2020

PUZZLE Series

Next-Gen Network Appliance

iEi®

www.ieiworld.com

IEI PUZZLE Series Products

Aiming to The Future with Next Generation Network Appliance

IEI PUZZLE series is the next generation product of network appliance which includes a broad portfolio of x86-based and ARM-based network platform built with the latest generation Intel, AMD, Marvell, NXP or Cavium processors, and Aquantia, Intel, Broadcom, Mellanox network interface controllers. These products are built for proprietary network appliance and uCPE (Universal Customer Premise Equipment).

Proprietary Network Appliance

A Proprietary network appliance is a specialized electronic device that plugs into a network that is optimized for one specialized network purpose like switching, routing, protecting in a network environment. Proprietary network appliances include as Router, Load Balance, Bandwidth Management, Gateway security, WAN Optimization, application delivery controller (ADC), Next Generation Firewall (NGFW), Unified Threat Management (UTM), and Intrusion detection system (IDS).

uCPE (Universal Customer Premise Equipment)

uCPE consists of virtual network functions (VNFs) running on a standard operating system hosted on an open server with NFV technology.

Now with NFV technology, we can create several virtual machines and install these VNFs in a x86 or ARM based uCPE. VNFs could include popular software services such as a virtual firewall, virtual load-balancing, or other software-defined wide area network (SD-WAN)service. Besiads with NFV Orchestration, uCPU could be an edge computing system or an AI inference computing system.

PUZZLE is Ready for Proprietary Network Appliance

Unified Threat Management (UTM)

Unified threat management or UTM is a single network appliance for all-inclusive security functions, such as network firewall, intrusion detection/prevention system (IDS/IPS), anti-virus gateway, anti-spam gateway, VPN, content filtering, load balancing, data loss prevention and appliance monitoring.

UTM appliances offer cost-effective, all-in-one security ideal for small/medium businesses, remote offices and retail networks.

Intrusion Detection System (IDS)

An intrusion detection system (IDS) is a device that monitors a network or systems for malicious activity or policy violations. Any malicious activity or violation is typically reported either to an administrator or collected centrally using a security information and event management (SIEM) system. A SIEM system combines outputs from multiple sources, and uses alarm filtering techniques to distinguish malicious activity from false alarms.

Application Delivery Controller

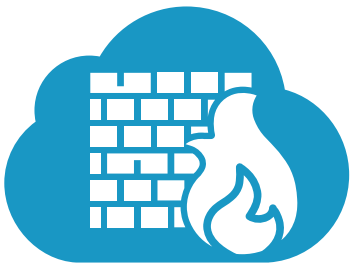
An application delivery controller (ADC) is a computer network device to improve the performance of web applications in a data center and it also could be a part of an application delivery network (ADN). In order to deal with the increasing demands of Internet traffic, application delivery controllers (ADC) also provide load balancing, and support multi-tenancy for deployment in data centers and a large number of sessions with a fast transaction rate.

Wireless Gateway

A wireless gateway routes packets from a wireless LAN to another network, wired or wireless WAN. It may be implemented as software or hardware or combination of both. Wireless gateways combine the functions of a wireless access point, a router, and often provide firewall functions as well. They provide network address translation (NAT) functionality, so multiple user can use the internet with a single public IP. It also acts like a dynamic host configuration protocol (DHCP) to assign IPs automatically to devices connected to the network.

WAN Optimization

WAN optimization or WAN acceleration is a collection of techniques to enhance the efficiency of data flow across a wide area network (WAN). The goal of WAN optimization is to speed up the data transfer, to reduce latency and insure bandwidth of access to critical applications and information. The most common industrial WAN connection is from branch to headquarters.

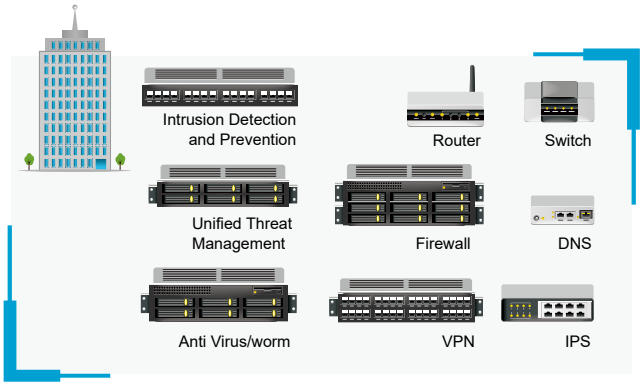


Next Generation Firewall (NGFW)

Both NGFW and traditional firewalls aim to serve the same purpose of protecting an organization's network and data assets, but the most important differences between traditional and next-generation firewalls is that NGFW offer a deep-packet inspection function that goes beyond simple port and protocol inspection by inspecting the data carried in network packets.

PUZZLE's uCPE Application

In a virtual CPE (vCPE) model, all the network functions can be consolidated using software-based virtual network functions (VNFs) running on top of a single universal CPE (uCPE) appliance. The VNFs may reside inside an on-site hardware device, in an enterprise data center, or in the cloud. Both businesses and service providers can easily operate IEI PUZZLE series.

