CEO, Accedian. "Our partnership with Lanner will ensure that its many customers that are already building virtualized services, or those that are planning to do so, will have immediate access to the world's first fully-virtualized network performance assurance solution."

uCPE Appliances- XS, S, M, L

Feature	Description	LUNA-D125	NCA-1020	NCA-1510	NCA-1513
Form Factor		Desktop	Fanless Desktop	Fanless Desktop	Desktop
Platform	Processor Options	Intel® Atom™ C2316 (Rangeley)	Intel® Celeron® N3010 (Braswell)	Intel® Atom™ C3000 (Denverton)	Intel® Atom® C3000 (Denverton)
	CPU Socket	onboard	onboard	onboard	onboard
	Chipset	SoC	SoC	SoC	SoC
	Security Acceleration	Intel QuickAssist Technology	N/A	Intel QuickAssist Technology	Intel QuickAssist Technology
BIOS		AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology	DDR3L 1333 MHz Non-ECC	DDR3L 1600 MHz UDIMM	DDR4 2400/2133/1866 MHz ECC/Non-ECC SODIMM (By SKU)	DDR4 2133/1866 MHz ECC/Non-ECC SODIMM (By SKU)
	Max. Capacity	8 GB, default capacity 2GB	8 GB	16 GB	16 GB
	Socket	1 x 204-pin SODIMM	1 x 204-pin SODIMM	1 x 260-pin SODIMM	1 x 260-pin SODIMM
Networking	Ethernet Ports	2 x GbE RJ45 Marvell 88E1514 2x Gbe RJ-45 Intel i211-AT	3 x RJ45 GbE Intel® i211	4 x GbE RJ45 Intel® SoC Integrated MAC 2 x GbE RJ45 or SFP Intel® i210	4 x GbE RJ45 Marvell 88E1543 2x GbE RJ-45 Intel i210-AT or 2x GbE SFP Intel i210-IS (By SKU)
	Bypass	N/A	1 pair Gen3	1 pair Gen3 (By SKU)	2 pairs Gen3 (By SKU)
	NIC Module Slot	N/A	N/A	N/A	N/A
LOM	I/O Interface	N/A	N/A	N/A	N/A
	OPMA Slot	N/A	N/A	N/A	N/A
I/O Interface	Reset Button	1	1	1	1
	LED	Power/Status/Storage	Power LED on power button	Power/Status/Storage	Power/Status/Storage
	Power Button	1	1	1	1
	Console	1 x RJ-45	1 x RJ45	1 x Mini USB	1 x RJ-45
	USB	2 x USB 2.0	1 x USB 2.0, 1 x USB 3.0	2 x USB 2.0	2 x USB 3.0
	LCD Module	N/A	N/A	N/A	N/A
	Display	N/A	1 x HDMI	N/A	N/A
	Power Input	1 x DC Jack	1 x DC Jack	1 x DC Jack	1 x DC Jack
Storage	HDD/SSD Support	N/A	1 x 2.5" Bay - SSD Only	1 x 2.5" Bay (Optional)	1 x 2.5" Internal (Optional)
	Onboard Storage	1x NAND Flash 8G onboard 1 x M.2 2242 , B Key	1 x mSATA mini	1 x EMMC 8GB	1 x EMMC 8GB, 1 x M.2-2242/2280, B Key
Expansion	PCIe	N/A	N/A	N/A	N/A
	mini-PCIe	1 x Mini-PCIe (PCIe) 1 x M.2 3042 (PCIe/USB 2.0) 1 x Nano SIM	1 x Mini-PCIe (PCIe/USB2.0)	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 3042 (USB3.0) 1 x Nano SIM
Miscellaneous	Watchdog	Yes	Yes	Yes	Yes
	Internal RTC with Li Battery	Yes	Yes	Yes	Yes
	TPM	Yes	Yes (Optional)	Yes	Yes
Cooling	Processor	Passisve CPU heatsink	Passive CPU heatsink	Passive CPU heatsink	Passive CPU Heatsink
	System	Fanless	Fanless	Fanless	1 x Cooling Fan w/ Smart Fan
Environmental Parameters	Temperature	0~40°C Operating -20~70°C Non-Operating	0~40°C Operating -20~70°C Non-Operating	0~50°C Operating (SKU A/B/C) 0~40°C Operating (SKU D) -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	5~90% Operating 5~95% Non-Operating
System Dimensions	(WxHxD)	185 x 44 x 137 mm	137 x 36 x 120 mm	231 x 44 x 200 mm	231 x 44 x 200 mm
	Weight	1 kg	0.5 kg	1.2 kg	1.2 kg
Package Dimensions	(WxHxD)	312 x 280 x 140 mm	426 x 252 x 282 mm	325 x 305 x 120 mm	358 x 290 x 135 mm
	Weight	1.3 kg	8.5 kg (10 in 1)	2.2 kg	2.75 kg
Power	Type / Watts	12V 3A 36W Power Adapter	12V 3A 36W Power Adapter	36W or 60W Power Adapter	40W power adapter
	Input	AC 100~240V @50~60 Hz	AC 100~240V @50~60 Hz	AC 100~240V @50~60 Hz	AC 100~240V @50~60 Hz
Approvals and Compliance		RoHS, CE/FCC Class A, UL	RoHS, CE/FCC Class B	RoHS, CE/FCC Class B, UL	RoHS, CE/FCC Class B, UL




