Advantech Network Appliances

The Broadest Choice of x86 Platforms Designed to Transform Your Whitebox Networking Landscape

ADVANTECH

Enabling an Intelligent Planet

(intel) | IoT Solutions Alliance Premier

www.advantech.com/nc

Introduction

Towards a Software Defined Infrastructure

As information and communications technologies converge, accelerated by the virtualization of applications in the cloud and the consolidation of fixed function elements throughout the network, the ICT industry finds itself in the midst of a tectonic shift where new strategies, partnerships and business models are set to transform today's network infrastructure. A software defined, all-IP infrastructure that promises to be extremely agile, and infinitely reconfigurable is in the making. One that will open the doors to a whole new class of flexible on-demand services.

Enterprise Networking - First Mover Advantage

Transformation is happening much faster in the Enterprise market, as functions consolidate and are unified in universal CPE devices, enterprise transformation will accelerate, driven by gains in simplification, operational efficiency and flexibility through greater network elasticity. These are the design elements that Advantech network appliance focus on.

Strategic alliances with major processor and networking vendors to accelerate time to market for our customers

Network throughputs from 1Mbps to 100Gbps with the broadest range of network platforms based on x86 architecture

LANs & WANs
- WAN Optimization
- Network Monitoring

RJ45/ Copper

Network Security
- Firewall/ UTM
- IPS/IDS

1GbE

10GbE

40GbE

100GbE

2, 4, 8 ports
Per NMC

Network Monitoring

• Bandwidth Management
• DPI

Cyber Security

• Sandboxing
• Email & Spam

NFV & SDN

• SD-WAN
• vE-CPE

Fiber

SFP+

SFP +

Designed for Reliability

The platforms scale from cost-efficient and compact tabletop solutions to high performance 1U rackmount server designs and scalable 2U enterprise/data center level platforms, all these based on a single processor architecture from Intel® where individual systems can be easily expanded with new hardware options and with compatible product families.

Remote Update	Redundant Firmware	Advanced Hot Plug	Failsafe Update	Digital Inventory
Advanced LAN Bypass	Service-friendly Design	Chassis Intrusion Detection	Remote Monitoring & Control	

Components Selection

• Polymer and ceramic capacitors for high reliability and performance

• High-current & low-loss molding power chock for high stability and performance

• Low level contact resistance and heavy gold-plating connectors for high-current or high-speed requirements

• Digital PWM power solutions for precise power control and management

• PCB
  • 2 oz copper layers for heavy-duty power
  • Low-loss PCB materials for high-speed signals
  • Heavy gold-plating on gold-finger for reliability and performance

Design Flexibility

• Various memory technology, including UDIMM/RDIMM/LRDIMM/ NVDIMM

• Max CPU power and DIMM power for highest performance or optimized power

Quality Assurance

• De-rating check and review for critical environment and long lifetime

• Power protection for all hot-plug modules, including PSU, HDD, NMC, USB and Fan

• All power solutions with over-voltage and over-current protection

• Power solutions with temperature protection for critical application

Platforms

2U Appliance

1U Appliance

Tabletop Appliance

intel®

x86-based

Customization

- Different color/ID chassis and painting process silkscreen/mylar
- BIOS default setting
- DMI and FRU customization
- IPMI and LAN bypass customization
- DQA functionality testing
- QA and qualification environment testing
- Factory integration
- Board de-features by BOM option

Technologies

- Scalable x86 multi-core performance from Intel® Atom™ to Intel® Xeon® Processors
- Integrated HW acceleration (Intel® Quick Assist Technology (QAT))
- Support for DPDK
- 1GbE/10GbE/40GbE/100GbE fiber and copper Ethernet ports
- BIOS & firmware
- IPMI
- QuickStart Linux Image, Diagnostic tool
- 3rd party middleware

Value

Whole product life cycle ownership from in-house design and manufacturing to global logistics and support

Modular Design with High Flexibility

Advantech's modular approach reduces total cost of ownership and service cost via re-usability across the product range and multiple product generations. Offering a broad choice of Intel®processors, LAN access devices and accelerator silicon such as Intel® QuickAssist technology for SSL and IPsec encryption, The extreme configurability of Advantech FWA appliances gives customers the flexibility to match a wide range of deployment scenarios.

Advantech's Network Mezzanine Cards (NMCs)

- High density I/O modules for use in Advantech's network appliances.

- Wide choice of GbE, 10GbE, 40GbE and 100GbE modules supporting copper and fiber networking interfaces and 2.5" SATA/SAS/NVMe storage devices

- Optional LAN bypass and PoE for various applications

- PCIe interface: Dual PCIe x4, single PCIe x8 or dual PCIe x16 enable NMC support for optimization of performance, flexibility, throughput

- Field Replaceable Unit (FRU) data:

  - Allows NMCs to be identified by software (serial number, MAC address, model etc)

  - Simplifies configuration management, tracking and asset management

- Designer for Muti-core processing applications and optimized for virtual environments with support for technologies such VMDq, SR-IOV and DPDK.

- Leveraging best-in-class Intel® Ethernet controller technology, NMCs provide a well-known Ethernet Adapter experience and a maximum of software compatibility.

- The option of factory and field installation enables upselling opportunities and pay-as-you-grow concepts.

▎Power Supply Unit (PSU)

- Redundant, hot swapable power supplies units
- DC/AC power supply options

▎Tailored Branding, Packing & Logistics

- Mylar, logo, color
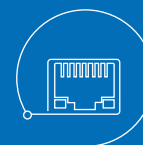- Branding options including chassis color, logo and front bezel design

▎Mounting Kits

- Slide rail for 1U/ 2U rackmount appliances
- Rack mount or wall mount options for tabletop appliances
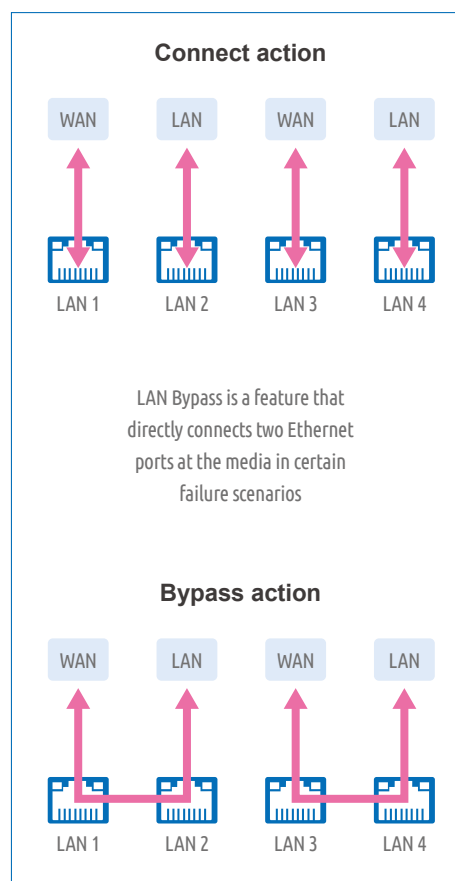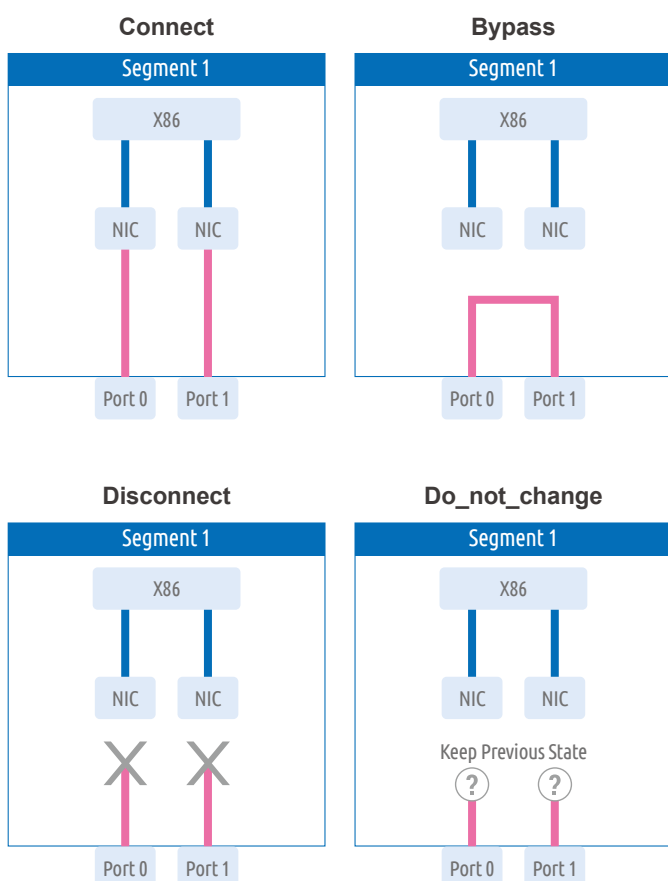
▎Optimized Storage

- Choice of 2.5" and 3.5" HDD/SSD SKUs
- NVMe support via NMC extension
- mSATA, m.2, mini PCIe, USB DOM, SATA, SAS or CF card for selected products.

LAN Bypass

Safeguard the continuity of your business critical services by eliminating single points of failure with LAN bypass. Advantech's advanced LAN Bypass feature guarantees uptime by preserving network connectivity and maintaining communications in case of power outage or appliance malfunction. When Bypass Mode is active, multiple interface pairs can be bridged on power failure and will resume normal functionality when power is restored.

• Better performance / lower latency over PCIe interfaces.

• Low latency and SW overhead for watchdog start and refresh.

• Multi instance support. Each instance can control its own bypass segment without resource conflict.

• All settings are segment independent including watchdog, event/ action relationship and LED indicator behavior.

• All settings are non-volatile and can be changed on demand.

• Multiple events can be detected: Power on, power off, reset, watchdog start, watchdog timeout, manual, button event 1, button event 2 and external trigger.

• All bypass segments in one server can be treated as a single bypass segment.

• Backward compatible and field side upgrade capability.

Connect

Segment 1

X86

NIC NIC

Port 0 Port 1

Bypass

Segment 1

X86

NIC NIC

Port 0 Port 1

Disconnect

Segment 1

X86

NIC NIC

X X

Port 0 Port 1

Do_not_change

Segment 1

X86

NIC NIC

Keep Previous State

? ?