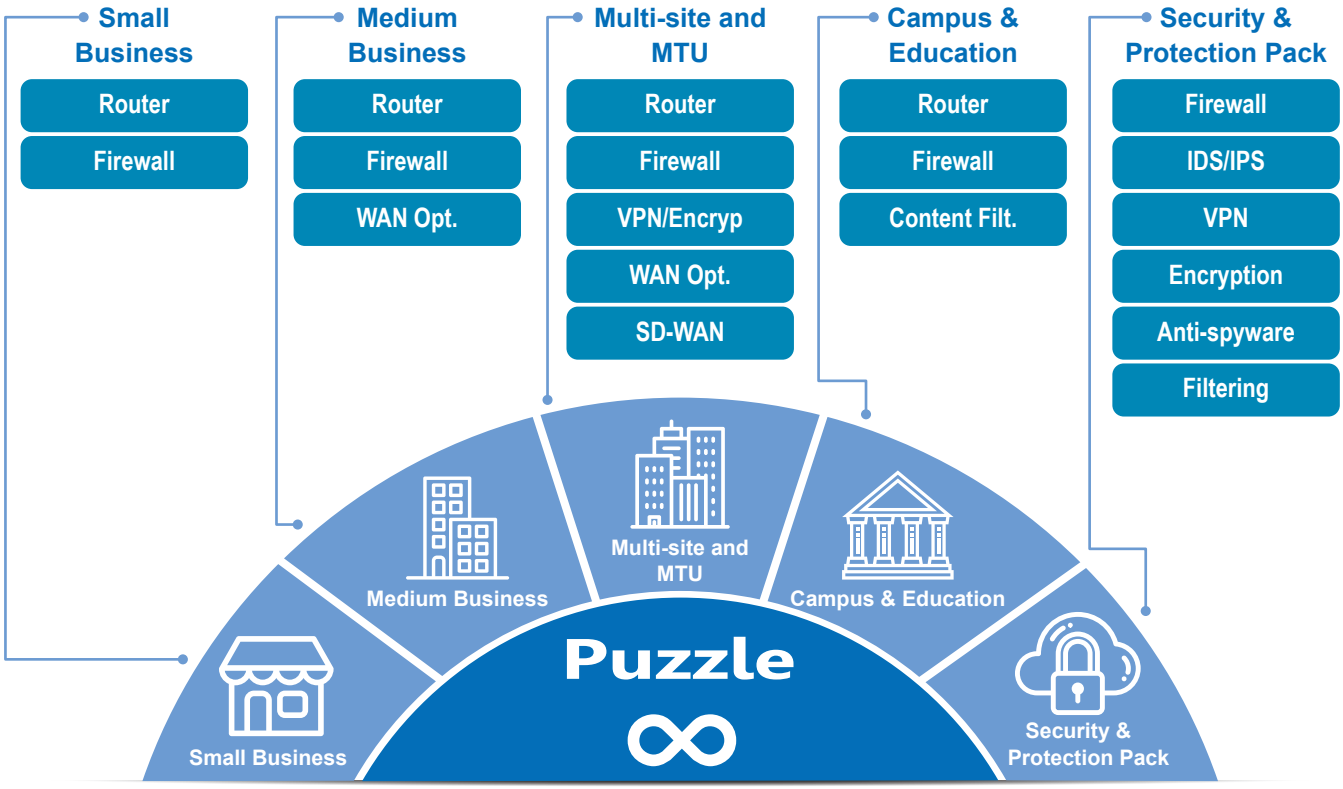


PUZZLE Designed for Every Environment

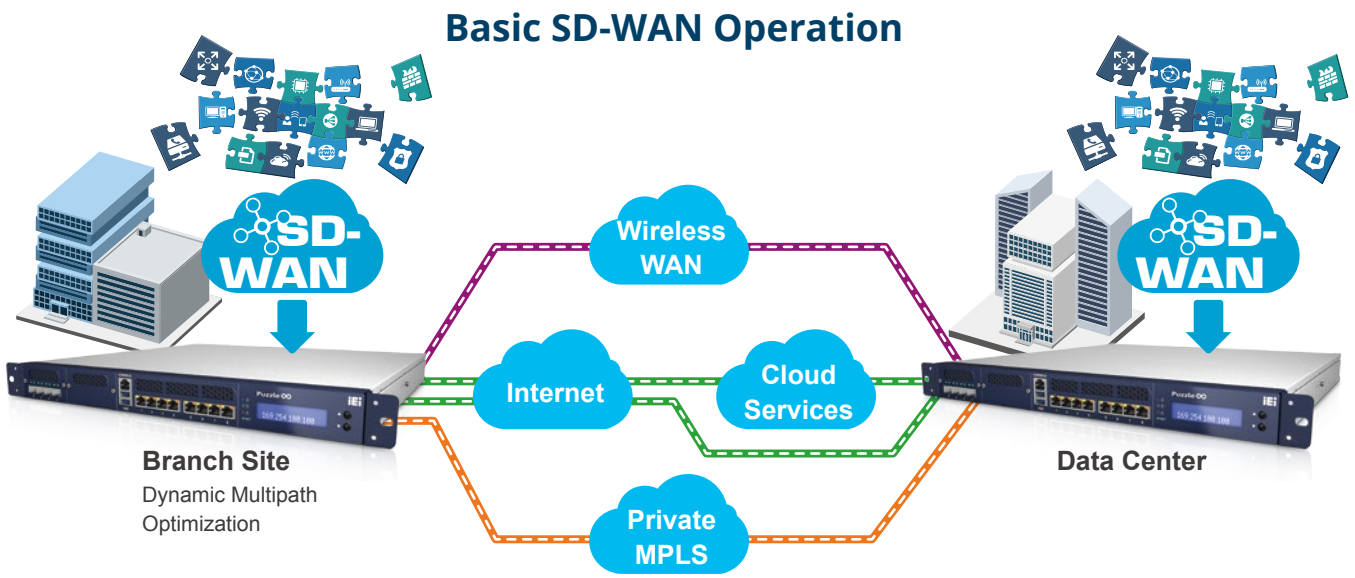
The PUZZLE series can be used in different environment, from small company to global corporations. Firewall and router are software that is basically used in uCPE, and are ones of the most important software with high usage. Each kind of software is built based on network security and communication system to avoid external attacks. By using SD-WAN (Software-Defined WAN), the problem of insufficient performance and security can be solved at the same time. With simple and easy-to-use programming functions, central device management can be achieved to provide enterprises a full line of protection.

PUZZLE Designed for SMB or Enterprise Application Environment

One of the commercially viable applications for NFV is the area of Universal Customer Premise Equipment (uCPE). The PUZZLE series uCPE allows customer service providers to offer their SMB or enterprise functions as VNFs more commonly on a purpose-built device running at the customer premises. Generally, the most applicable enterprise services managed in uCPE include router, firewall, WAN optimization, and SD-WAN.



SD-WAN Application



SD-WAN service revenues will see a compound annual growth rate (CAGR) of 69.6% and reach $8.00 billion in 2021

uCPE in Telecom & Network Operators

Nowadays, telecom and network operators can build network services by deploying VNFs on a uCPE. There are several advantage of uCPE, that is why uCPEs become more and more popular.

This model allows Telecom & Network Operators to deploy services more quickly and with more flexibility and save a lot of money.

Service providers simplify customer site deployments by using a panoply of dedicated appliances with VNFs running on a single universal platform.

Lower CapEx & OpEx

Reduce the Consumption of CapEx and OpEx including for management time and effort, maintenance and contracts or software licensing etc.

Standard Hardware

Open Source Software

Open source software reduces time to market and the risk of vendor lock-in.

uCPE

Lower Power Consumption

uCPE can run several VNFs to build up a network enviroment instead of running several phycial network appliances. Running an uCPE can save engergy.

Various Solutions

The true value of openness comes from being able to combine a mix of open source and proprietary software components to deliver an innovative service.