NCA-1515	NCA-1516 NEW	NCA-2510/NCA-2512	NCA-4010/NCA-4012
Desktop	Desktop	1U 19" Rackmount	1U 19" Rackmount
Intel® Atom® C3000 (Denverton)	Intel® Xeon® D-1500 (Broadwell-DE NS)	Intel® Atom™ C3000, 8~16 Cores (Denverton)	Intel® Xeon® D-1500 4~16 Cores (Broadwell-DE)
onboard	onboard	onboard	onboard
SoC	SoC	SoC	SoC
Intel QuickAssist Technology	Intel® QuickAssist Technology	Intel® QuickAssist Technology	N/A
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 2133MHz ECC/Non-ECC RDIMM	DDR4 2400MHz ECC or non-ECC UDIMM	DDR4 2400MHz REG, ECC or non-ECC UDIMM
32 GB	128 GB	32GB	32GB
2 x 260-pin SODIMM	4 x 288-pin DIMM	4 x 288pin DIMM	2 x 288pin DIMM
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)	6 x GbE RJ45 Intel® i350-AM4 2 x SFP Intel® i350-AM4 (By SKU) 2 x SFP+ SoC Integrated MAC (By SKU)	1 x GbE RJ45 Intel® i210 4 x GbE RJ-45 Intel® i350-AM4 4 SFP+ Intel® Denverton Integrated (By SKU)	8 x GbE RJ45 Intel® i210 8 x GbE RJ45 Intel® i350-AM4 (By SKU) 2 x 10G SFP+ Broadwell-DE SOC (By SKU)
1 pair Gen3 (By SKU)	1 pair Gen3 (By SKU)	2 pairs Gen3 (By SKU)	3 pairs Gen3 (By SKU)
N/A	N/A	1	1
1 x RJ45 (By SKU)	1 x RJ45	1 x RJ45 (By SKU)	1 x RJ45 (By Project) *Share with ETH0
Yes	IPMI Onboard (By SKU)	Yes (By SKU)	Yes (By SKU)
1	1	1	1
Power/Status/Storage	Power/Status/Storage	Power/Status/Storage	Power/Status/Storage
1	1	1 x ATX Power switch	1 x ATX Power switch
1 x RJ-45	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 2.0	2 x USB 2.0
N/A	N/A	2x20 character LCM 4 x keypads	2x20 character LCM 4 x keypads
N/A	N/A	From OPMA slot (Optional)	From OPMA slot (By Project)
1 x DC Jack	2 x DC Jack	AC power inlet on PSU	AC power inlet on PSU
1 x 2.5" Bay (Optional)	1 x 2.5" Bay (Optional)	2 x 2.5" bays	2 x 2.5" bays
1 x EMMC 8GB	1 x SATADOM (Optional)	1 x mSATA	1 x mSATA
N/A	N/A	1 x PCI-E*8 HH/HL (Optional)	1 x PCI-E*8 FH/HL (Optional)
2 x Mini-PCIe (PCIe/USB2.0) 1 x M.2 2242 B Key (USB3.0) 2 x Nano SIM for M.2	2 x Mini-PCIe Half Size (PCIe/USB2.0) 1 x Nano SIM Slot	N/A	N/A
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes (optional)	Yes (optional)
Passive CPU Heatsink	Passive CPU heatsink	Passive CPU heatsink	Passive CPU heatsink
1 x Cooling Fan w/ Smart Fan	3 x cooling fans	2 x cooling fans with smart fan	2 x cooling fans with smart fan
0~40°C Operating -20~70°C Non-Operating	0~50°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
231 x 44 x 200 mm	275 x 44 x 310 mm	438 x 321 x 44 mm / 438 x 431 x 44 mm	438 x 321 x 44 mm / 438 x 431 x 44 mm
1.2 kg	3 kg	7 kg	7.5 kg
358 x 290 x 135 mm	478 x 359 x 163 mm	540 x 500 x 230 mm / 582 x 548 x 182 mm	540 x 500 x 230 mm / 582 x 548 x 182 mm
2.75 kg	5 kg	8 kg	8.5 kg
36W or 60W Power Adapter (By SKU)	90W Power Adapter (Optional 1+1)	220W ATX Single PSU/300W Redundant PSU	220W ATX Single PSU/300W Redundant PSU
AC 100~240V @50~60 Hz	AC 100~240V @50~60 Hz	AC 90~264V @47~63Hz	AC 90~264V @47~63Hz
RoHS, CE/FCC Class B, UL VCCI, CCC, PTCRB, ODI	RoHS, CE/FCC Class A, UL	RoHS, CE/FCC Class A, UL	RoHS, CE/FCC Class A, UL