Port 0 Port 1

Connect action

WAN LAN WAN LAN

LAN 1 LAN 2 LAN 3 LAN 4

LAN Bypass is a feature that directly connects two Ethernet ports at the media in certain failure scenarios

Bypass action

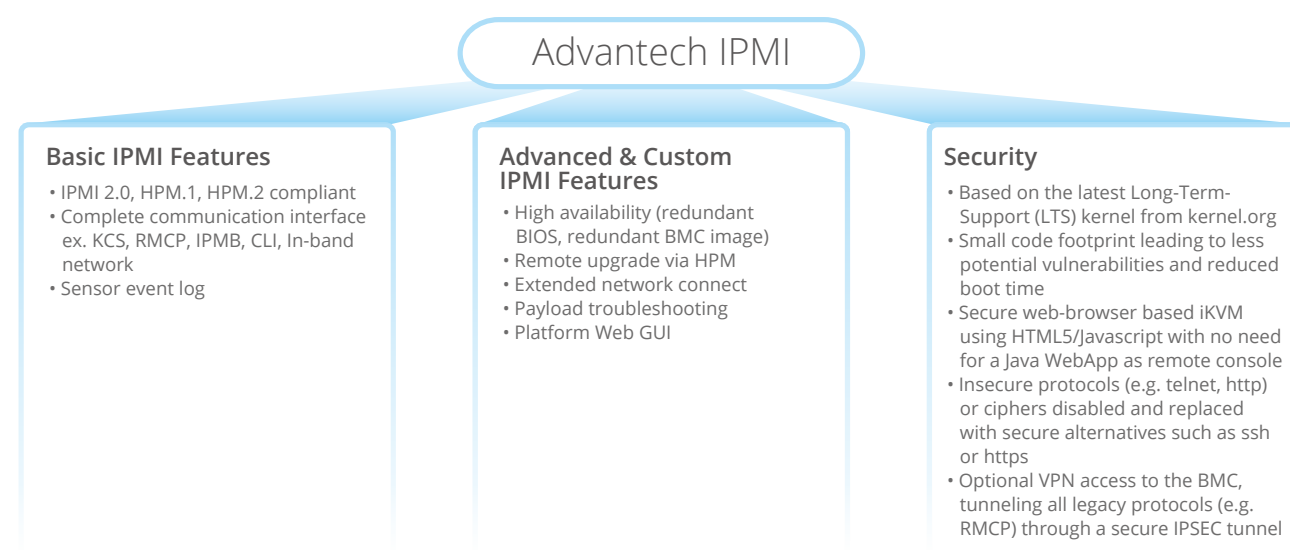WAN LAN WAN LAN

LAN 1 LAN 2 LAN 3 LAN 4

Added Value Beyond just Hardware Designs

Advantech ensures that our systems have outstanding stability secured by a world class design quality assurance process, and are enhanced by building in features which improve availability, serviceability and usability. Advanced platform features include redundant images and fail safe updates using a single industry standard protocol (HPM.1) which are built into Advantech's dedicated Carrier Grade BIOS and IPMI firmware.

Intelligent Platform Management Interface (IPMI)

Advantech IPMI

Basic IPMI Features
- IPMI 2.0, HPM.1, HPM.2 compliant
- Complete communication interface ex. KCS, RMCP, IPMB, CLI, In-band network
- Sensor event log

Advanced & Custom IPMI Features
- High availability (redundant BIOS, redundant BMC image)
- Remote upgrade via HPM
- Extended network connect
- Payload troubleshooting
- Platform Web GUI

Security
- Based on the latest Long-Term-Support (LTS) kernel from kernel.org
- Small code footprint leading to less potential vulnerabilities and reduced boot time
- Secure web-browser based iKVM using HTML5/Javascript with no need for a Java WebApp as remote console
- Insecure protocols (e.g. telnet, http) or ciphers disabled and replaced with secure alternatives such as ssh or https
- Optional VPN access to the BMC, tunneling all legacy protocols (e.g. RMCP) through a secure IPSEC tunnel

QuickStart Linux Image (QSL)

- CentOS 7 based start-up image (USB base)
- Features include:
  - Platform specific drivers (Intel® NIC, IPMI driver, etc.)
  - Advantech LAN bypass
  - LCD module control
  - Platform Management tool (ipmitool, lm-sensor...etc)
  - Offline diagnostics
  - DPDK & QAT

USB Image			Pre-installed on HDD/SSD (on request)		
Platform Tools	BIOS Update	LCD Module Control	DPDK pktgen	Intel QAT Openssl	Diagnostic Tools
	FRU Data Display	LAN Bypass Control	DPDK l2fwd	DPDK ipsecgw	
	Sensor / Health	Sierra QMI SDK	DPDK PMD	DUI	
	Platform mgmt. tools	TPM Sample	Intel QAT Sample	System Info	
Ethernet Drivers	TPM Drivers	SR-IOV Drivers	DPDK Drivers	QAT Drivers	HWM Drivers
CentOS 7 Linux					

Note: Ubuntu based start-up image for vCPE products.

Integration, Customization & Design Capabilities

Starting from commercial-off-the-shelf platforms, Advantech offers personalized products through a wide range of specialized services. All of our platforms are application-ready with branding options available including chassis color, logo and front bezel design. Customers can optimize Advantech FWA appliances to meet desired performance and functionality levels. In addition, solution providers can leverage our Customized COTS framework for semi-custom electronic or mechanical design as well as BIOS firmware strings or IDs. When the migration of proprietary IP to a new platform is essential, our Customized COTS framework helps bridge the gap between ODM and standard product to speed time to market.

Enabled by Advantech

Advantech Networks & Communications Group is at the core of network transformation, enabling the transition from fixed function, proprietary devices to open architecture Intel-based appliances, providing universal networking platforms and building blocks that will constitute the servers, gateways, firewalls, switches and routers of the future.

Ready Networking Platforms

Advantech enterprise networking solutions are based on the latest generation of platforms that have served key networking and cyber-security OEMs in large-scale re-branded deployments for more than a decade. Based on Intel architecture technology, and enhanced by Advantech design expertise, the FWA series brings greater reliability, availability and manageability to customers. The broad portfolio brings the performance, flexibility and modularity needed to rapidly meet many workload, connectivity, and acceleration needs at different performance levels.

Remote Evaluation Service

Advantech's Remote Evaluation Service (RES) is designed to help customers get ahead of the technology curve and rapidly evaluate next-generation applications and services on a wide range of networking platforms that can emulate different deployment scenarios at different network locations. We work together with leading silicon, middleware and NFV ecosystem partners so that you can:

Early evaluate and benchmark latest hardware and software technologies

Remotely perform functional and interoperability testing

Get an early start on development while saving resources, time and money

RES puts virtual control of your own test lab at your finger-tips. You no longer incur the costs of shipping heavy freight around the world, purchasing expensive test rigs or breaking your back installing equipment in a lab which you probably wouldn't sit in anyway. The systems we propose are pre-integrated application-ready platforms embedded in a qualified, dedicated, and secure network test environment. In addition, our NFV Test-Drive Portals build a full-stack NFVI environment where users can remotely evaluate VNF performance or interoperability for a particular use case.
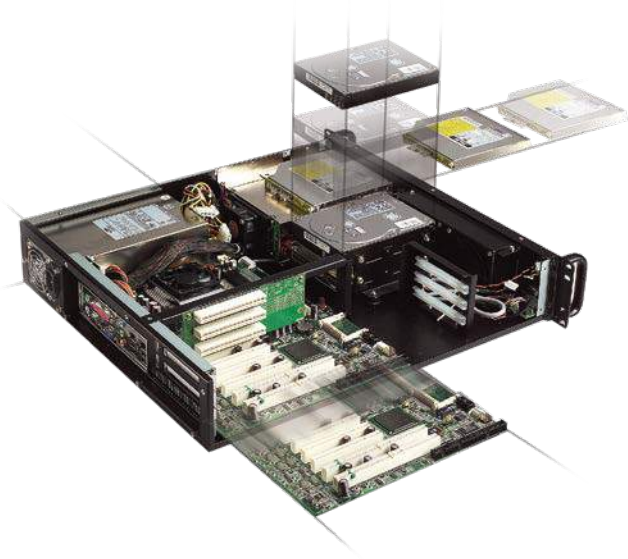
| Advantech Configure To Order Service (CTOS)

Advantech Configure To Order Services (CTOS) provides ultimate system configuration flexibility with web-based configuration tools, in-house manufacturing and Advantech global services. CTOS creates an easy-to-order online one-stop shop with online product & solution advisors.

Wide and Flexible System Solutions	2 Years Global Warranty	Meet Your Special Needs	Reliability & Safety of Quality Assurance
One-stop integrated solution application ready platform include bare-bone system, completed system, and integrated system solution	Carry 2 years global warranty covering system & peripherals integrated	Provide customized chassis assembly, testing services, packaging and labeling	ISO 9001:2000 certified, Run-In stress testing, Temp., Customer's test kit/equip., Customized testing/Run-in

Easy to Order, Smart Purchasing	Global Availability	Delivery with Local Access	OS Expertise
Configure your system on-line to meet your exact product specs based on standard and modular Advantech building blocks	Shared Global Sharepoint database. Globam eSOP for assembly lines. Barcode Traceability (SFIS DB) Special services on request.	Local assembly & product care with Advantech worldwide regional service centers	Microsoft OS, Embedded OS, Linux, Customer Supplied Software, Software Imaging & RAID, Setup/Server config., Activate/Register software

Choosing the Right Partners

As SDN and NFV rollouts continue to materialize, delivering network services and solutions requires a more concerted integration and interoperability between hardware and software elements from multiple suppliers. To be successful in this new environment, companies must cultivate a new class of partner ecosystem, one that helps customers plan on how to transition to SDN/NFV. A solid technology partner ecosystem has become paramount to both customer and vendor success.

Interoperability

To ensure functionality of business critical SDN/NFV solutions, Advantech has formed an Ecosystem Alliance Program that brings together industry leaders and innovators to foster technology teamwork, interoperability testing and solution development. This comprises a subset of Intel Network Builder ecosystem members, with whom Advantech is continuously active.

Faster Integration

Advantech works together with partners to supply proven product interoperability so that Communication Service Providers and OEMs can readily integrate tested combinations of hardware and software components with total confidence. In a fast paced market this allows them to evaluate and deliver innovative solutions more rapidly and respond more effectively to emerging customer needs.

Preparing Readily Available Business Solutions

Advantech's partner ecosystem is made up of leaders in each of their respective areas of expertise. Together, these companies provide all of the essential components for developing, verifying, integrating and building high performance products. We all collaborate to meet customers' application-specific needs by facilitating the transformation of leading-edge technologies into readily available business solutions.

Partnering for Remote Evaluation

Developers have an unprecedented choice of networking gear available when working with Advantech, which allows them to tap into the processing power of several CPU cores or several hundred. With connectivity to a wide range of 1, 10, 40 and 100GbE ports, the scale-out and service chaining of VNFs can be benchmarked with finer precision to identify platforms that are able to meet specific service level agreements.
The breadth of choice and sheer scalability of x86-based networking gear from Advantech offers a lot of flexibility for customers to test third party virtual functions, using Advantech's Remote Evaluation Services.
In the transition to NFV and virtual networking environments, telecom operators will need strong ecosystems and solid lab models like Advantech's to help solve performance challenges faster and choose the most cost-effective solutions to meet fast-evolving customer needs.