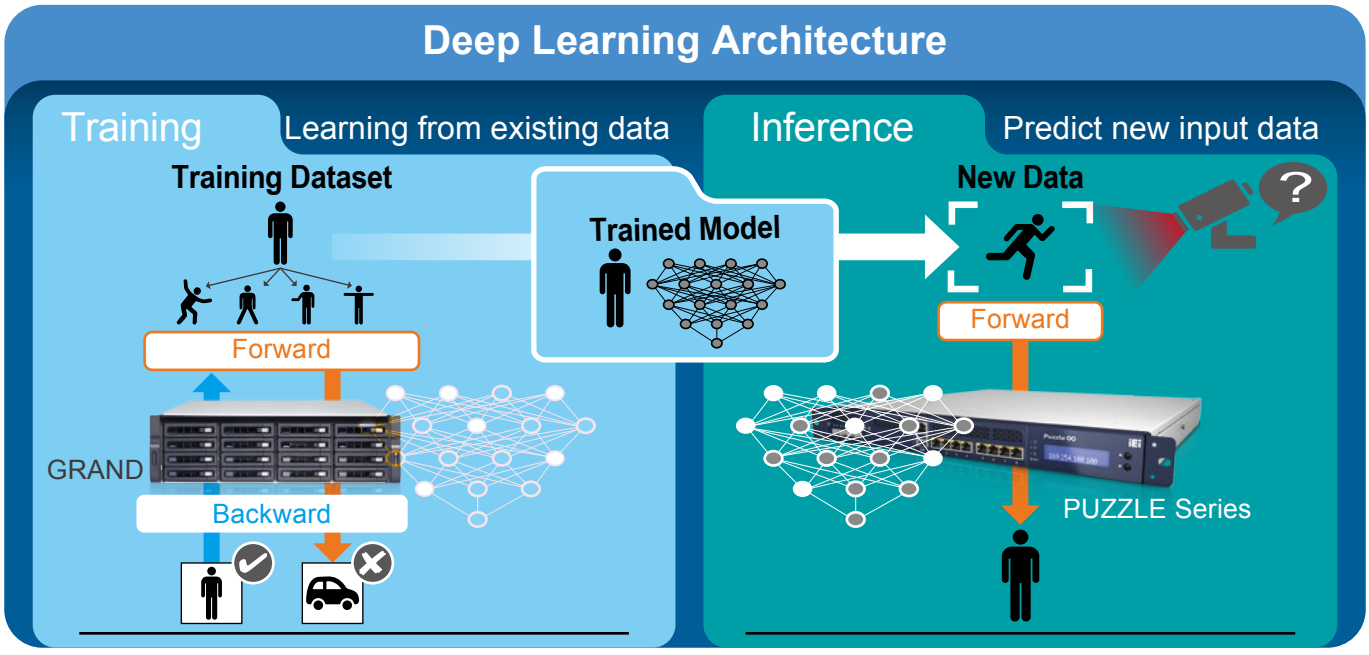
Flexible

The uCPE helps service providers and their customers from suffering hardware vendor lock-in. It creates the flexibility of manageability through NFV.

Edge Computing & AI Inference Computing

How Does Deep Learning Work?

Deep learning is a machine learning technique that can learn useful representations of features directly from images, test and sound. There are two phases, training and inference. The training servers designed for AI creates patterns and algorithms from the dataset, and each layer of data is assigned some random weights and your classifier runs a forward pass through the data, predicting the class labels and scores using those weights, after the training model is built, that will be applied into systems that are able to predict the result, this is what inference systems do.



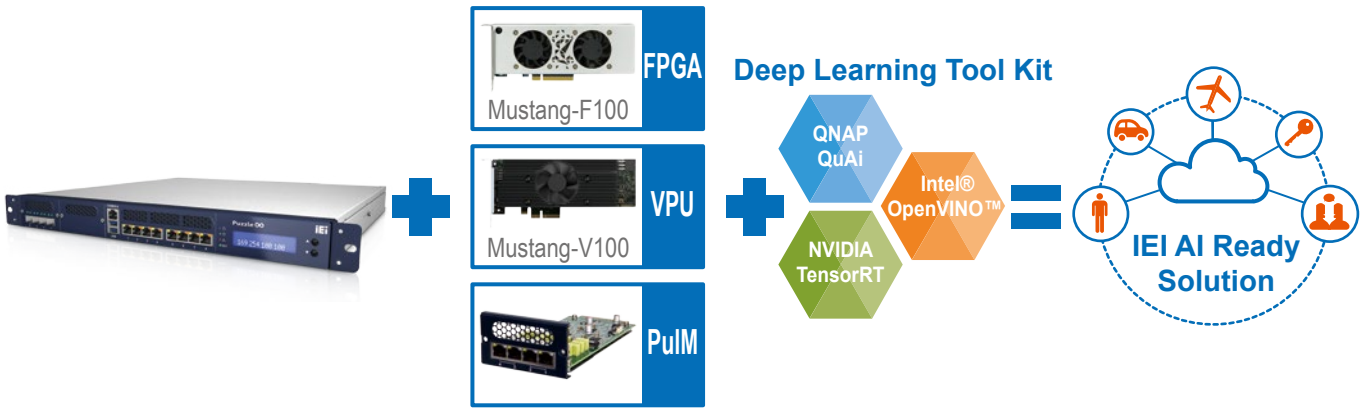
Achieving AI with IEI Deep Learning Solution

The most likely markets to adopt AI technologies will be medicine, biology, media, security, defense and transportation. Each market faces a variety of challenges, for example, transportation traffic flow prediction heavily depends on historical and real-time traffic data collected from various sensor sources, including inductive loops, radars, cameras, etc. It is difficult to find a safe and reliable hardware for the kind of harsh and strict environment.

Therefore, IEI introduces the PUZZLE series which is specifically designed not only for network appliance but also for edge computing and AI inference system, and features modularized, rich interconnectivity, and powerful computing capability. For instance, the PUZZLE-IN001 is equipped with workstation-class Intel® C246 chipset, cutting edge technology, eight GbE ports and two network module slots which support 25GbE, 10GbE interface for transferring huge amount of data. In addition, various add-on card interfaces such as PCIe 3.0 slots, PCIe Mini card slot and M.2 slot are provided for customers to add acceleration cards like VPU, FPGA, GPU cards to increase the computing power. IEI PUZZLE series is perfect to be used as AI inference systems or edge computing systems.

IEI AI Ready Solution Accelerates your AI Initiative

PUZZLE series is an AI hardware ready system ideal for deep learning inference computing to help you get faster, deeper insights into your customers and your business. IEI's PUZZLE series supports graphics cards, Intel FPGA acceleration card, and Intel VPU acceleration card and provides additional computational power and end-to-end solution to help run your tasks more efficiently. With the NVIDIA TensorRT, QNAP QuAI, and Intel OpenVINO AI development toolkit, it helps you deploy your solutions faster than ever.



What is an NFV Orchestration?

Network functions virtualization (NFV) Orchestration (or NFV Orchestration) is used to coordinate the resources and networks needed to set up cloud-based services and applications. This process uses a variety of virtualization software and industry standard hardware. Cloud service providers or global telecom operators use NFV orchestration to quickly deploy services, or virtual network functions (VNFs), using cloud software rather than specialized hardware networks.

With NFV Orchestration technology, we can remotely and quickly deploy VNFs, edge computing software and AI inference trained model into the uCPU-based IEI PUZZLE series products.

Only two steps are needed to create an edge computing or AI inference computing system with the PUZZLE series.

First

Deploy VNFs in the PUZZLE to create network connection ability and security protection.