uCPE Appliances - Wide Temp., L & XL

Feature	Description	NCR-1510 NEW	NCR-1567
Form Factor		Fanless Desktop	Fanless Desktop, IP67
Platform	Processor Options	Intel® Atom™ C3308/C3508/C3708 (Denverton)	Intel® Atom™ C3308/C3508/C3708 (Denverton)
	CPU Socket	onboard	onboard
	Chipset	SoC	SoC
	Security Acceleration	Intel® QuickAssist Technology	Intel® QuickAssist Technology
BIOS		AMI SPI Flash BIOS	AMI SPI Flash BIOS
System Memory	Technology	DDR4 2400MHz ECC/Non-ECC	DDR4 2400MHz ECC/Non-ECC
	Max. Capacity	16 GB	16 GB
	Socket	2 x 260-pin SODIMM (By SKU)	2 x 260-pin SODIMM (By SKU)
Networking	Ethernet Ports	6 x GbE RJ45 or 4 x RJ45 & 2 x GbE SFP (By SKU)	6 x GbE RJ45 or 4 x RJ45 & 2 x GbE SFP (By SKU)
	Bypass	1 pair Gen3	1 pair Gen3
	NIC Module Slot	N/A	N/A
LOM	I/O Interface	N/A	N/A
	OPMA Slot	N/A	N/A
I/O Interface	Reset Button	1	1
	LED	Power/Status/Storage	Power/Status/Storage
	Power Button	1	1
	Console	1 x Mini USB	1 x Mini USB
	USB	2 x USB 3.0 (By SKU)	2 x USB 3.0 (By SKU)
	LCD Module	N/A	N/A
	Display	N/A	N/A
	Power Input	1 x DC Jack	1 x DC Jack
Storage	HDD/SSD Support	1 x 2.5" Bay (Optional)	1 x 2.5" Bay (Optional)
	Onboard Storage	1 x M.2 2242, 1 x SATA III	1 x M.2 2242, 1 x SATA III
Expansion	PCIe	N/A	N/A
	mini-PCIe	1 x Mini-PCIe (PCIe/USB2.0)	4 x LTE expansion modules
Miscellaneous	Watchdog	Yes	Yes
	Internal RTC with Li Battery	Yes	Yes
	TPM	Yes	Yes
Cooling	Processor	Passive CPU heatsink	Passive CPU heatsink
	System	Fanless	Fanless
Environmental Parameters	Temperature	-40~70°C Operating (SKU A/B) -40~60°C Operating (SKU C)	-40~70°C Operating (SKU A/B) -40~60°C Operating (SKU C)
	Humidity (RH)	5~90% Operating 5~95%, Non-Operating	5~90% Operating 5~95%, Non-Operating
System Dimensions	(WxDxH)	310 x 44 x 240 mm	310 x 44 x 240 mm
	Weight	TBD	TBD
Package Dimensions	(WxDxH)	TBD	TBD
	Weight	TBD	TBD
Power	Type / Watts	60W Power Adapter	60W Power Adapter
	Input	9~54 VDC	9~54 VDC
Approvals and Compliance		RoHS, CE/FCC Class A	RoHS, CE/FCC Class A

NCA-4025	NCA-5520	NCA-5710
1U 19" Rackmount	1U 19" Rackmount	1U 19" Rackmount
Intel® Xeon® D2100 8~16 Cores (Skylake-D)	Intel® Xeon® Processor Scalable Family (Skylake/Cascade Lake-SP)	Intel® Xeon® Processor Scalable Family (Skylake/Cascade Lake-SP)
1 x FCPGA	1 x LGA3647	2 x LGA3647
N/A	Intel® C621/626	Intel® C621/627
Intel® QuickAssist Technology (By SKU)	Intel® QuickAssist Technology (By SKU)	Intel® QuickAssist Technology (By SKU)
AMI SPI Flash BIOS	AMI SPI Flash BIOS	AMI SPI Flash BIOS
DDR4 2133/2400/2666MHz REG DIMM	DDR4 2666MHz REG DIMM	DDR4 2666MHz REG DIMM
128GB	384GB	384GB
4 x 288-pin DIMM	12 x 288pin DIMM	12 x 288pin DIMM
4xSFP+ from INPHI PHY CS4223 8x1Gbe RJ-45 from 2x I350-AM4	4 x GbE RJ45 or 4 x 10G SFP+ Lewisburg Internal MAC	4 x 10G SFP+ Lewisburg Internal MAC
Default without bypass, reserved 2 pairs Bypass	Depends on NIC Module Specifications	Depends on NIC Module Specifications
2	4	4
1 x RJ45	1 x RJ45 (Optional)	1 x RJ45 (Optional) *Share with ETH0
N/A, IPMI Chip Onboard	N/A, IPMI Chip Onboard	IPMI Chip Onboard (SKU B & C)
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 Mini USB	1 x RJ45, 1 x Mini USB
2 x USB 2.0	2 x USB 3.0	2 x USB 3.0
N/A	N/A (Optional)	N/A (Optional)
Internal Pin Header	Internal Pin Header	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 2.5" Internal	2 x 2.5" Internal
2 x SATA III connectors	1 x mSATA	1 x M.2
N/A	1 x PCI-E*16 FH/HL (Optional)	1 x PCI-E*16 FH/HL (Optional)
N/A	N/A	N/A
Yes	Yes	Yes
Yes	Yes	Yes
Yes (optional)	Yes (Optional)	Yes (Optional)
Passive CPU heatsink	Passive CPU heatsink	Passive CPU heatsink
4 x Individual Hot-swappable cooling fans	4 x Individual Hot-swappable cooling fans with smart fan	6 x Individual Hot-swappable 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 510 x 44 mm	438 x 650 x 43.5 mm	438 x 610 x 44 mm
TBD	16.5 kg	24 kg
TBD	790 x 600 x 220 mm	790 x 600 x 220 mm
TBD	18kg	18 kg
450W 1+1 AC to DC Redundant PSU	TBD	650W 1+1 ATX Redundant PSUs
AC 100~240V @47~63Hz	AC 100~240V @47~63Hz	AC 100~240V @47~63Hz
RoHS, CE/FCC Class A, UL	TBD	RoHS, CE/FCC Class A, UL