Ecosystem
Partners and Interoperability

Solutions & VNFs

casa systems   ENEA Qosmos Division   RAD

wipro   Telco Systems A BATM Company   6WIND   VERSA NETWORKS

OS & Virtualization

CANONICAL   vmware

WIND AN INTEL COMPANY   openstack   MIRANTIS   redhat
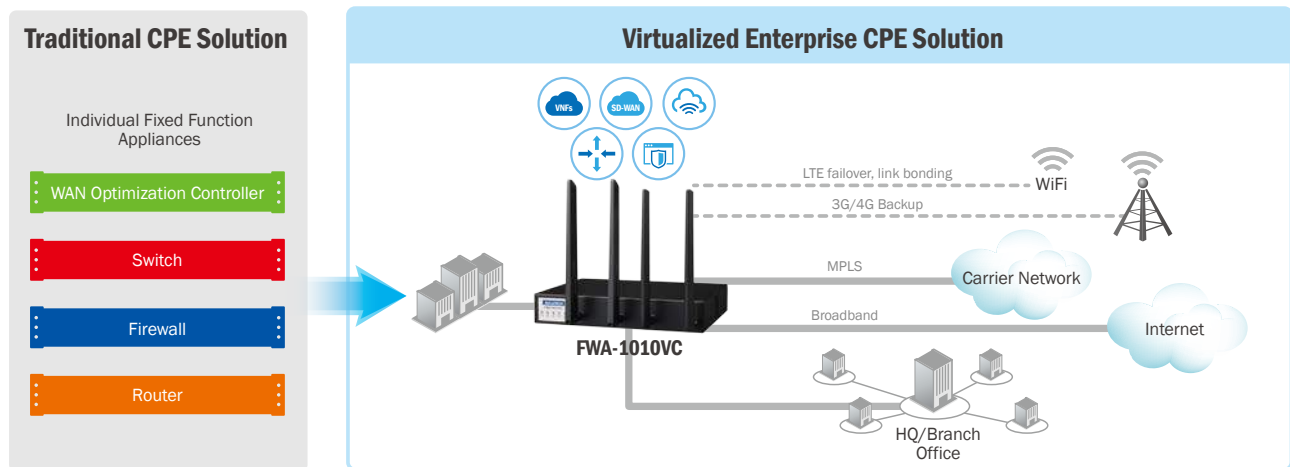
Hardware

intel   BROADCOM

The Advantech FWA-1010VC is a whitebox universal CPE (uCPE), available with a single 4 or 8-core Intel® Atom™ Processor C2000 offering a choice of performance levels to match the required workload. 2-core versions are available on request for the most cost sensitive applications with moderate performance requirements. Support for the data plane development kit (DPDK) on all network interfaces provides an increase of up to 10x in packet throughput. Support for Intel® QuickAssist Technology (QAT) offers crypto and compression acceleration which offloads compute-intensive security and compression operations, freeing up CPU cores.

Universal CPE

Customer premise equipment (CPE) traditionally consists of provider-installed and owned, specialized hardware devices that perform dedicated network functions. Having to comply with this deployment model can be a challenge for businesses when opening new branch offices or adopting new network functions in their existing IT infrastructure. In a virtual Enterprise CPE (vE-CPE) model, as defined by ETSI, all the network functions can be consolidated using software-based virtual network functions (VNFs) running on top of a single uCPE.

Although standard IT servers may be considered for the deployment of uCPE, white box appliances such as the Advantech FWA-1010VC are capable of enabling service providers with faster on-demand services delivery. Advantech's FWA-1010VC whitebox uCPE devices have been cost optimized for exact performance and feature sets and are ready for the next wave of uCPE and SD-WAN deployments in volume.

Traditional CPE Solution

Individual Fixed Function Appliances

WAN Optimization Controller

Switch

Firewall

Router

Virtualized Enterprise CPE Solution

VNFs SD-WAN

LTE failover, link bonding

WiFi

3G/4G Backup

MPLS

Carrier Network

Broadband

Internet

FWA-1010VC

HQ/Branch Office

Desktop All-in-one Security Gateway

Unified Threat Management (UTM) solutions are particularly well suited to SMBs as they provide an integrated, scalable and relatively inexpensive solution requiring less expertise to manage than fixed function devices with separate management interfaces. Available as tabletop devices that are easy to purchase, deploy and manage, entry level UTMs need to provide sufficient performance, network connectivity and throughput to consolidate a broad range of functions such as packet filtering, intrusion prevention, application control, content and URL filtering, antivirus, spam blocker, data loss prevention and advanced persistent threat blocking.

The Advantech FWA-1300 range meets the needs for UTM performance at the entry level and is capable of 200 Mbps to over 1 Gbps of firewall throughput and up to 500 Mbps VPN throughput for 500 hundred users depending on the model. The FWA-1330 adopts the Intel® Celeron® Processor while the FWA-1320 is based on the Intel® Atom™ processor C2000 family extending the scalability of the Intel® platform for communications infrastructure all the way down to this desktop appliance.

The FWA-3260 1U network appliance features the Intel Xeon® Processor D System On Chip to meet the need for higher core count, larger and faster memory as well as increased I/O performance without sacrificing cost efficiency in a compact footprint. With up to 16 Intel Xeon® class cores and 1.5MB last level cache per core tightly integrated with DDR4 memory controllers and a rich I/O subsystem, the Xeon® D SoC performs extremely well in applications tailored for multicore designs. Two integrated 10GbE controllers with 128 TX/RX queues per port, support for SR-IOV and optimizations for network overlays such as VxLAN and NVGRE as well as high performance PCIe gen.3 interfaces complement the processor subsystem of the SoC.

Session Border Controller

A Session Border Controller does exactly what is says, controls the data streams and sessions as they traverse the border or interconnection point between two networks. The border point of control can be in the enterprise e.g. where a corporate network enters the public Internet or at an interconnect between two service providers. In either case the SBC provides a variety of functions for its host network. Flexibility, connectivity and performance are all required to size the ideal Session Border Control platform to the number of sessions which can be supported, reaching tens of thousands of signaling sessions and several hundred thousand users at the high end.
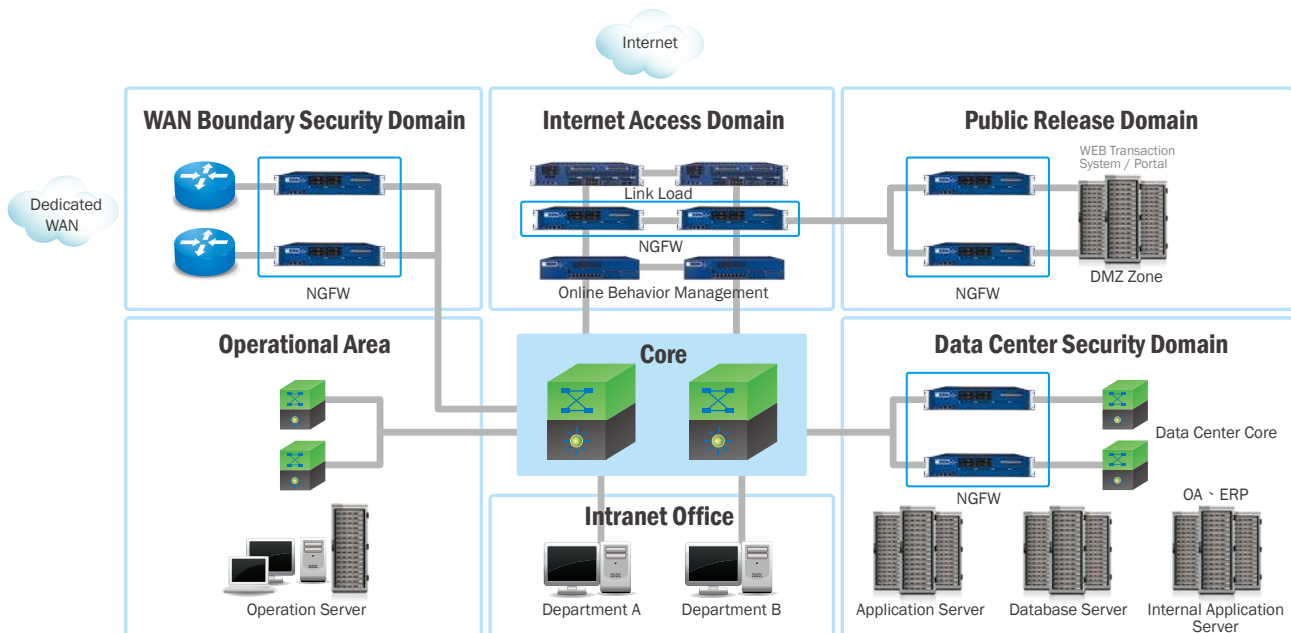
Advantech's network appliance product line provides these three key vectors. In addition, long term commitment and expertise in designing and supplying open standard x86 platforms ensures that Advantech offerings always provide for the latest technology and can demonstrate clear upgrade paths. The Advantech FWA-3230 is an excellent example of an OEM application ready platform based on Intel architecture with a choice of Intel® Xeon® Processor E3 series or Intel® Core™ i7/i5/i3 Processors and a wide choice of I/O expansion options. The FWA-3230 is ideally geared towards the mid-range needs of the SBC OEM.

Next Generation Firewall

As security threats intensify, appliance markets continue to experience high growth in many areas especially network security, where demand for on premise hardware solutions in the Unified Threat Management (UTM) segment continues to grow. Next Generation Firewall (NGFWs) maintain the same functions as a traditional firewall and introduce improved traffic filtering using deeper levels of packet content inspection up to the application layer in the OSI stack.

Ideally suited to fit anywhere into a NG-FW or UTM portfolio, the FWA product line is deployed in volume in Enterprise datacenter, Provider Edge and Customer Edge equipment ranging from 2 to over 300 processor cores offering a broad choice of port counts and speeds from 1 to 100Gbe. The FWA series of appliances leverages DPDK and Intel QuickAssist Technology across a broad range of commercial-off-the-shelf platforms from entry-level tabletop devices to mid-range SMB and ultra-high-end appliances.

The FWA-4231 is particularly well suited for cost optimized mid-range NG-FW deployment. The FWA-4231 is based on the 4th generation Intel® Xeon® Processor E3 series and Intel® Core™ i7/i5/i3 Processors. It features a modular design with four Network Mezzanine Card expansion slots and supports up to 32 x 1GbE or 16 x 10GbE interfaces.

Internet

WAN Boundary Security Domain

Dedicated WAN

NGFW

Internet Access Domain

Link Load

NGFW

Online Behavior Management

Public Release Domain

WEB Transaction System / Portal

NGFW

DMZ Zone

Operational Area

Operation Server

Core

Intranet Office

Department A   Department B

Data Center Security Domain

NGFW

Data Center Core

OA、ERP

Application Server   Database Server   Internal Application Server

FWA-5020

The FWA-5020 is a 1U rackmount appliance optimized for networking applications that features either one or two Intel® Xeon® E5-2600 v4 processors. The appliance can be configured with 12- to 22-core CPUs thanks to advanced thermal system design that supports processor wattage of up to 145W. The system architecture of the FWA-5020 puts an emphasis on compute performance, data plane throughput and encryption throughput. Some of the optimizations include larger on-chip cache memories and Intel QuickPath Interconnects, running at up to 9.6GT/s for reduced cross-socket memory I/O latencies and increased throughput.

▌ Mobile Security Gateway

Mobile Network Operators are seriously challenged by new security risks that can adversely affect their network infrastructure, causing potential denials of service or compromising user data. To provide comprehensive protective measures, 3GPP has carefully defined the security mechanisms that must be implemented by security gateways (SeGW) in 3G and 4G networks. Instead of locating gateways in the network core itself and then backhauling the data to the gateway for processing, data is secured as it hits the network by placing gateways at the very edge, accepting only authorized traffic onto the core network and then encrypting it using strong algorithms such as IPsec.

Casa Systems partnered with Intel and Intel Network Builders members Advantech and Wind River to develop a complete, deployable gateway solution, at the core of which is the FWA-5020 high performance network appliance from Advantech.