Second

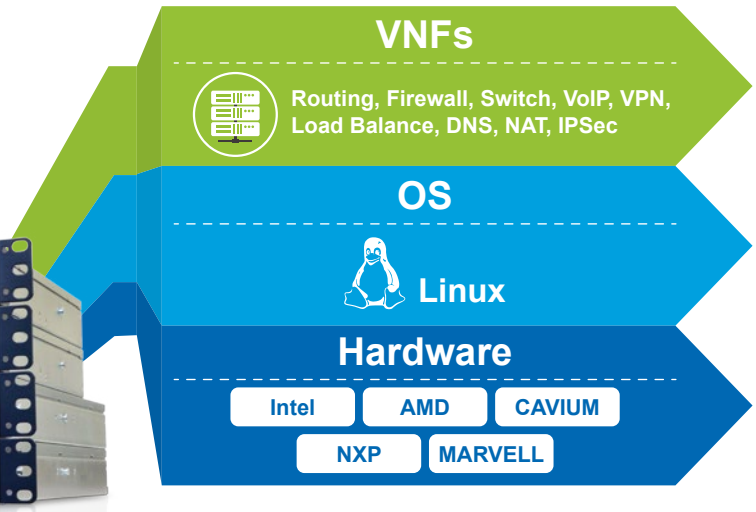
Deploy edge computing software & AI inference trained model to the PUZZLE.

PUZZLE Series Technology

Virtualization is the process of creating a software-based, or virtual, representation of something, such as virtual applications, servers, storage and networks. Network functions virtualization or NFV is a network architecture concept that uses the technologies of IT virtualization to virtualize entire classes of network node functions into building blocks that may connect, or chain together, to create communication services.

PUZZLE Series Ecosystem

PUZZLE is about the uCPE consisting of software virtual network functions (VNFs) running on a standard operating system hosted on an open server. An ideal uCPE deployment supports a multi-vendor multi-component construction and enables rapid development as well as open multi-vendor systems.



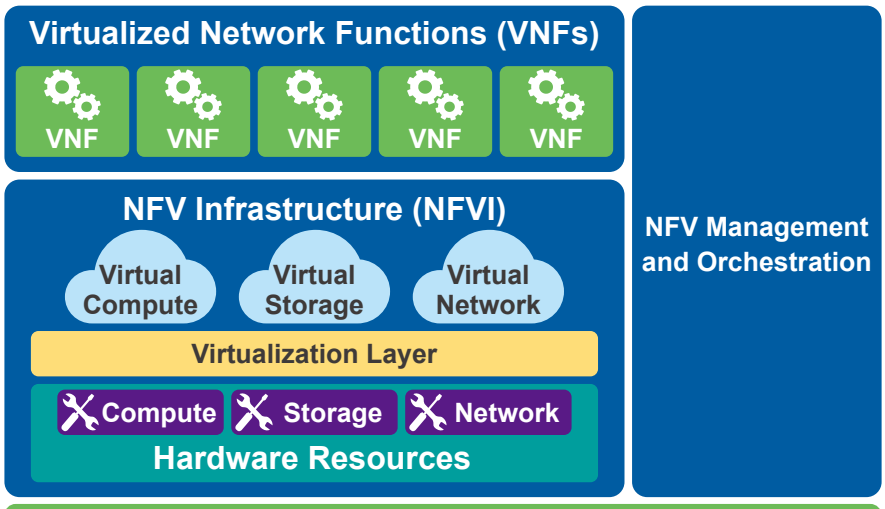
Universal CPE (uCPE) is one of the most compelling use cases of Network Function Virtualization (NFV) currently attracting the interest of hosted service providers. uCPE provides a remotely manageable platform on which hosted service providers can easily deploy, modify or delete VNFs over Wide Area Networks (WAN).

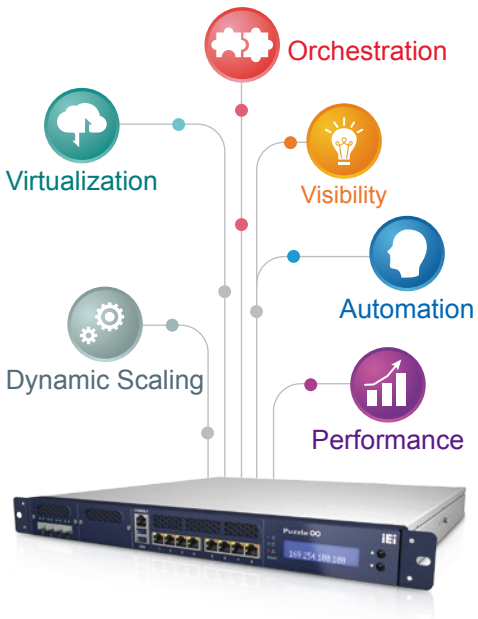
The PUZZLE system can provide an open universal customer premises equipment (uCPE) solution that offers real-time software-defined wide-area network (SD-WAN) services that support both Intel x86 and ARM architectures with any additional virtual network functions (VNF) services.

What is NFV?

Advantages of NFV on the PUZZLE's series

NFV (Network Functions Virtualization) is network architecture concepts that using IT virtualization related technologies, to virtualize entire classes of network node functions into building blocks that may be connected, or chained, together to create communication services. Its purpose is to take your traditional hardware network devices (routers, switches, firewalls, etc.) and deploy them virtually, like computer running as a virtual machine.

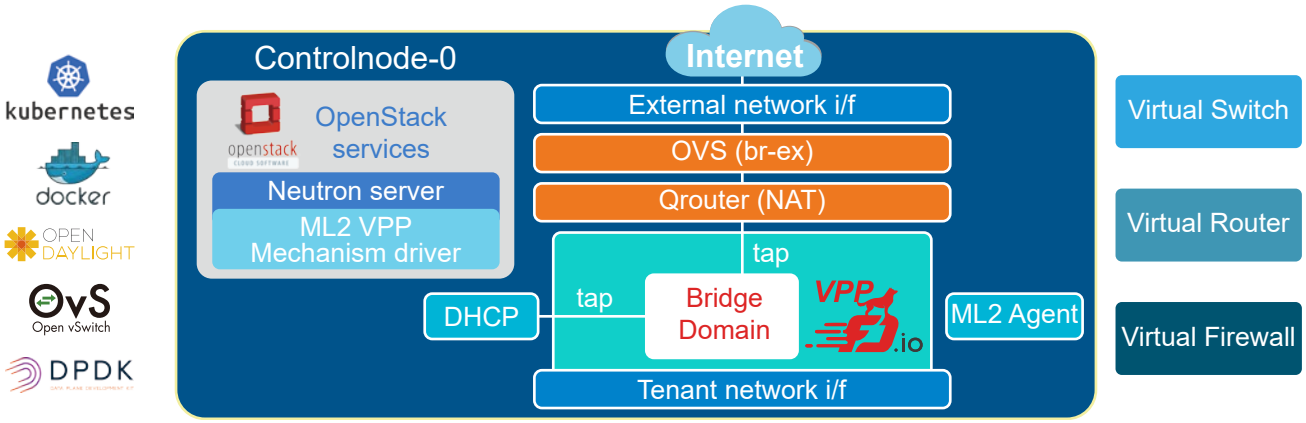




VNF (virtualized network functions) refers to the implementation of a network function using software that is decoupled from the underlying hardware. Software is implementation of NFV that can be deployed in a virtualized infrastructure.