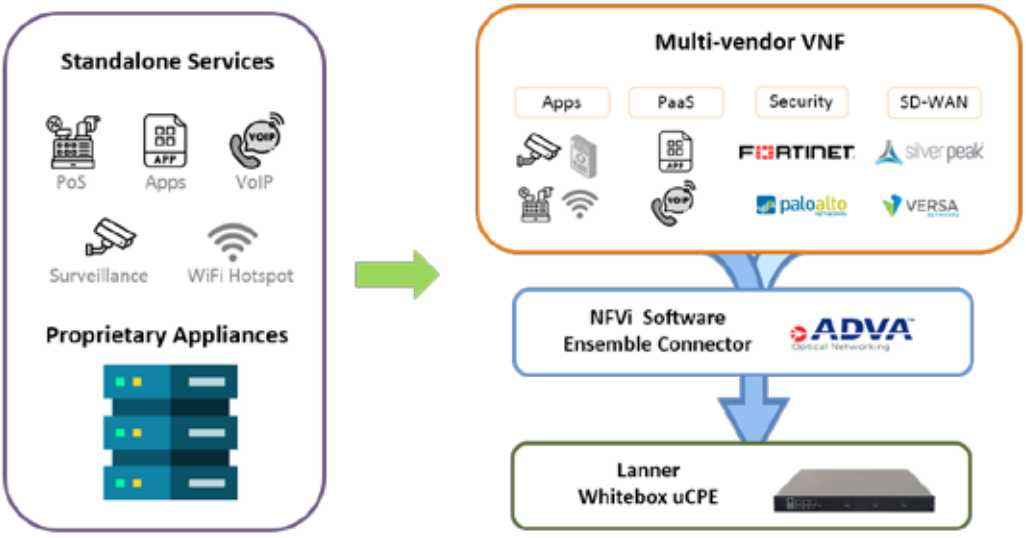
Consolidated uCPE for Multi-vendor Services in Retail

Retail chains all over the world have been investigating network transformation in order to improve customer experience and reduce overhead. Retail services today have evolved to be more and more diversified, including virtual fitting room in fast fashion trends, online demo video of suites in hotels and real estates, as well as real-time inventory checks for clerks and customers. All these newly innovated services need a better bandwidth, more cost-effective WAN architecture to meet customer satisfaction.

In addition, the software nature of SD-WAN allows prioritization of network resources and traffic, allowing retail owners to improve the bandwidth and performance for specific services or apps through the Internet or MPLS, wherever less traffic. Therefore, a white-box uCPE (universal customer premise equipment) with the following technological requirements would best fit the needs of retail SD-WAN deployments:

- High-Performance Processor
- High Availability – Redundant PSU
- Hardware-assisted Crypto Engine
- Highly Scalable Design
- Convergence

Converged uCPE for Multi-vendor SD-WAN in Retail



To accelerate deployments in retail environment, Lanner introduced its 1U rackmount white-box appliance NCA-5520, to converge multiple VNFs and enable ZTP (zero-touch provisioning). NCA-5520 possesses all the capabilities to enable pure-play virtualization and interoperability with multi-vendor software. In fact, this high-performance white-box appliance has been pre-validated as the NFVi hardware platform to run ADVA's consolidated network functions.