The SeGW based on The FWA-5020 is deployed at the network edge and has a capacity of up to 40 Gbps of full duplex throughput even with high volumes of small packets. The gateway supports up to 1 million concurrent IPsec tunnels or 2 million IPSEC Security Associations and 5,000 tunnels per second. From a performance perspective it is capable of 100 Gbps IPSec throughput for 128 byte packets and 110 Gbps for 256 byte packets.
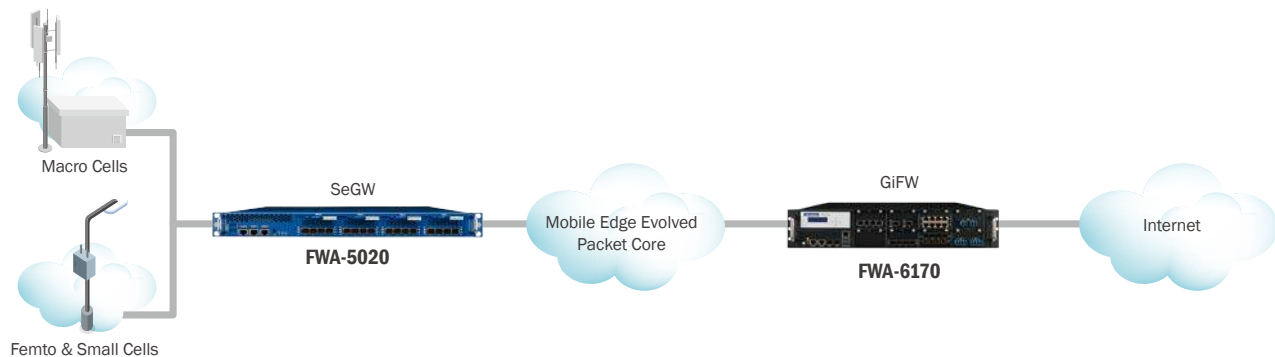
▌ Gi-LAN

Deploying network functions on the Gi-LAN, a part of the network that sits between the mobile core and the internet, has always been the territory of some of the most demanding packet processing workloads. Millions of mobile subscribers access network services through the Gi-LAN at any given time as communications service providers (CSPs) classify traffic directing it only when necessary to specific network services in order to meet policy enforcement and specific service level agreement needs.

Advantech's FWA-6170 is a high-end network appliance ideally suited for service function chaining in software defined networks in both data centers and telecommunications networks. The FWA-6170, is a powerful and flexible 2U platform that delivers up to wire speed IP packet classification using two Intel® Xeon® Platinum Processors. Its new security features and augmented platform modularity, enables equipment and service providers to build faster, more secure networks, bringing greater cost-efficiency to applications in the Gi-LAN while leaving sufficient overhead to anticipate future infrastructure changes.
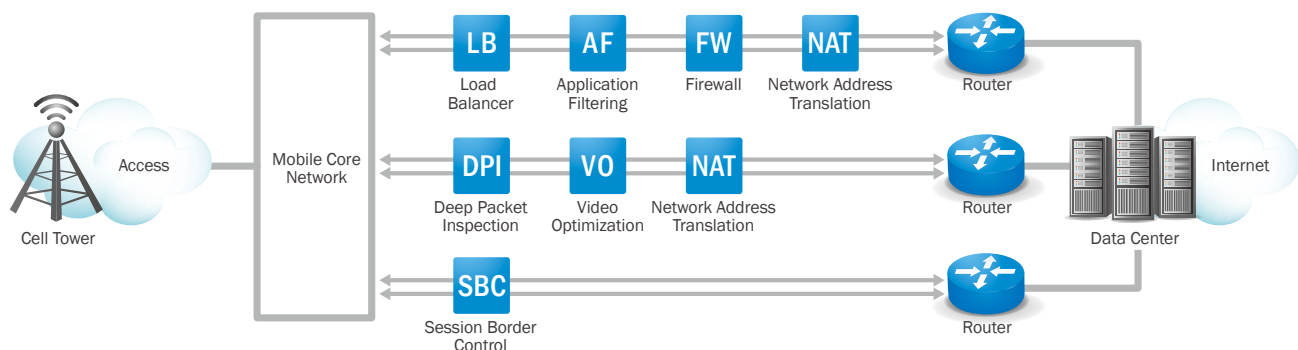
For developers consolidating workloads on x86-based architectures, Advantech's FWA-6520 has been designed for maximum performance, scalability, functionality in a 2U rack mount form factor. Two Intel® Xeon® Processor E5-2600 v4 CPU large on-chip cache memories and two Intel® QuickPath Interconnects running at up to 9.6GT/s for reduced cross-socket memory latencies and increased throughput. Each socket supports 4 DDR4 channels at up to 2133 MHz for a maximum of 512GB of ECC memory using RDIMM technology.
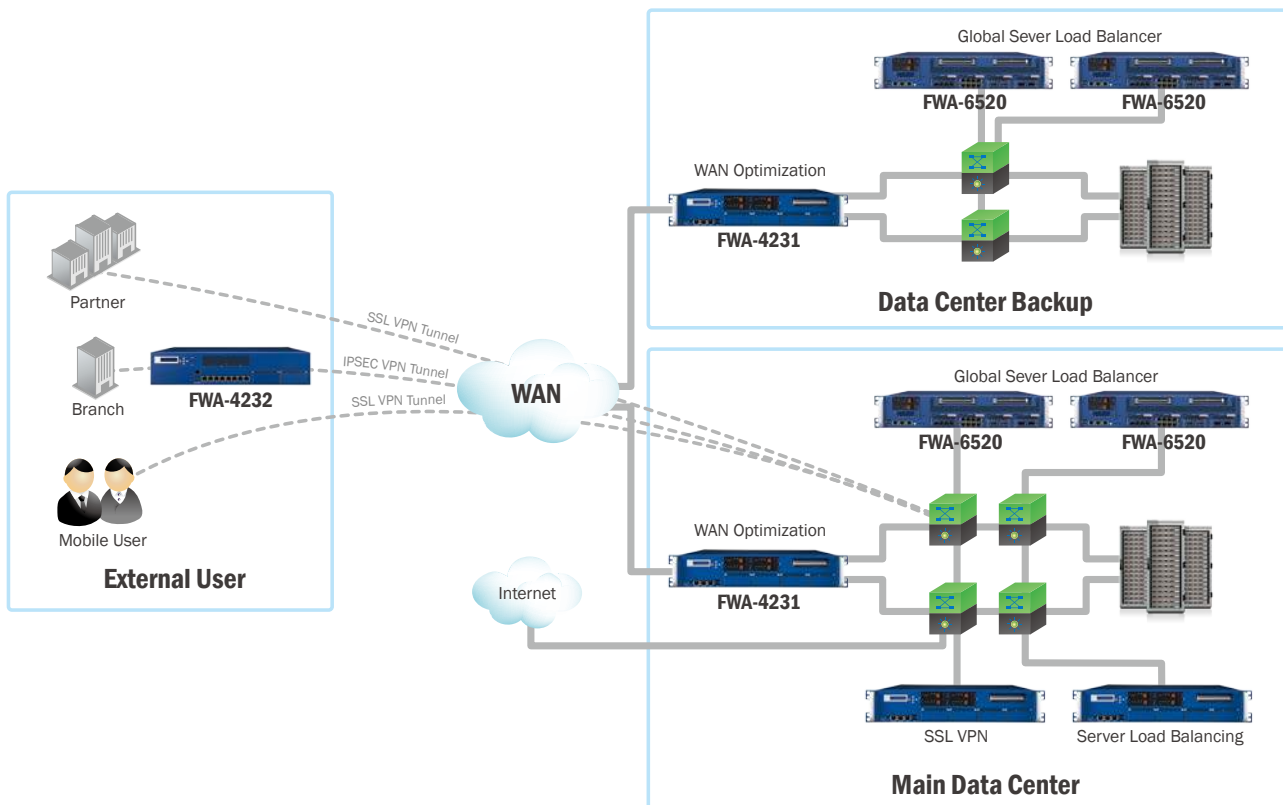
Deep Packet Inspection

Deep packet inspection or DPI is now a fast growing application area, both in terms of technology and market size. Tradition- ally, DPI was the realm of hardware-based accelerated packet processing and made broad use of custom or proprietary network adapters based on FPGAs or proprietary silicon in the form of Network Processors sourced from several foundries. Now, with high-end processing capacities in Intel® architecture processors, coupled with the open source Data Plane Developers Kit (DPDK) and Hyperscan technology libraries that deliver high-performance multiple regex matching, DPI functionality is being embedded directly into the network on a larger scale.

Performance is undoubtedly one crucial element of any DPI solution but so is cost. Advantech's FWA-6520 High-Performance Intel® Xeon® based Network Appliance addresses both aspects and can deliver wire-speed packet processing, at a significantly better price/performance ratio than a proprietary solution.

Load Balancing

The function of a Load Balancer, also known as an application-delivery controller (ADCs) is to distribute workloads to back-end servers in order to ensure optimum use of overall server capacity and improve application performance. Whether applications remain in enterprise data centers or are shifted into the cloud, server load balancing remains a key element and continues to be broadly deployed for workload distribution across server farms.

Load balancer performance requirements continue to grow as the range of functionality increases. Advantech's FWA-6520 series is an ideal platform to meet high performance load balancing needs. It is designed for maximum performance, scalability and functionality in a 2U rack mount footprint. This dual processor-based, high-end network appliance is optimized to balance com- pute performance with high speed, high density I/O and best-in-class energy efficiency.

Global Sever Load Balancer

FWA-6520   FWA-6520

WAN Optimization

FWA-4231

Data Center Backup

Partner

Branch   **FWA-4232**

Mobile User

External User

SSL VPN Tunnel

IPSEC VPN Tunnel

SSL VPN Tunnel

WAN

Internet

Global Sever Load Balancer

FWA-6520   FWA-6520

WAN Optimization

FWA-4231

SSL VPN   Server Load Balancing

Main Data Center

FWA Network Appliances Introduction

FWA 1000 Series
Entry Level Tabletop Network Appliance

- Platform – Intel® Atom™ or Celeron™ SoC
- Green – Ultra low power consumption, minimum 4.3 Watts
- Multi cores – 2C, 4C & 8C, support QAT or Virtualization
- Networking – Up to 7 GbE
- Expansion – MiniPCIe, m.2 for wireless communication
- Mounting – Wall, Rack Mount kits

FWA 2000 Series
Entry-Level 1U Rackmount Network Appliances

- Platform – Intel® Atom™ or Celeron™ SoC
- Green – Ultra low power consumption, minimum 6.5 Watts
- Multi cores – up to 16C, support QAT or Virtualization
- Networking – Minimum 7 GbE and 10GbE, can be expanded via NMC module
- Expansion and LCM – 1 NMC, PCIe x 4, LCD Module option
- Storage – 3.5", 2.5" HDD/ SSD, m.2 SSD, mSATA or PCIe NVMe SSD

FWA 3000 Series
Mid-Range 1U Rackmount Network Appliances

- Platform – Intel® Core™ i7/i5/i3, Xeon® E3 to Xeon-D SoC Processor
- Performance – Up to 3.6GHz, Featuring multi-core embedded processor with high memory bandwidth
- Networking – Up to 8 GbE and 10GbE, can be expanded via NMC module Advanced LAN Bypass
- Expansion – PCIe x4/ x8/ x16, up to 4 Advantech NMC Cards w/ PCIe gen.3 based networking and I/O expansion
- Storage – 3.5", 2.5" HDD/ SSD, m.2 SSD, mSATA, CF/CFast or PCIe NVMe SSD
- Power – Single AC or Redundant AC/DC

FWA 4000 Series
Mid-Range 2U Rackmount Network Appliances

- Platform – Intel® Core™ i7/i5/i3 to Xeon® E3 Processor
- Performance – Up to 3.6GHz, Featuring multi-core embedded processor with high memory bandwidth
- Networking – Up to 8 GbE , can be expanded via NMC module Advanced LAN Bypass
- Expansion – PCIe x4/ x8/ x16, up to 4 Advantech NMC Cards w/ PCIe gen.3 based networking and I/O expansion
- Storage – up to 4 x 3.5", 2 x 2.5" HDD/ SSD, mSATA, CF/CFast or PCIe NVMe SSD
- Power – Redundant AC/DC