Support NFV Technology

IEI uCPEs have been verified with NFV (Network Functions Virtualization) software testing tools based on open source. With the test and verification, IEI uCPEs are ready to implement DPDK (Data Plan Development Kit), OVS (Open vSwitch), or VPP (Vector Packet Processing), which can be installed on OpenStake to create virtual machines and containers. Once the virtual machines and containers are created, it is easy to deploy VNFs (Virtual Network Functions) and to create vFirewall, vRouter, vSwitch, and SD-WAN as needed.



What is SD-WAN?

The software-defined wide-area network (SD-WAN) is a specific application of software-defined networking (SDN) technology. It adds app-layer intelligence and service chaining in WAN connections within enterprise networks, including headquarter, branch offices and data centers. SD-WAN connectivity can be delivered as service using software orchestration.

SD-WAN is appealing because it is a replacement for traditional WAN routers and supports transport technologies like MPLS, Internet, and LTE. SD-WAN also allows load sharing of traffic across multiple WAN connections making it more efficient.

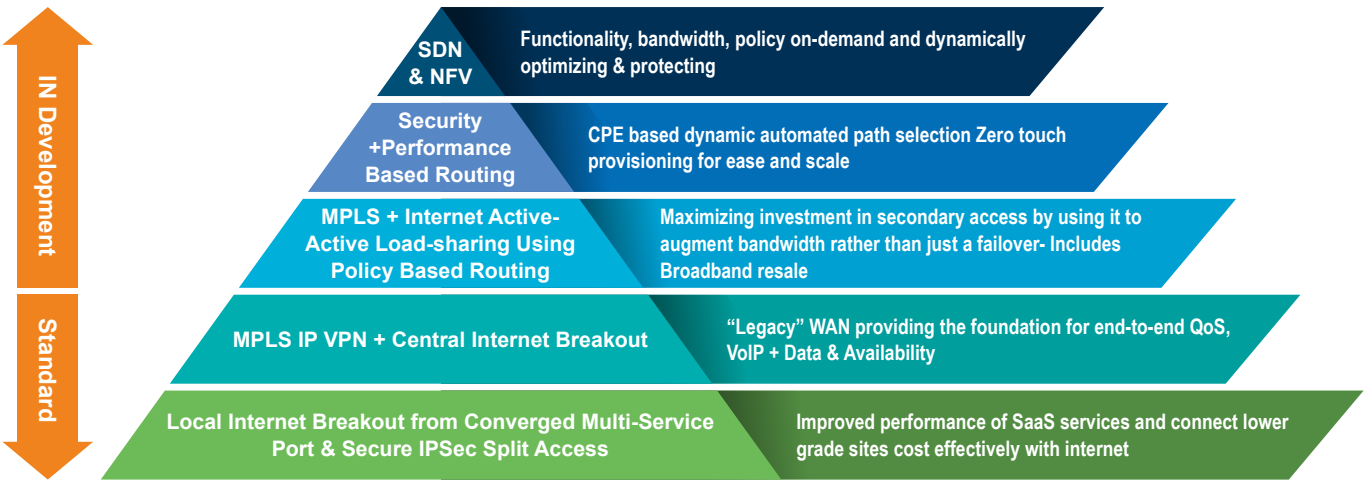
SD-WAN Benefits of PUZZLE's Series

One of the main benefits that most enterprises deploy SD-WAN is that it can reduce their WAN costs by up to 90 percent because it supplements or replaces dedicated private WAN networks, which usually are MPLS, with regular broadband connectivity.

That same cost-benefit can be applied to SD-WAN as a Service. By using this, enterprises can get the flexibility and cost savings of SD-WAN and at the same time minimize the headache of managing the infrastructure and connectivity.

SD-WAN Basic Architecture

The common point between SD-WAN and hybrid WAN is that they both can combine multiple external connections, for example, Internet and wireless network. But the difference between them is SD-WAN allows automated, programmable network management. Thus, traffic can be automatically and dynamically transferred based on network status, security, and service quality requirements.

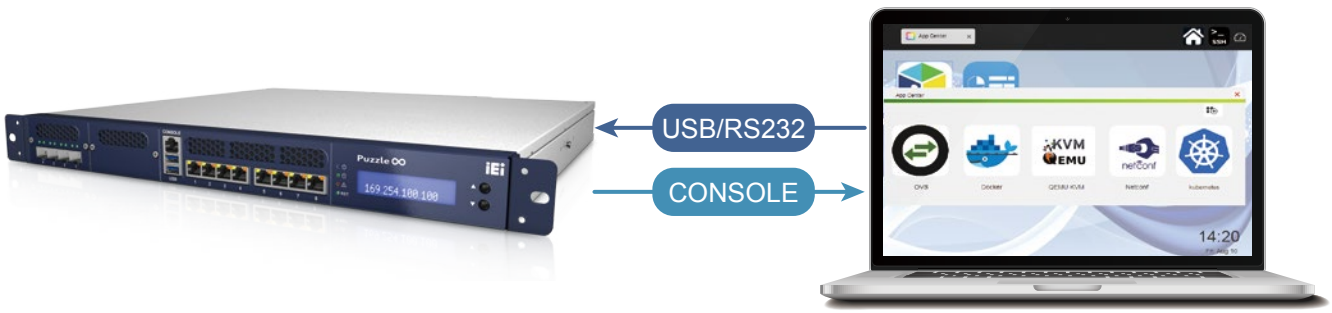


PUZZLE Software Introduction

PUZZLE Finder Software AP

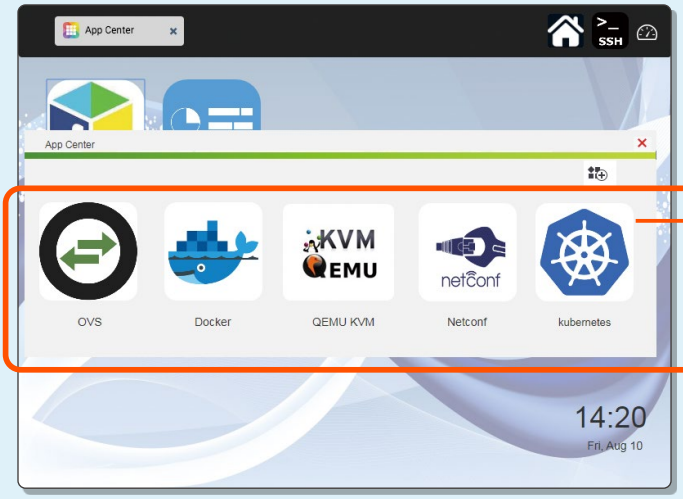
Use your PC/Laptop as a development environment.