Lanner's NCA-5520 is powered by 2nd generation Intel Xeon Scalable Processor Family to offer high-performance, high-throughputs and crypto-acceleration. As a high-availability system, the white-box hardware platform is built with redundant power supply. Regarding scalability, NCA-5520 comes with 4 NIC module slots for connection with Lanner's F.A.S.T. (flexibility, adaptability, scalability and transformability) modules to expand functionality, connectivity or bandwidth, for instance, 100G Ethernet modules.

uCPE for High Availability SD-WAN in Retail

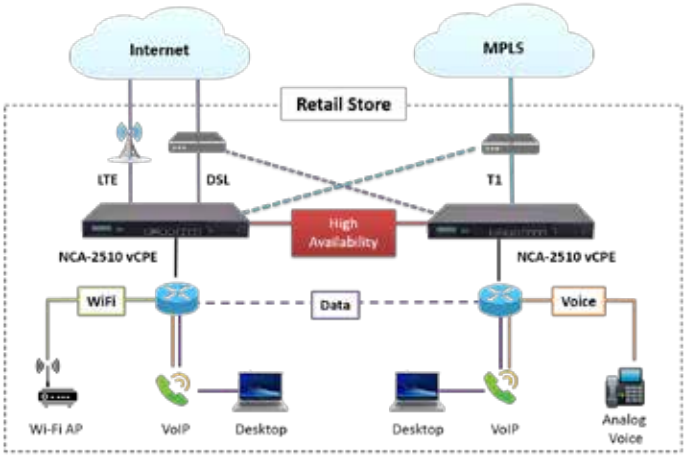
Retail chains today have shown growing reliance on advanced IT technologies to manage their inventories, transaction records and customer database. In particular, the global-scale retail chains may generate high-volume of transactions and customer data on a daily basis, and they have to manage inventory records in their warehouses worldwide. However, retail chains face the challenges in their network architecture. Traditionally, retailers rely on vendor-specific, disparate networking equipment and software, and therefore, OPEX have obviously increased when they expand in locations.

An US-based carrier as a system integrator and installer came to Lanner for SD-WAN hardware, and Lanner cooperated with its SD-WAN software partner 128 Technology to develop an integrated solution to the targeted customer, an auto parts retail chain with around 5,000 branches. Prior to this joint development, the retailer adopted routers from Cisco as WAN interconnect equipment. Once they have deployed the integrated SD-WAN solution from Lanner and 128 Technology, they can easily converge existing infrastructures such as MPLS service, cable modem, Wi-Fi, and 4G LTE through software-defined WAN, while ensuring constant uptimes, unified load-balancing and Zero-Touch Provisioning.

The key elements in this joint SD-WAN solution are as follows:

- High Availability
- NIC Slot for Expansion

High Availability SD-WAN for Retail Connectivity



In this partnership, Lanner Electronics Inc. introduced its retail SD-WAN solution NCA-2510 to enable virtualized WAN architecture so that customer's IT management can leverage third-party software to run their instructions.

Lanner's NCA-2510 is an open architecture, virtualization-optimized 1U rackmount white-box server for SD-WAN. NCA-2510 is powered by Intel® Atom™ C3958, C3758 or C3558 CPU (4 ~16 Cores) and 4x 288-pin DIMM DDR4 at 2,400MHz to efficiently execute load-balancing and network security. To optimize retail network connectivity, Lanner also offers NCS2-MINIPCIE02 module, a PTCRB-certified Wi-Fi/3G/4G/LTE NIC modular solution optimal for operators and device manufacturers located in regions where PTCRB interoperability/compatibility (cat-3 & cat-6) is a requirement.

FW/NCA-VERSA
Pre-configured white-boxes with Versa Networks FlexVNF

Overview

As the network landscape is changing in an unexpected pace, it is necessary to have the right hardware to run the core of SD-WAN. For instance, Lanner Electronics Inc. offers a wide range of vCPE and uCPE (universal customer premise equipments) pre-validated by leading SD-WAN vendors in the market, which saves deployment time regarding interoperability with mainstream platform software.

Versa VOS™ (formerly FlexVNF)

Versa VOS™ (formerly FlexVNF) is a multi-service, multi-tenant software platform built from ground up on cloud principles to deliver scale, segmentation, programmability and automation. It provides both networking and security functions in a single software along with service chaining capabilities.