FWA 5000 Series
High-End 1U Rackmount Network Appliances

• Platform – Single or Dual Intel® Xeon® E5 processor(s)

• Performance – Up to 22C, maximum memory bandwidth

• Networking – Up to 6 GbE, up to 2 x 10GbE, can be expanded via NMC module, Advanced LAN Bypass

• Expansion – PCIe x4/ x8/ x16, up to 4 Advantech NMC Cards w/ PCIe gen.3 based networking and I/O expansion

• Storage – up 2 x 2.5" HDD/ SSD, mSATA or PCIe NVMe

• IPMI 2.0 – compliant Remote Management

• Power – Redundant AC/DC

FWA 6000 Series
High-End 2U Rackmount Network Appliances

• Platform – Single or Dual Intel® Xeon® E5 processor(s)

• Performance – Up to 28C, Maximum memory bandwidth, support QAT or Virtualization

• Networking – 2 GbE, up to 2 x 10GbE, , can be expanded via NMC module Advanced LAN Bypass

• Expansion – PCIe x4/ x8/ x16, up to 8 Advantech NMC Cards w/ PCIe gen.3 based networking and I/O expansion

• Storage – up to 4 x 3.5", 10 x 2.5" HDD/ SSD, mSATA, CF or PCIe NVMe SSD

• IPMI 2.0 – compliant Remote Management

• Power – Redundant AC/DC

• Modular Design- Easy serviceability

NMC Series
Network Mezzanine I/O Cards

• Networking – 1GbE, 10GbE, 40GbE~100GbE options

• Networking Interface: RJ45/ SFP/ SFP+/ QSFP+

• I/O – PoE, storage options

• Compatibility – Compatible with Advantech FWA series

• Feature – Hot Protection, Present Detection, Bypass function, Subsystem ID and Customized FRU.

Model		FWA-1010VC	FWA-1320	FWA-1330	FWA-2011
Form Factor		Tabletop	Tabletop	Tabletop	1U - Rack Mount
Processor System	Processor	Intel® Atom™ C2558/C2758	Intel Atom C2358/2558	Intel® Celeron N2807/J1900	Intel ATOM E3930/E3940
	Core Number	4/8-core	2/4-core	2/4-core	2/4-core
	Cache	2MB/4MB	1MB/2MB	1MB/2MB	2MB/2MB
	Chipset	N/A	N/A	N/A	N/A
	BIOS	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit
Virtualization		VT-x	VT-x	VT-x	VT-x, VT-d
Memory	Technology	DDR3/DDR3L 1600MHz	DDR3/DDR3L 1600MHz	DDR3L 1600MHz	DDR3L 1866MHz
	Max. Capacity	32GB	16GB	8GB	16GB
	Socket	2x 240-pin DIMM	2x 240-pin DIMM	1x 204-pin SO-DIMM	2x 204-pin SO-DIMM
	ECC Support	Yes	Yes	N/A	Yes
Networking	Controller	3x Marvell 88E1112 1x Marvell 88E6141 switch	4x Marvell 88E1111 2x Intel i210-AT	4x Intel i211-AT	6x Intel i210-AT
	1GbE	2x GbE RJ45 or SFP auto-negotiation via Marvell 88E1112 1x GbE RJ45 via Marvell 88E1112 4x GbE RJ45 via Marvell 88E6141 switch	4x GbE RJ45 w/ LAN bypass via Marvell 88E1111 2x GbE RJ45 via Intel i210-AT	4x GbE RJ45 w/ LAN bypass via Intel i211-AT	6x GbE RJ45 w/ LAN bypass via Intel i210-AT
	10GE	N/A	N/A	N/A	N/A
	LAN bypass — Advanced	N/A	2x segment (4x ports)	N/A	N/A
	LAN bypass — Legacy	N/A	N/A	2x segment (4x ports)	2x segment (4x ports)
Expansion	PCIe x 16/ 8/ 4/ 1	N/A	N/A	N/A	N/A
	NMC	N/A	N/A	N/A	1x NMC
	m.2 PCIe	1x M.2 2232 for WiFi module with 2x antenna holes	N/A	N/A	N/A
	Mini PCIe	1x full-size Mini PCIe with SIM holder for 3G/4G LTE module with 2x antenna holes	N/A	1x mini PCIe, half size, USB interface (Option with PCIe interface)	N/A
Storage	HDD/SSD	1x 2.5" SATA SSD bracket (Max 9.5mm height only) (only on C2758 SKU)	1x 2.5" SATA HDD/SSD bracket (Max 9.5mm height only)	1x 2.5" SATA HDD/SSD bracket	1x 3.5" SATA HDD/SSD bracket
	m.2 SSD	1x M.2 2280 slot (option for 2x M.2 2242)	N/A	N/A	NA
	mSATA/ CF/ Cfast	N/A	1x mSATA slot	1x mSATA slot	1x mSATA slot
Display		N/A	N/A	1x VGA port	VGA box header
I/O	Console port	1	1	1	1
	USB3.0	N/A	N/A	N/A	2
	USB2.0	1x USB2.0	2x USB2.0	2x USB2.0	N/A
	GPIO	Pin Header	Pin Header	Pin Header	Pin Header
	LED Indicator	Power, HDD, LTE, WiFi, SW defined status	Power, HDD status	Power, HDD status, LAN status	1x Power, HDD
	Reset button	N/A	N/A	N/A	NA
	Others	1x power switch 1x software definable button	1x power switch	1x power switch	1x power switch
TPM		Option with TPM module (TPM1.2 module 98923260H0E)	TPM1.2	N/A	N/A
LCD Module		N/A	N/A	N/A	16x2 graphic display,5 buttons
Power	Power Type	DC	DC	DC	AC
	Watts	60W	84W	40W	60W
	Input	100V ~ 240V	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V
	Connector	DC Jack	DC Jack	DC Jack	AC 3pin plug
	Power Adaptor	12V 5A, 60W external adaptor	12V 7A, 84W external adaptor	External AC/DC,adapter	AC, Openframe
Environment	Operating Temperature (air flow 0.7 m/sec)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
	Non-operating Temperature	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)
	Vibration Resistance	With SSD: 0.3 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis With SSD: 0.3 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis With SSD: 0.3 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis With SSD: 0.3 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis
	Shock Protection	With SSD: 10G, IEC-60068-2-27, half sine, 11ms duration	With HDD: 10G, IEC-60068-2-27, half sine, 11ms duration With SSD: 10G, IEC-60068-2-27, half sine, 11ms duration	With HDD: 10G, IEC-60068-2-27, half sine, 11ms duration With SSD: 10G, IEC-60068-2-27, half sine, 11ms duration	With HDD: 10G, IEC-60068-2-27, half sine, 11ms duration With SSD: 10G, IEC-60068-2-27, half sine, 11ms duration
Cooling		1x system fan with smart fan	1x system fan with smart fan	1x system fan with smart fan	2x system fan with smart fan
Mechanical	Mounting	Option with rackmount & wallmount kit	N/A	N/A	1U Rackmount
	Dimensions (W x H x D)	250 x 44 x 190.4mm (9.8" x 1.7" x 7.5")	280 x 44 x 176mm (11" x 1.7" x 6.9")	208 x 44 x 178mm (8.2" x 1.7" x 7.0")	430 x 44 x 300 mm (16.7" x 1.7" x 11.8")
OS Support		Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages		- QuickStart Linux Image (Ubuntu based reference BSP) including -- afru -- lmsensors -- flashrom -- Sierra QMI drivers -- Intel DPDK -- Intel QAT -- DUI (Offline Diagnostics) Individual packages: - DUI (Offline Diagnostics)	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- lmsensors -- flashrom -- Advanced LBP Utility -- DUI (Offline Diagnostics) Individual packages: - Advanced LBP Library - DUI (Offline Diagnostics)	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- lmsensors -- flashrom -- Legacy LBP utility Individual packages: - Legacy LBP utility	Individual packages: - Advanced LBP Library
IPMI		N/A	N/A	N/A	N/A
Certification		CE, FCC Class B (with RF), CCC, CB, UL, BSMI, KCC, VCCI, RCM, BIS	CE, FCC, CB, UL, CCC	CE, FCC, CB, UL, CCC	CE, FCC, CB, UL, CCC

Model	FWA-2012	FWA-2320	FWA-2330	FWA-3231
Form Factor	1U - Rack Mount	1U - Rack Mount	1U - Rack Mount	1U - Rack Mount
Processor System — Processor	Intel® Atom™ C3338/C3538/ C3558/C3758/C3858/C3958	Intel Atom C2358/2558/C2758	Intel Celeron J1900	4th Gen Intel Xeon E3, Core-I family, Pentium & Celeron processors
Core Number	2/4/6/8/12/16-core	2/4/8-core	4-core	2/4-core
Cache	≤8C L2 is 2MB/Core >8C is 2MB/Core Pair	1MB/2MB/4MB	2MB	2MB/3MB/4MB/6MB/8MB
Chipset	N/A	N/A	N/A	Intel C226
BIOS	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit
Virtualization	VT-x, VT-d	VT-x	VT-x	VT-x, VT-d
Memory — Technology	DDR4 2133/2400MHz	DDR3/DDR3L 1600MHz	DDR3L 1600MHz	DDR3 1600MHz
Max. Capacity	64GB	16GB	8GB	32GB
Socket	2x 288-pin DIMM	2x 240-pin DIMM	1x 204-pin SO-DIMM	4x 240-pin DIMM
ECC Support	Yes	Yes	N/A	Yes
Networking — Controller	4x Marvell 88E1543 2x Intel i210-AT	4 x Marvell 88E1111 2 x Intel i210	4x Intel i211-AT	2x Intel i210-AT
1GbE	4x GbE RJ45 w/ LAN bypass via Marvell 1543 2x GbE RJ45 via Intel i210-AT	4x GbE RJ45 w/ LAN bypass via Marvell 88E1111 2x GbE RJ45 via Intel i210-AT	4x GbE RJ45 w/ LAN bypass via Intel i211-AT	2x GbE RJ45 via Intel i210-AT
10GE	N/A	N/A	N/A	N/A
LAN bypass — Advanced	2x segment (4x ports)	2x segment (4x ports)	N/A	N/A
LAN bypass — Legacy	N/A	N/A	2x segment (4x ports)	Supported by NMC
Expansion — PCIe x 16/ 8/ 4/ 1	N/A	N/A	N/A	N/A
NMC	1x NMC	N/A	1x NMC	4x NMC
m.2 PCIe	N/A	`	N/A	N/A
Mini PCIe	N/A	N/A	N/A	N/A
Storage — HDD/SSD	1x 3.5"/2.5" SATA HDD/SSD bracket	1x 2.5" SATA HDD/SSD bracket (Max 9.5mm height only)	1x3.5" SATA HDD bracket	2x 2.5" SATA HDD/SSD bracket
m.2 SSD	1x M.2 2280 slot	N/A	N/A	N/A
mSATA/ CF/ Cfast	N/A	1x mSATA slot	1x mSATA slot	1x mSATA slot
Display	N/A	N/A	VGA box header	VGA box header
I/O — Console port	1		1	1
USB3.0	2x USB3.0	N/A	N/A	N/A
USB2.0	N/A	2x USB2.0	2	2x USB2.0
GPIO	Pin Header	Pin Header	Pin Header	Pin Header
LED Indicator	Power, Status, Location LED	Power, HDD status	Power, HDD status LED	Power, Status, Location LED
Reset button	Yes		Pin Header	Pin Header
Others	1x power switch	1x power switch	1x power switch	1x power switch
TPM	Option with TPM1.2 or 2.0 module	TPM1.2	N/A	N/A
LCD Module	N/A Optional for LCD Module	16x2 graphic display, 5 buttons	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons
Power — Power Type	AC	AC	AC	AC, fixed & redundant option DC, redundant option
Watts	150W	100W	16x2 graphic display,5 buttons	250W / 300W (1+1)AC/DC
Input	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V / DC-48V
Connector	AC 3pin plug	AC 3pin plug	AC 3pin plug	AC 3pin plug
Power Adaptor	N/A	N/A	N/A	N/A
Environment — Operating Temperature (air flow 0.7 m/sec)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
Non-operating Temperature	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)
Vibration Resistance	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis With SSD: 0.3 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis With SSD: 0.3 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis
Shock Protection	With SATA HDD: 10G, IEC-60068-2-27, half sine,11ms duration	With HDD: 10G, IEC-60068-2-27, half sine, 11ms duration With SSD: 10G, IEC-60068-2-27, half sine, 11ms duration	With HDD: 10G, IEC-60068-2-27, half sine, 11ms duration With SSD: 10G, IEC-60068-2-27, half sine, 11ms duration	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis
Cooling	2 system fan with smart fan	1x system fan with smart fan	2x system fan with smart fan	4x system fan with smart fan
Mechanical — Mounting	1U Rackmount	1U Rackmount	1U Rackmount	1U Rackmount
Dimensions (W x H x D)	430 x 44 x 320.7mm (16.7" x 1.7" x 12.6")	426 x 44 x 318mm (16.8" x 1.7" x 12.5")	430 x 44 x 300mm (16.7" x 1.7" x 11.8")	430 x 44 x 550mm (16.9" x 1.7" x 21.6")
OS Support	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- ipmitool -- lmsensors -- LCD4Linux -- Intel DPDK -- Advanced LBP utility Individual packages: - Advanced LBP utility	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- lmsensors -- flashrom -- LCD4Linux -- Advanced LBP Utility -- DUI (Offline Diagnostics) Individual packages: - Advanced LBP Library	Individual packages: - Legacy LBP utility	Individual packages: - Legacy LBP utility
IPMI	Option with Advantech LOM Module	N/A	N/A	N/A
Certification	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL

Model	FWA-3232	FWA-3260	FWA-3270	FWA-4231
Form Factor	1U - Rack Mount	1U - Rack Mount	1U - Rack Mount	2U - Rack Mount
Processor System Processor	4th Gen Intel Xeon E3, Core Desktop family, Pentium & Celeron processors	Intel Xeon processor D-1500 processor family	6th Gen Intel Xeon E3, Core Desktop family, Pentium & Celeron processors	4th Gen Intel Xeon E3, Core-I family, Pentium & Celeron processors
Core Number	2/4-core	Default: 4/8-core Option: 2/6/12/16-core	2/4-core	2/4-core
Cache	2MB/3MB/4MB/6MB/8MB	3MB/6MB/9MB/12MB/18MB/24MB	2MB/3MB/4MB/6MB/8MB	2MB/3MB/4MB/6MB/8MB
Chipset	Intel C226/H81	N/A	Intel C236 & H110	Intel C226
BIOS	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit
Virtualization	VT-x, VT-d	VT-x, VT-d	VT-x, VT-d	VT-x, VT-d
Memory Technology	DDR3 1600MHz	DDR4 2400MHz	DDR4 2400MHz	DDR3 1600MHz
Max. Capacity	32GB	128GB	64GB	32GB
Socket	4x 240-pin DIMM	4x 288-pin DIMM	4x 288-pin DIMM	4x 240-pin DIMM
ECC Support	Yes (3233A)	Yes	Yes	Yes
Networking Controller	8x Intel i210-AT(3232A) 6x Intel i210-AT(3232B)	1x Intel i350-AM4 2x Intel i210-AT	8x Intel i210-AT(3270A) 6x Intel i210-AT(3270B)	2x Intel i210-AT
1GbE	8x GbE RJ45 w/ LAN bypass via Intel i210-AT (3233A) 6x GbE RJ45 w/ LAN bypass via Intel i210-AT (3233B)	4x GbE RJ45 w/ LAN bypass via Intel i350-AM4 2x GbE RJ45 via Intel i210-AT	8x GbE RJ45 w/ LAN bypass via Intel i210-AT 6x GbE RJ45 w/ LAN bypass via Intel i210-AT	2x GbE RJ45 via Intel i210-AT
10GE	N/A	2x 10G SFP+ via Intel Xeon-D SoC	N/A	N/A
LAN bypass — Advanced	N/A	2x segment (4x ports)	N/A	Supported by NMC
LAN bypass — Legacy	3 segment (6x ports)	N/A	3 segment (6x ports) (3270A) 2 segment (4x ports) (3270B)	N/A
Expansion PCIe x 16/ 8/ 4/ 1	1x PCIe x8 FH/HL slot	1x PCIe x8 FH/HL slot	1x PCIe x8 FH/HL slot (3270A)	1x PCIe x16 FH/HL slot
NMC	2x NMC (3232A) 1x NMC (3232B)	2x NMC	2x NMC (3270A) 1x NMC (3270B)	4x NMC
m.2 PCIe	N/A	N/A	N/A	N/A
Mini PCIe	N/A	N/A	N/A	N/A
Storage HDD/SSD	2x 2.5" SATA HDD/SSD bracket	2x 2.5" SATA HDD/SSD bracket	2x 2.5" SATA HDD/SSD bracket	4x 2.5" SATA HDD/SSD tray or 2x 3.5" HDD tray
m.2 SSD	N/A	2x M.2 2280 slot	1x M.2 2280 slot	N/A
mSATA/ CF/ Cfast	1x mSATA slot	N/A	1x mSATA slot	1x mSATA slot
Display	VGA box header	N/A	HDMI(3270A)/ DVI(3270B)	VGA box header
I/O Console port	1	1	1	1
USB3.0	2 x USB3.0	2	2	N/A
USB2.0	N/A	N/A	N/A	2
GPIO	Pin Header	Pin Header	Pin Header	Pin Header
LED Indicator	Power, HDD status LED	Power, HDD status LED	Power, HDD status LED	1x Power led, 1x HDD led,1xLocation
Reset button	Pin Header	Pin Header	Pin Header	Pin Header
Others	1x power switch	1x power switch	1x power switch	1x power switch
TPM	TPM1.2	TPM2.0: 3260A TPM1.2: 3260B	Option with TPM1.2 or 2.0 module	TPM 1.2
LCD Module	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons
Power Power Type	AC, fixed & redundant option DC, redundant option	AC, fixed & redundant option DC, redundant option	AC, fixed & redundant option DC, redundant option	AC, fixed & redundant option DC, redundant option
Watts	250W / 300W (1+1)AC/DC	250W / 300W (1+1)AC/DC	250W / 300W (1+1)AC/DC	350W/ 300W
Input	100 V ~ 240 V / DC-48V	100 V ~ 240 V / DC-48V	100 V ~ 240 V	100 V ~ 240 V/-36~-60vdc
Connector	AC 3pin plug	AC 3pin plug	AC 3pin plug	AC 3pin plug
Power Adaptor	N/A	N/A	N/A	N/A
Environment Operating Temperature (air flow 0.7 m/sec)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
Non-operating Temperature	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)
Vibration Resistance	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis
Shock Protection	With SATA HDD: 10G, 11ms, IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms, IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis
Cooling	4x system fan with smart fan	4x system fan with smart fan	4x system fan with smart fan	3x system samrt fan
Mechanical Mounting	1U Rackmount	1U Rackmount	1U Rackmount	2U Rackmount
Dimensions (W x H x D)	FWA-3232A 430 x 44 x 500mm(16.9" x 1.7" x 19.6") FWA-3232B 430 x 44 x 375mm(16.9" x 1.7" x 14.7")	430 x 44 x 500mm (16.6" x 1.7" x 19.7")	FWA-3270A 430 x 44 x 500mm(16.9" x 1.7" x 19.6") FWA-3270B 430 x 44 x 375mm(16.9" x 1.7" x 14.7")	430 x 88 x 550mm (16.9" x 3.4" x 21.6")
OS Support	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages	Individual packages:- Legacy LBP utility	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- ipmitool -- lmsensors -- flashrom -- LCD4Linux -- Advanced LBP Utility Individual packages: - Advanced LBP Library	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- lmsensors -- flashrom -- LCD4Linux -- Advanced LBP Utility Individual packages: - Advanced LBP Library	Individual packages: - Legacy LBP utility
IPMI	N/A	Option with Advantech LOM Module	Option with Advantech LOM Module	N/A
Certification	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CCC