After installing Ubuntu 16.04 on your PUZZLE, you can install the PUZZLE Finder application on your PC/Laptop. PUZZLE Finder can help users quickly develop environment and network applications, and allow them to perform PUZZLE system management, resource monitoring, version maintenance, software installation, software update and gaining information of CPU, memory, Internet, etc.



Easy to Install

The APP center provides the most popular and configured applications.



Eliminate cumbersome installation steps; choose the APP you want to install. The APP can be downloaded and automatically installed. You can immediately enjoy the benefits of the software.

Utilize Virtual Technology, Create Unlimited Value

Docker containerization unlocks the potential for Dev and Ops. Freedom of choice, agile operations and integrated security for legacy and cloud-native applications. Implement Docker Lightweight Micro Services on the IEI PUZZLE.

Installing the Open vSwitch (OVS) can implement domain cutting, QoS, data monitoring, and support openFlow.

Provide a more efficient Linux virtualization solution. Enhance the efficiency of virtualization by enhancing the operating mode of the CPU through QEMU-KVM.

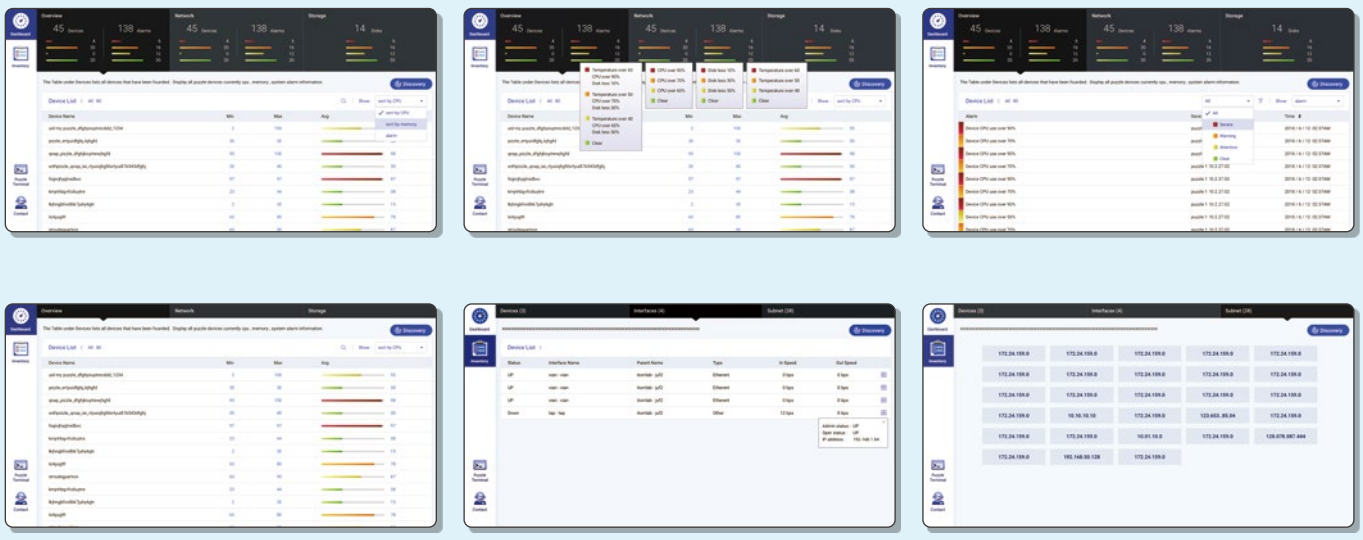
Automate network configuration with Netconf; accelerate network equipment and services in enterprise in order to lower the cost.

Kubernetes is a system that helps us automate the deployment, expansion, and management of containerized applications.

PUZZLE System Status Monitoring

Graphical user interface allows you to easily get an overview of the PUZZLE system and monitor resource status of each PUZZLE system you have.

User Interface



PUZZLE & PulM Series Introduction

IEI PUZZLE Series for Network Appliances

IEI PUZZLE series includes x86-based and ARM-based product solutions. x86 systems adapt Intel or AMD CPU; ARM-based systems adapt Marvell, NXP or Cavium SoC. Each CPU & SoC has its own advantage for network appliances. For example, Intel is the most popular chip maker and provides complete driver support; AMD provides high performance; ARM-based SoC provides special HW offload for networking function such as packet processor and datapath acceleration.

It is easy to choose the right network appliance or uCPE solution from IEI PUZZLE series.

IEI PUZZLE Series – Processor Options

	X86		ARM		
Brand	**Intel**	**AMD**	**MARVELL**	**NXP**	**CAVIUM**
Platform	Coffee Lake/ Skylake/ Denverton	EPYC 3000 R-Series SoC	Armada 8040 Armada 7040	QorIQ® LS2088	OCTEON CN8300
Advantage	• Most popular • Stability • Complete driver support • Easy to develop	• High core count • High performance • Secure encrypted virtualization • Secure memory encryption	• Quad Cortex-A72 cores • Packet processor • 10GbE integrated • Low cost	• Eight to four Cortex-A72 cores • Packet processor • Datapath acceleration • 10GbE integrated	• Up to 24 Cortex-A72 cores • Packet processor • HW offload for networking • 10GbE integrated • Low cost