Lanner Model		FW-7551A-VS1	FW-7551E-VS1	FW-7551SED-VS1	FW-7551SEB-VS1	FW-7551SEC-VS1
Versa Model		Versa 100	Versa 110	Versa 110-NW	Versa 110-NW	Versa 120-NW
Form Factor		Tabletop	Tabletop	Tabletop	Tabletop	Tabletop
Processor System	Processor	Intel® Atom™ C2358	Intel® Atom™ C2558	Intel® Atom™ C2558	Intel® Atom™ C2558	Intel® Atom™ C2758
	Core Number	2 Cores	4 Cores	4 Cores	4 Cores	8 Cores
	Frequency					
	Chipset					
Memory		8G DDR3 ECC SO-DIMM	8G DDR3 ECC SO-DIMM	8G DDR3 ECC SO-DIMM	8G DDR3 ECC SO-DIMM	16G DDR3 ECC SO-DIMM
Storage		64G 2.5" SSD	64G 2.5" SSD	64G 2.5" SSD	64G 2.5" SSD	128G 2.5" SSD
Ethernet		6x GbE RJ45 LAN ports	6x GbE RJ45 LAN	6x GbE RJ45 LAN	4x GbE RJ45 LAN + 2x SFP	4x GbE RJ45 LAN + 2x SFP
WWAN(4G LTE)	Specification					
	SIM Slot					
	WLAN					
Expansion	PCIe Expansion Slot					
	NIC slot					
BMC						
TPM		TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2
Power Supply		External 60W adaptor	External 60W adaptor	External 60W adaptor	External 60W adaptor	External 60W adaptor
Power Supply Redundancy						
Rack mount kit						
Slide Rail						
Power Cord		US / EU / India	US / EU / India	US / EU / India	US / EU / India	US / EU / India

FW/NCA-VERSA(Cont.)

Lanner Model		NCA-1515B-VS1	NCA-1515B-VS2	NCA-1515B-VS3	NCA-1515A-VS1	NCA-1515A-VS2	NCA-1515A-VS3
Versa Model		Versa 210	Versa 210	Versa 210	Versa 220	Versa 220	Versa 220
Form Factor		Tabletop	Tabletop	Tabletop	Tabletop	Tabletop	Tabletop
Processor System	Processor	Intel® Atom™ C3558	Intel® Atom™ C3558	Intel® Atom™ C3558	Intel® Atom™ C3758	Intel® Atom™ C3758	Intel® Atom™ C3758
	Core Number	4 Cores	4 Cores	4 Cores	8 Cores	8 Cores	8 Cores
	Frequency	2.2 GHz	2.2 GHz	2.2 GHz	2.2 GHz	2.2 GHz	2.2 GHz
	Chipset						
Memory		8G DDR4 ECC SO-DIMM	8G DDR4 ECC SO-DIMM	8G DDR4 ECC SO-DIMM	16G DDR4 ECC SO-DIMM	16G DDR4 ECC SO-	16G DDR4 ECC SO-
Storage		64G M.2 SSD	64G M.2 SSD	64G M.2 SSD	128G M.2 SSD	128G M.2 SSD	128G M.2 SSD
Ethernet		6x GbE RJ45 LAN + 2x SFP	6x GbE RJ45 LAN +	6x GbE RJ45 LAN +	6x GbE RJ45 LAN + 2x SFP	6x GbE RJ45 LAN +	6x GbE RJ45 LAN +
WWAN (4G LTE)	Specification		Cat.6	Cat.6		Cat.6	Cat.6
	SIM Slot		2	2		2	2
WLAN							
Expansion	PCIe Expansion			IEEE 802.11 a/b/g/n/ac			IEEE 802.11 a/b/g/n/ac
	NIC slot						
	BMC						
TPM		TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2
Power Supply		External 60W adaptor	External 60W adaptor	External 60W adaptor	External 60W adaptor	External 60W adaptor	External 60W adaptor
Power Supply Redundancy							
Rack mount kit							
Slide Rail							
Power Cord		US / EU / India	US / EU / India	US / EU / India	US / EU / India	US / EU / India	US / EU / India