Model	FWA-4232	FWA-5020	FWA-6170	FWA-6520	FWA-6520L
Form Factor	2U - Rack Mount	1U - Rack Mount	2U - Rack Mount	2U - Rack Mount	2U - Rack Mount
Processor System — Processor	4th Gen Intel Xeon E3, Core-I family, Pentium & Celeron processors	1/2x Intel® Xeon® E5-2600 v3/v4 processor family	2 x Intel® Xeon® Scalable Processor family	2x Intel® Xeon® E5-2600 v3/v4 processor family	1x Intel® Xeon® E5-2600 v3/v4 processor family
Core Number	2/4-core	8C/10C/12C/14C/ 16C/18C/ 20C/22C	8C/10C/12C/14C/16C/18C/ 20C/22C/24C/26C/28C	8C/10C/12C/14C/ 16C/18C/20C/22C	8C/10C/12C/14C/ 16C/18C/20C/22C
Cache	2MB/3MB/4MB/6MB/8MB	30MB ~ 55 MB	30MB ~ 75 MB	30MB ~ 55 MB	30MB ~ 55 MB
Chipset	Intel C226 & H81	Intel C612	Intel C626 or C622	Intel C612	Intel C612
BIOS	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit	AMI Efi 64Mbit
Virtualization	VT-x, VT-d	VT-x, VT-d	VT-x, VT-d	VT-x, VT-d	VT-x, VT-d
Memory — Technology	DDR3 1600MHz	DDR4 2400MHz	DDR4 2666MHz	DDR4 2400MHz	DDR4 2400MHz
Max. Capacity	32GB	512GB	1536GB	512GB	256GB
Socket	4x 240-pin DIMM	8/16x 288-pin DIMM	24x 288-pin DIMM	16x 288-pin DIMM	8x 288-pin DIMM
ECC Support	Yes	Yes	Yes	Yes	Yes
Networking — Controller	8 x Intel i210-AT(4232A) 6 x Intel i210-AT(4232B)	1x Intel i350-AM4 (5020 SKU2) 2x Intel i210-AT	2x Intel i210-AT	2x Intel i210-AT	2x Intel i210-AT
1GbE	8x GbE RJ45 w/ LAN bypass via Intel i210-AT 6x GbE RJ45 w/ LAN bypass via Intel i210-AT	4x GbE RJ45 w/ LAN bypass via Intel i350-AM4 (5020 SKU2) 2 x GbE RJ45 for management via Intel i210-AT	2 x GbE RJ45 for management via Intel i210-AT	2 x GbE RJ45 for management via Intel i210-AT	2 x GbE RJ45 for management via Intel i210-AT
10GE	N/A	2x 10G SFP+ via Intel X710 (5020 SKU2)	2x 10G SFP+ via Intel C622/ C626	N/A	N/A
LAN bypass — Advanced	optional	2x segment (4x ports) (5020 SKU2)	Supported by NMC	Supported by NMC	N/A
LAN bypass — Legacy	3 segment (6x ports) (4232A) 2 segment (4x ports) (4232B)	N/A	N/A	N/A	Supported by NMC
Expansion — PCIe x 16/ 8/ 4/ 1	1x PCIe x8 FH/HL slot	1x PCIe x16 internal proprietary slot	2x PCIe x8 internal slot	2x PCIe x16 FH/HL slot (6520 4x NMC)	1x PCIe x8 internal slot
NMC	2x NMC	2/4x NMC	8x NMC	4/6/8x NMC	4x NMC
m.2 PCIe	N/A	N/A	N/A	N/A	N/A
Mini PCIe	N/A	N/A	N/A	N/A	N/A
Storage — HDD/SSD	2x 2.5" SATA HDD/SSD bracket	2x 2.5"" SATA HDD/SSD hot-swap tray (5020 SKU1/2) 2x 2.5"" SATA HDD/SSD bracket (5020 SKU5)	2x 2.5" SATA HDD/SSD hot-swap tray	2x 2.5" SATA HDD/SSD hot-swap tray	4x 3.5" SATA HDD/SSD tray
m.2 SSD	N/A	N/A	2x M.2 2280 slot	N/A	N/A
mSATA/ CF/ Cfast	1x mSATA slot	2x mSATA slot	N/A	2x mSATA slot	1x CF slot
Display	VGA box header	VGA box header	VGA box header	VGA box header	VGA box header
I/O — Console port	1	Pin Header	1	1	1
USB3.0	N/A	2	2	2	N/A
USB2.0	N/A	N/A	N/A	N/A	2
GPIO	Pin Header	Pin Header	Pin Header	Pin Header	Pin Header
LED Indicator	Power, HDD status LED	Power, HDD status LED	Power, Status, Locate LED by IPMI	Power, Status, Locate LED by IPMI	Power, HDD status LED
Reset button	Pin Header	Pin Header	Pin Header	Pin Header	Pin Header
Others	1x power switch	1x power switch	1x power switch	1 x power button	1x power switch
TPM	TPM 1.2	TPM1.2	Option with TPM1.2 or 2.0 module	TPM1.2	TPM1.2
LCD Module	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons	16x2 graphic display,5 buttons	N/A
Power — Power Type	AC, fixed & redundant option DC, redundant option	AC, redundant option DC, redundant option	AC, redundant option DC, redundant option	AC, redundant option DC, redundant option	AC, redundant option DC, redundant option
Watts	300W/ 250W	650W	800W/1200W	820W	500W
Input	100 V ~ 240 V	(AC) 100V ~ 240V (DC) -40 ~ -72V	(AC) 100V ~ 240V (DC) -40 ~ -72V	(AC) 100V ~ 240V (DC) -40 ~ -72V	(AC) 100V ~ 240V (DC) -40 ~ -72V
Connector	AC 3pin plug	AC 3pin plug	AC 3pin plug	AC 3pin plug	AC 3pin plug
Power Adaptor	N/A	N/A	N/A	N/A	N/A
Environment — Operating Temperature (air flow 0.7 m/sec)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)	0 ~ 40 °C (32 ~ 104 °F)
Non-operating Temperature	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)	-40 ~ 60° C (-50 ~ 140° F)
Vibration Resistance	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis	With SATA HDD: 0.5 Grms, IEC 60068-2-64, 5-500Hz, 1hr/axis
Shock Protection	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms,IEC-60068-2-27, X,Y,X-X,-Y-Z axis, 3times per axis	With SATA HDD: 10G, 11ms,IEC-60068-2-27,X,Y,X-X,-Y-Z axis, 3times per axis
Cooling	3x system samrt fan	2/3x system fan with smart fan	6x system fan with smart fan	3x system fan with smart fan	3x system fan with smart fan
Mechanical — Mounting	2U Rackmount	1U Rackmount	2U Rackmount	2U Rackmount	2U Rackmount
Dimensions (W x H x D)	430 x 88 x 500mm (16.9" x 3.4" x 19.6")	438 x 44 x 625mm (17.24" x 1.732" x 24.61")	438 x 88 x 685mm (17.24" x 3.4" x 27")	430 x 88 x 550mm (16.9" x 3.4" x 21.6")	430 x 88 x 550mm (16.9" x 3.4" x 21.6")
OS Support	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)	Linux (CentOS, Red Hat, Ubuntu)
Advantech S/W Packages	Individual packages: - Legacy LBP utility	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- ipmitool -- LCD4Linux -- Advanced LBP Utility -- Intel DPDK -- Intel QAT -- DUI (Offline Diagnostics) Individual packages: - Advanced LBP Library -- DUI (Offline Diagnostics)	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- ipmitool -- LCD4Linux -- Advanced LBP Utility -- Intel DPDK -- Intel QAT -- DUI (Offline Diagnostics) Individual packages: - Advanced LBP Library -- DUI (Offline Diagnostics)	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- ipmitool -- LCD4Linux -- Advanced LBP Utility -- Intel DPDK -- Intel QAT -- DUI (Offline Diagnostics) Individual packages: - Advanced LBP Library -- DUI (Offline Diagnostics)	- QuickStart Linux Image (CentOS based reference BSP) including -- afru -- ipmitool -- LCD4Linux -- Advanced LBP Utility -- Intel DPDK -- Intel QAT -- DUI (Offline Diagnostics) Individual packages: - Advanced LBP Library -- DUI (Offline Diagnostics)
IPMI	N/A	IPMI v2.0 compliant BMC with web interface	IPMI v2.0 compliant, with web interface, iKVM on request	IPMI v2.0 compliant BMC with web interface	IPMI v2.0 compliant BMC with web interface
Certification	CCC	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CE, FCC, CCC, CB, UL	CCC

Model Name	NMC-0107		NMC-0108		NMC-0111		NMC-0112	
NMC Type	Handle	Thumbscrew Latch (available)	Handle	Thumbscrew Latch (available)	Handle	Latch	Handle	Latch
Part Number	NMC-0107E	NMC-0107-04CBSA1	NMC-0108E	NMC-0108-04FSA1	NMC-0111E	NMC-0111-10E	NMC-0112E	NMC-0112-10E
Status	MP		MP		MP		MP	
Life Cycle	2021 Q1		2021 Q1		2021 Q1		2021 Q1	
Chipset	1x Intel i350-AM4		1x Intel i350-AM4		Intel 82583V x4	Intel I211 x4	Intel I210-IS x4	
Speed	1G		1G		1G		1G	
Network Interface (connector type)	4 Copper(RJ45)		4 Fiber(SFP)		4 Copper(RJ45)		4 Fiber(SFP)	
PCIe	1x PCIe x4, Gen2		1x PCIe x4, Gen2		4 x PCIE x1 Gen2		4 x PCIE x1 Gen2	
LAN Bypass (Legacy/Advanced)	Legacy LBP: (Micro_P 8051) -Bypass, Normal, Disconnect		NA		Lagacy LBP 2 x Pairs		NA	
Present Pin Detection	YES		YES		YES		YES	
LAN LED Definition	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking		**Speed LED (Left)** 1G: Amber on (Downgrade speed) 10G: Green on (Maximum speed) **Link / Act LED (Right)** Link up: Green On Active: Green Blinking		**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking		**Speed LED (Left)** 1G: Amber on (Downgrade speed) 10G: Green on (Maximum speed) **Link / Act LED (Right)** Link up: Green On Active: Green Blinking	

Power	Voltage	+12V ± 15%		+12V ± 15%		+12V ± 15%		+12V ± 15%	
	Consumption	10W		10W		6W		6W	

Environment	Operating Temperature (air flow 0.7 m/sec)	-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)	
	Storage Temperature	-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)	
	Storage Humidity	5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)	
	Vibration Resistance	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	
	Shock Protection	half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)	

Mechanical	Dimensions (W x H x D) mm	73mm x37.26 x 171mm		73mm x37.26 x 171mm		73mm x37.26 x 171mm		73mm x37.26 x 171mm	
	Weight	0.3kg	0.4kg	0.3kg	0.4kg	0.3kg		0.3kg	

Model Name	NMC-0114	NMC-0115	NMC-0116	NMC-0120		NMC-0121		NMC-0801
NMC Type	handle	Handle	handle	Thumbscrew Latch (available)		Thumbscrew Latch (available)		Latch
Part Number	NMC-0114E	NMC-0115E	NMC-0116E	NMC-0120-04FBSSA1	NMC-0120-04FBLSA1	NMC-0121-04CSA1	NMC-0121-04CBSA1	NMC-0801-10E
Status	MP	MP	MP	MP		MP		MP
Life Cycle	2021 Q1	2021 Q1	2021 Q1	2021 Q1		2021 Q1		2021 Q1
Chipset	Intel I350-AM4 x1	Intel I350-AM2 x1	Intel I350-AM2 x1	1x Intel i350-AM4		1x Intel i350-AM4		2x Intel 82580
Speed	1G	1G	1G	1G		1G		1G
Network Interface (connector type)	2 Copper(RJ45) + 2 Fiber(SFP)	2 Copper(RJ45)	2 Fiber(SFP)	4 Fiber LC(SX)	4 Fiber LC(LX)	4 Copper(RJ45)		8 Copper(RJ45)
PCIe	1 x PCIE x4 Gen2	1 x PCIE x4 Gen2	1 x PCIE x4 Gen2	1x PCIe x4, Gen2		1x PCIe x4, Gen2		2x PCIe x4, Gen2
LAN Bypass (Legacy/Advanced)	Lagacy LBP 1 x Pair	Lagacy LBP 1 x Pair	NA	Advance Fiber bypass		N/A	Advanced LBP: (Micro_P 8051) -Bypass, Normal, Disconnect	Lagacy LBP 4 x Pair
Present Pin Detection	YES	YES	YES	YES		YES		N/A
LAN LED Definition	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link/ Act/ Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link/ Act/ Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link/ Act/ Bypass LED (Right)** Link: Green on Active: Green Blinking	**Speed LED: N/A** **Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **BYPASS LED (middle LED)** BYPASS: Amber on DISCONNECT: Amber blinking CONNECT: N/A		**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking		**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link/ Act/ Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking
Power — Voltage	+12V ± 15%	+12V ± 15%	+12V ± 15%	+12V ± 15%		+12V ± 15%		+12V ± 15%
Power — Consumption	10W	10W	10W	10W		10W		15W
Environment — Operating Temperature (air flow 0.7 m/sec)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)
Environment — Storage Temperature	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)
Environment — Storage Humidity	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)
Environment — Vibration Resistance	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
Environment — Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)
Mechanical — Dimensions (W x H x D) mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm		73mm x37.26 x 171mm		73mm x37.26 x 171mm
Mechanical — Weight	0.3kg	0.3kg	0.3kg	0.7kg		0.4kg		0.6kg