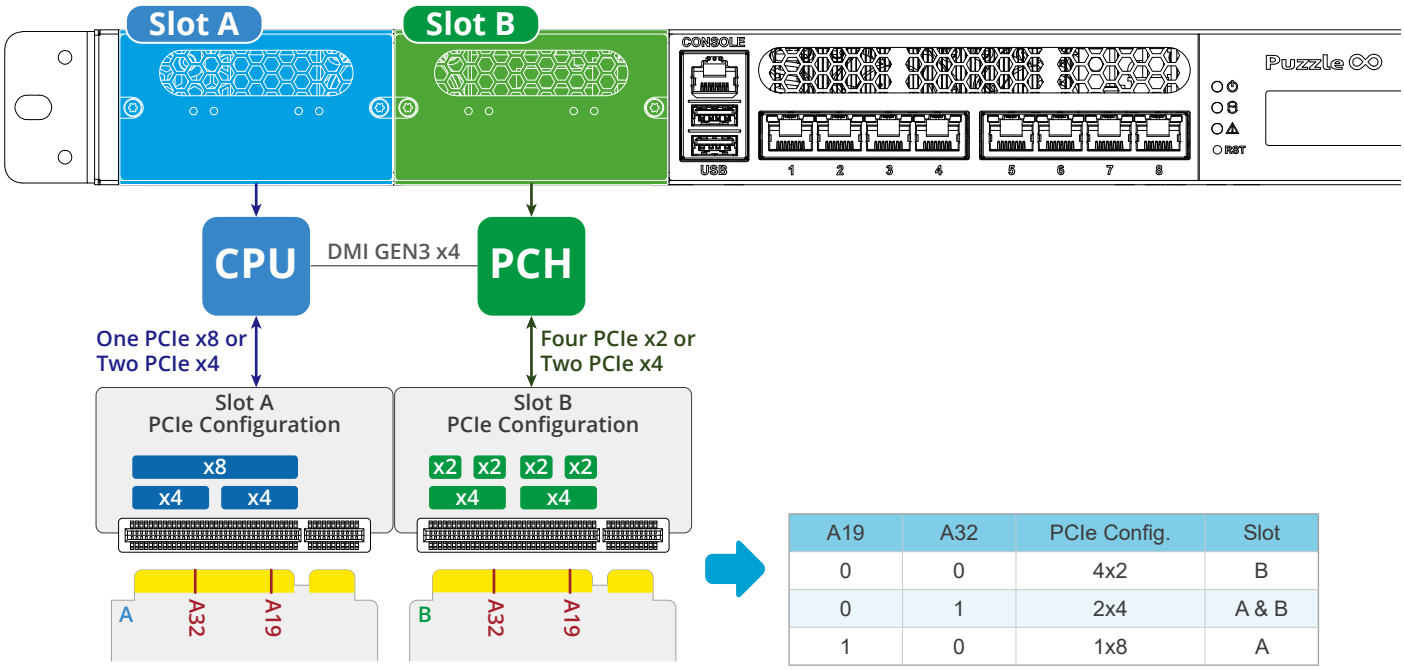
IEI PuIM Series – Smart NIC Option

Smart NIC is getting more and more important. It not only increases the performance of system but also provides special functions like virtualization technology and packet processing. It is ideal for users who want to, for instance, build up a network server with virtual machine and provide storage function.

Offload Function		Mellanox	Intel	BROADCOM	AQUANTIA
CPU Offload	LSO	Y	Y	Y	Y
	TSO	Y	Y	Y	
	RSS	Y	Y	Y	Y
	HDS	Y		Y	Y
	MSI-X	Y	Y	Y	Y
Storage Offload	iWARP		Y		
	iSER	Y	Y	Y	
	VEPA		Y	Y	
	NFS RDMA	Y	Y	Y	
	uDAPL	Y		Y	
Virtualization Support	VxLAN	Y	Y	Y	
	NetQueue	Y		Y	
	GENEVE	Y		Y	
	IEEE 802.1Qbg	Y	Y	Y	
	SR-IOV	Y	Y	Y	

Hardware Installation

Install the IEI PuIM networking module into the slot of the PUZZLE series. The Slot A supports 8 lanes from CPU (one PCIe x8 or two PCIe x4); the Slot B supports two PCIe x4 or four PCIe x2 from PCH.



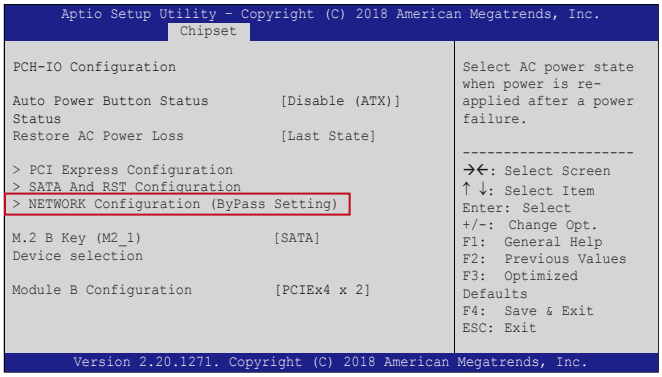
A19	A32	PCIe Config.	Slot
0	0	4x2	B
0	1	2x4	A & B
1	0	1x8	A

Bypass Configuration in BIOS

Some PulM modules support bypass. To enable/disable bypass function, configure the BIOS menu of the PUZZLE series as described below.

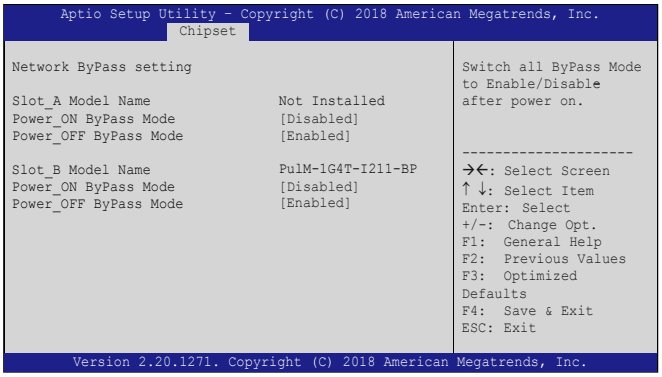
Step 1

Go to Chipset ➔ PCH - IO Configuration ➔ NETWORK Configuration (Bypass Setting)



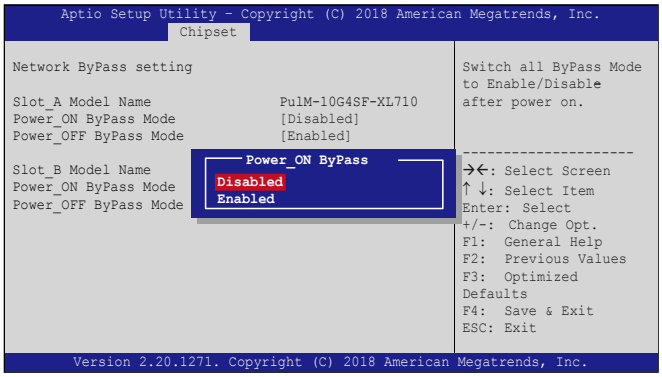
Step 2

The Network ByPass Setting menu appears. The model names of the PulM module installed in the PUZZLE series are shown.



Step 3

Configure the Power_ON ByPass Mode and the Power_OFF ByPass Mode BIOS options to enable/disable bypass function of the installed PulM modules.



PUZZLE System	Power_ON Bypass Mode		Power_OFF Bypass Mode	
BIOS Setting	Disabled	Enabled	Disabled	Enabled
PulM Bypass Modules	Close	Open	Close	Open

Step 4

Press F4 to save and exit the BIOS menu. The PUZZLE series will reboot with the new settings.

IEI PUZZLE Series is Ready for Next Generation Network

The following picture completely shows the components of the PUZZLE series. Choose the right components from CPU, NIC, software, manufacturing side, and fit them together. You will create a perfect network appliance.

Software/ Application

On the left hand side, it shows the S/W support from IEI. IEI will help customers to get device driver, application, other NFV basic software, DPDK, OvS, VPP, OpenDaylight and OpenStack. IEI will also help customers to deploy and install all of the software and build up their own NFV solutions.