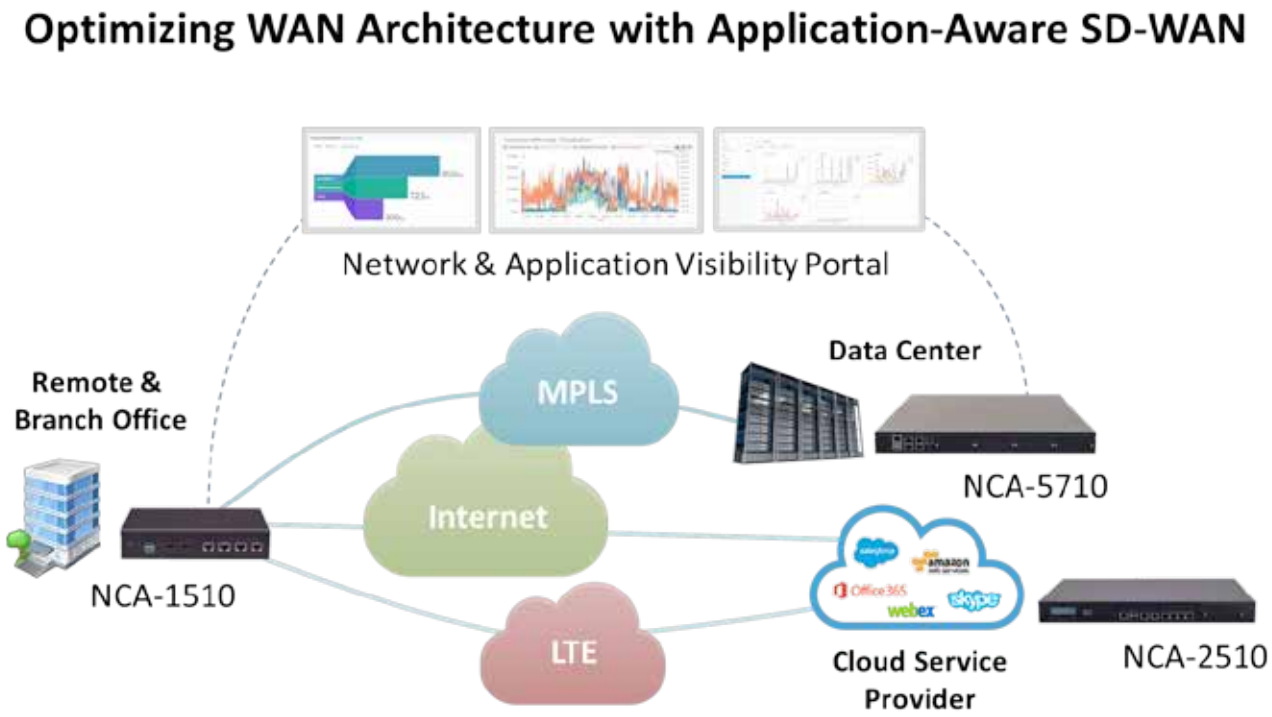
Lanner Model		NCA-4010X-VS2	NCA-4010D-VS1	NCA-4010Y-VS2	NCA-4010Y-VS3	NCA-5510A-VS1	NCA-5510A-VS4
Versa Model		Versa 800	Versa 810	Versa 810	Versa 810	Versa 1000	Versa 1000
Form Factor		Rackmount, 1XRU	Rackmount, 1XRU	Rackmount, 1XRU	Rackmount, 1XRU	Rackmount, 1XRU	Rackmount, 1XRU
Processor System	Processor	Intel® Xeon™ D-1528	Intel® Xeon™ D-1548	Intel® Xeon™ D-1548	Intel® Xeon™ D-1548	Intel® Xeon™ E5-2680	Intel® Xeon™ E5-2680
	Core Number	6 Cores	8 Cores	8 Cores	8 Cores	14 Cores	14 Cores
	Frequency						
	Chipset						
Memory		32G DDR4 ECC+REG DIMM	32G DDR4 ECC+REG DIMM	32G DDR4 ECC+REG DIMM	64G DDR4 ECC+REG DIMM	64G DDR4 ECC RDIMM	64G DDR4 ECC RDIMM
Storage		128G 2.5" SSD	256G 2.5" SSD	256G 2.5" SSD	256G 2.5" SSD	512G 2.5" SSD	512G 2.5" SSD
Ethernet		8x 1G RJ45 ports from i350 + 2x 10G SFP+	8x 1G RJ45 ports from i350 + 2x 10G SFP+	8x 1G RJ45 ports from i350 + 2x 10G SFP+	8x 1G RJ45 ports from i350 + 2x 10G SFP+	Slot1 NCS2-IGM428A for RJ45 port*4 Slot2 NCS2-IXM204A for SFP+ port*2SFP+	Slot1 NCS2-IGM806 for RJ45 port*8 Slot2/3 NCS2-IXM407A for SFP+ port*4
Expansion	PCIe Expansion						
	NIC slot						
	BMC						
TPM		TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2	TPM 1.2
Power Supply		Internal 220W PSU	Internal 220W PSU	Internal 220W PSU	Internal 220W PSU	Internal 300W PSU x2	Internal 300W PSU x2
Power Supply Redundancy							
Rack mount kit							
Slide Rail							
Power Cord		US / EU / India	US	US / EU / India	US / EU / India	US / EU / India	US / EU / India

Optimizing WAN Architecture with Application-Aware SD-WAN

As the business world has moved towards further digitalization, the competitiveness of enterprises heavily relies on application serviceability and network performance. In fact, it is the application awareness or even intelligence that drives SD-WAN to be more flexible than conventional WAN architecture in terms of visibility and control to set priority over the network. With application awareness, SD-WAN effectively reduces bandwidth burden and OPEX/CAPEX for IT management.

An industry leader in SD-WAN solutions cooperated with Lanner to jointly build up a revolutionized network platform. The collaboration aims to replace legacy WAN architecture with application-aware SD-WAN, that will simplify hybrid WAN and implement end-to-end security. The solution is integrated with both hardware and software factors:

- Application Prioritization
- Zero-Touch Provisioning
- Optimizing Existing Hybrid WAN
- Advanced LAN Bypass
- Redundant Power Supply & High Availability
- Onboard Intel® QuickAssist Technology



During the collaboration, Lanner supplied a wide range of SD-WAN hardware devices to meet various WAN optimization needs. For instance, Lanner's NCA-1510 is ideal for small branch office due to its compact form factor. For medium-sized WAN infrastructure, NCA-2510, an 1U rackmount white-box, offers virtualization optimization with needed hardware specifications for SD-WAN application awareness. For large-scale, multi-WAN architecture, NCA-5710, powered by dual Intel® Xeon® Processor Scalable Family, is the optimal solution for performance-demanding applications.