Model Name	NMC-0803		NMC-0804	NMC-0805	NMC-0806		NMC-1004	
NMC Type	Handle	Thumbscrew	Thumbscrew	Handle	Thumbscrew Latch (available)		Handle	Thumbscrew Latch(available)
Part Number	NMC-0803E	NMC-0803-08CBSA1	NMC-0804-08FSA1	NMC-0805E	NMC-0806-08CSA1	NMC-0806-08CBSA1	NMC-1004E	NMC-1004-02FSA1
Status	MP		MP	MP	MP		MP	
Life Cycle	2021 Q1		2021 Q1	2021 Q1	2021 Q1		2021 Q1	
Chipset	1x Intel i350-AM4		2x Intel i350-AM4	2x Intel i350-AM4	2x Intel i350-AM4		1x 82599ES	
Speed	1G		1G	1G	1G		10G	
Network Interface (connector type)	8 Copper(RJ45)		8 Fiber(SFP)	4 Copper(RJ45) + 4 Fiber(SFP)	8 Copper(RJ45)		2 Fiber(SFP+)	
PCIe	2x PCIe x4, Gen2		2x PCIe x4, Gen2	2x PCIe x4, Gen2	2x PCIe x4, Gen2		1x PCIe x8, Gen2	
LAN Bypass (Legacy/Advanced)	Legacy LBP: (Micro_P 8051) -Bypass, Normal, Disconnect		NA	NA	NA	Advanced LBP: (Micro_P 8051) -Bypass, Normal, Disconnect	NA	
Present Pin Detection	YES		YES	YES	YES		YES	
LAN LED Definition	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking		**Speed LED (Left)** 1G: Amber on (Downgrade speed) 10G: Green on (Maximum speed) **Link / Act LED (Right)** Link up: Green On Active: Green Blinking	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **BYPASS LED: (middle LED)** BYPASS: Amber on DISCONNECT: Amber blinking CONNECT: N/A	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking		**Speed LED (Left)** 1G: Amber on (Downgrade speed) 10G: Green on (Maximum speed) **Link / Act LED (Right)** Link up: Green On Active: Green Blinking	
Power Voltage	+12V ± 15%		+12V ± 15%	+12V ± 15%	+12V ± 15%		+12V ± 15%	
Consumption	15W		15W	15W	15W		15W	
Environment Operating Temperature (air flow 0.7 m/sec)	-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)	
Storage Temperature	-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)	
Storage Humidity	5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)	
Vibration Resistance	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	
Shock Protection	half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)	
Mechanical Dimensions (W x H x D) mm	73mm x37.26 x 171mm		73mm x37.26 x 171mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm		73mm x37.26 x 171mm	
Weight	0.45kg		0.45kg	0.45kg	0.65kg		0.4kg	0.45kg

Model Name	NMC-1008		NMC-1009	NMC-1010	NMC-4001		NMC-4005	NMC-4006
NMC Type	Thumbscrew Latch(available)		Thumbscrew	Thumbscrew	Handle	Thumbscrew	Handle Thumbscrew (available)	Handle Thumbscrew (available)
Part Number	NMC-1008-02FBSSA1	NMC-1008-02FBLSA1	NMC-1009-02FSA1	NMC-1010-02FBSSA1	NMC-4001E	NMC-4001-04FSA1	NMC-4005-000010E	NMC-4006-000010E
Status	MP		MP	MP	MP		MP	MP
Life Cycle	2021 Q1		2023	2023	2021 Q1		2023	2023
Chipset	1x 82599ES		1x XL710	1x X710	2x 82599ES		Intel XL710	Intel XL710
Speed	10G		10G	10G	10G		10G	40G
Network Interface (connector type)	2 Fiber LC(SR)	2 Fiber LC (LR)	2 Fiber(SFP+)	2 Fiber(LC)	4 Fiber(SFP)		4 Fiber(SFP)	2 Fiber QSFP
PCIe	1x PCIe x8, Gen2		1x PCIe x8, Gen3	1x PCIe x8, Gen3	1x PCIe x8, Gen2		1x PCIe x8, Gen3	1x PCIe x8, Gen3
LAN Bypass (Legacy/Advanced)	Fiber bypass		NA	Fiber bypass	NA		NA	NA
Present Pin Detection	YES		YES	Yes	YES		YES	YES
LAN LED Definition	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **BYPASS LED (middle LED)** BYPASS: Amber on DISCONNECT: Amber blinking CONNECT: N/A		**SFP Connector** Link/Act LED: Speed link 1000: Green Act: Green blinking	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **BYPASS LED (middle LED)** BYPASS: Amber on DISCONNECT: Amber blinking CONNECT: N/A	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking		**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking
Power	Voltage	+12V ± 15%		+12V ± 15%	+12V ± 15%	+12V ± 15%		+12V ± 15%	+12V ± 15%
	Consumption	15W		15W	15W	15W		15W	15W
Environment	Operating Temperature (air flow 0.7 m/sec)	-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)		-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)
	Storage Temperature	-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)		-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)
	Storage Humidity	5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)		5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)
	Vibration Resistance	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis		1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
	Shock Protection	half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)		half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)
Mechanical	Dimensions (W x H x D) mm	73mm x37.26 x 171mm		73mm x37.26 x 171mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm		73mm x37.26 x 171mm	73mm x37.26 x 171mm
	Weight	0.65kg	0.7kg	0.5kg	0.7kg	0.38kg	0.45kg	0.55kg	0.55kg

Model Name	NMC-4007	NMC-4008	NMC-4009	NMC-6002	
NMC Type	Thumbscrew Latch (available)	Thumbscrew Latch (available)	Thumbscrew	Latch	Thumbscrew
Part Number	NMC-4007-04FBSSA1	NMC-4008-000110E	NMC-4009-04CSA1	NMC-60 02FD-02A1L	NMC-6002-02FSA1
Status	MP	PVT	MP	MP	PVT
Life Cycle	2023	2023	2023	2022 Q2	
Chipset	Intel XL710	1x Intel XL710-BM2	2x Intel x550	1 x Mellanox ConnectX-4	
Speed	10G	40G	10G	100G	
Network Interface (connector type)	4 Fiber(LC)	2x QSFP 40G type	4x 10G-BASET(RJ45)	2 Fiber (QSFP28)	
PCIe	1x PCIe x8, Gen3	1x PCIe x8, Gen3	1x PCIe x8, Gen3	2 x PCIe X8, Gen3	
LAN Bypass (Legacy/Advanced)	Advanced LBP: (Micro_P 8051) -Bypass, Normal, Disconnect	Advanced LBP: (Micro_P 8051) -Bypass, Normal, Disconnect	NA	NA	
Present Pin Detection	YES	YES	YES	YES	
LAN LED Definition	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **BYPASS LED (middle LED)** BYPASS: Amber on DISCONNECT: Amber blinking CONNECT: N/A	**Link / Act LED (Right/Left)** Link: Green on Active: Green Blinking **BYPASS LED (middle LED)** BYPASS: Amber on DISCONNECT: Amber blinking CONNECT: N/A	**Speed LED (Left)** 10: N/A 100: Amber (downgrade speed) 1000: Green (Maximum speed) **Link / Act / Bypass LED (Right)** Link: Green on Active: Green Blinking LAN Bypass: Amber on Disconnect: Amber blinking	**Link / Act LED** Link: Green on Active: Green Blinking	
Power	Voltage	+12V ± 15%	+12V ± 15%	+12V ± 15%	+12V ± 15%	
	Consumption	15W	18W	12W	34.85W	
Environment	Operating Temperature (air flow 0.7 m/sec)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	-5°C ~ 45°C (23°F~113°F)	
	Storage Temperature	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	-20°C ~ 65°C (-4°F~149°F)	
	Storage Humidity	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	5 ~ 85 % @ 60° C (140° F)	
	Vibration Resistance	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1. Test PSD: 0.026 G /Hz, 2.16 Grms 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	
	Shock Protection	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	half sine 10G with package (x y z axis)	
Mechanical	Dimensions (W x H x D) mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm	73mm x37.26 x 171mm	147.4mm x 36.3mm x 187.6mm	
	Weight	0.7kg	0.7kg	0.5 kg	0.5 kg	

Model Name	PCIe-3020				PCIe-3021	PCIe-3030	PCIe-3031
Part Number	PCIe-3020NA-00A1E	PCIe-3020NP-01A1E	PCIe-3020NP-02A1E	PCIe-3020NP-03A1E	PCIe-3021-00E	PCIe-3030	PCIe-3031
Status	MP	PVT	MP		MP	DVT	DVT
Life Cycle	2021 Q1				2021 Q1	2023	2023
Chipset	Coleto Creek				Coleto Creek	Lewisburg	Lewisburg
Description	Dual 8950 w/ Active heatsink				Dual 8955 w/ Passive heatsink	LBG-E(C625) LBG-M(C626) LBG-T(C627)	LBG-T(C627)
Network Interface (connector type)	PCIe				PCIe	PCIe	PCIe
Form type	Standard PCIe card				Proprietary PCIe card	Standard PCIe card	Standard PCIe card
PCIe	PCIe gen3. x8				PCIe gen3. x16	PCIe gen3. x8	PCIe gen3. x16
HeatSink	Active	Passive			Passive	Passive	Passive
LAN Bypass (Legacy/Advanced)	NA				NA	NA	NA
Present Pin Detection	NA				NA	yes	yes
LAN LED Definition	NA				NA	NA	NA
Power — Voltage	+12V ± 15%				+12V ± 15%	+12V ± 15%	+12V ± 15%
Power — Consumption	50W	30W		27W	52W	20W	20W
Environment — Operating Temperature (air flow 0.7 m/sec)	0°C ~ 40°C (32°F~104°F)				0°C ~ 40°C (32°F~104°F)	0°C ~ 50 °C (32°F~122°F)	0°C ~ 50 °C (32°F~122°F)
Environment — Storage Temperature	-40°C ~ 70°C (-40°F~158°F)				-40°C ~ 70°C (-40°F~158°F)	-40°C ~ 70°C (-40°F~158°F)	-40°C ~ 70°C (-40°F~158°F)
Environment — Storage Humidity	95 % @ 40° C (140° F)				95 % @ 40° C (140° F)	95 % @ 40° C (140° F)	95 % @ 40° C (140° F)
Environment — Vibration Resistance	1.0.5Grms (operating); 2.16Grms (Non operating) 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis				1.0.5Grms (operating); 2.16Grms (Non operating) 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1.0.5Grms (operating); 2.16Grms (Non operating) 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis	1.0.5Grms (operating); 2.16Grms (Non operating) 2. System condition: Packaged mode 3. Test Frequency: 5-500Hz 4. Test Axis: X, Y and Z axis
Environment — Shock Protection	4G each axis(Operating); 20G each axis(Non-operating)				4G each axis (Operating); 20G each axis (Non-operating)	4G each axis (Operating); 20G each axis (Nonoperating)	4G each axis (Operating); 20G each axis (Nonoperating)
Mechanical — Dimensions (W x H x D) mm	60 x20 x 195mm				86 x15 x 125mm	68.9*20*132.3 mm	68.9*20*132.3 mm
Mechanical — Weight	0.37kg				0.35kg	0.35kg	0.35kg

Memo

Memo

Global Access, Local Support

Map legend:

- **D** Design Centers
- **M** Manufacturing Centers
- **C** Configure To Order Service Centers
- **L** Logistics Centers
- **O** Onsite Service
- **R** Repair Centers

Map locations:

Moscow (R), Eindhoven (C L), Newcastle (D), Seoul (C L R), Tokyo (C L R), Warsaw (R), Beijing (D C L O R), Milpitas (C L R), Irvine (D), Cincinnati (D), Kunshan (D M C L R), Amberg (D), Bangkok (C), Taipei (D M C L O R), Bangalore (C R), Penang (C), Monterrey (R), Itajubá (C L R), Singapore (C L R), Melbourne (C L R)

Other map labels: St. Petersburg, Roosendaal, Paris, Milan, Düsseldorf, Munich, Mexico, Chengdu, Pune, Shanghai, Osaka, Nagoya, Hong Kong, Shenzhen, Kuala Lumpur

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