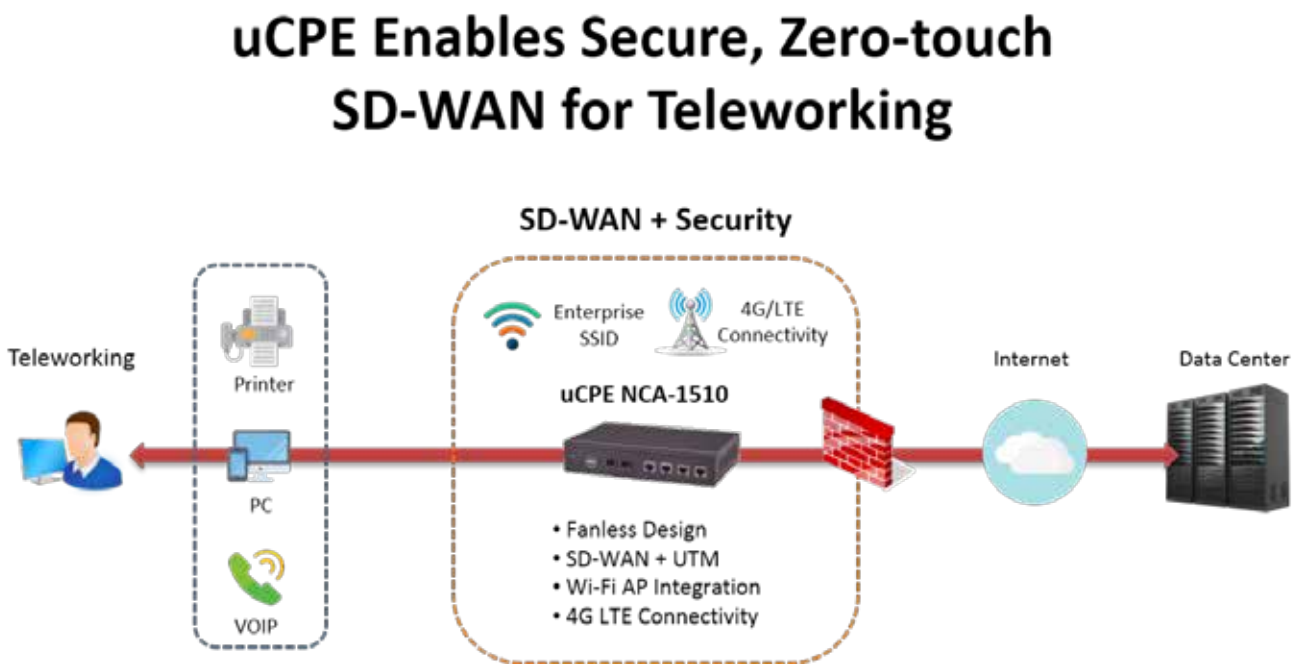
SD-WAN Mitigates Teleworking Challenge to Ensure Business Continuity

Since the outbreak of COVID-19 pandemic, many municipal and national governments have imposed lockdown policies, forcing their people to stay home. Companies with branches worldwide have already instructed their employees to work from home for a certain period of time. However, the cure of the pandemic is still under experiment without a definite release date, the challenges regarding working from in terms of connectivity, bandwidth and security to ensure business continuity will remain.

Indeed, the technological phenomenon of "work from home" (WFH) or "teleworking" presents a challenge for multi-site companies to ensure business continuity and productivity. Thus, they are investigating optimal and simplified solutions to mitigate the challenges with high QoS (quality of service) level in video conferencing, instant chat and other communication mediums. The answer is SD-WAN.

Lanner offers uCPE platforms that help service providers enable zero-touch SD-WAN solutions with pre-set security instructions. The solution covers the following technological features:

- SSL/IPSEC VPN pre-set for remote access
- Compatible with Integrated LTE
- Zero Touch Provisioning (ZTP)
- QoS in video/voice conferencing
- End-to-end Monitoring and Centralized Analytics



In this collaboration, Lanner presented its NCA-1510, a fanless SFF desktop security appliance designed for SME (small-and-medium enterprises) SD-WAN. NCA-1510 is powered by Intel® Atom® C3000 (codenamed Denverton) CPU, to deliver robustness and performance. For security, NCA-1510 is built in with Intel's QuickAssist Technology, offering cryptographic acceleration and commercial-grade LAN functions in a 231mm x 200mm x 44mm form factor. Besides, NCA-1510 can function as an uCPE network appliance for zero-touch provisioning at remote sites to support business continuity and teleworking. NCA-1515, another feature-rich desktop appliance from Lanner, shares most features with NCA-1510 and is design-ready for 5G Sub-6 and WiFi 6 (802.11ax).

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