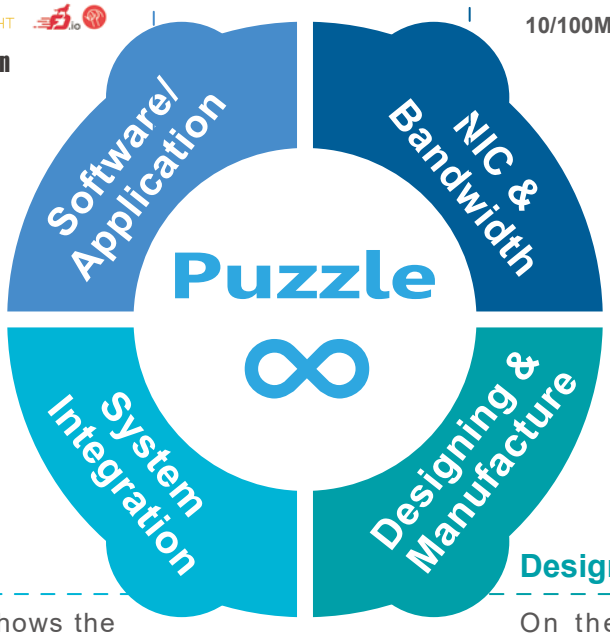
Device Driver Application

NIC & Bandwidth

On the upper side, it shows the network connection ability of the PUZZLE series.

IEI provides four brands of NIC from Aquantia, Intel, Broadcom, Mellanox, and with 1G, 2.5G, 5G, 10G or 25G different kinds of speed.

10/100Mb, 1G, 2.5G, 5G, 10G, 25G, 100G



System Integration

On the right hand side, it shows the computing ability of the PUZZLE series.

IEI implements 5 major CPU brands, including Intel, AMD, Marvell, NXP, Cavium, and 3 kinds of accelerator cards for edge computing or AI computing.

Designing & Manufacture

On the bottom side, it shows ARMOR Link cross IEI cross QNAP. Most of network appliances are about network security. Some of the customers care about where the network appliance is designed and made. Therefore, we provide you two choices, designed and manufactured in Taiwan or in China. QNAP factory is in New Taipei City, Taiwan, and ARMOR Link factory is located in Shanghai, China.

PUZZLE Series

PCIe x8 (by CPU)
PCIe x4 (by PCH)

Standard PCIe Slots

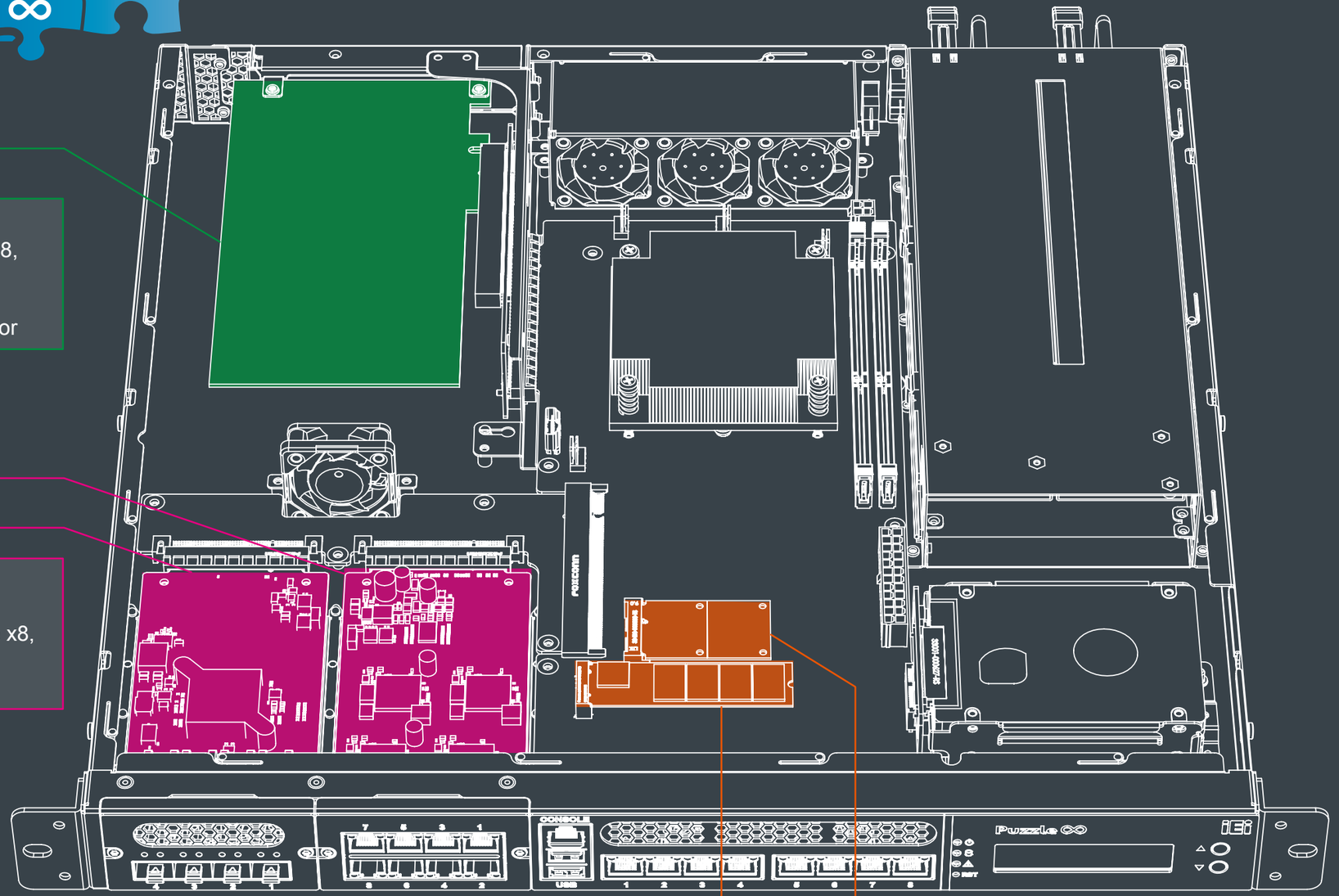
- PUZZLE series support Standard PCIe card slots, PCIe x16, PCIe x8, PCIe x4, PCIe x1.
- Support smart NIC cards and accelerator cards including CPU accelerator, GPU accelerator, FPGA accelerator and VPU accelerator

Two PCIe x4 (by PCH)

8 PCIe Lanes from CPU

IEI PulM Network Module Slot

- IEI PulM Network Module slot support 8 lanes of PCIe Gen3 signal form CPU or PCH. The PCIe lanes could be configured to one PCIe x8, two PCIe x4 or four PCIe x2
- Support smart NIC via PulM Network Module



M.2 Slots & PCIe mini Slots

- M.2 slot support PCIe x1, SATA 6Gb/s and USB 3.0, PCIe mini slots support PCIe x1, USB 2.0
- Support 4G, 5G, Wi-Fi, SSD storage

Various Expansion Slots

Expansion Card provides extra functions and computing power for the network appliance, Edge computing and AI inference computing systems. 4G, 5G, WiFI could be supported by PCIe mini card or M.2 card. Adding a Smart NIC card will increase the performance of system and get specific network functions. Adding accelerator cards like GPU card, FPGA card and VPU card will provide extra performance for a Edge Computing or an AI Inference Computing system.

PUZZLE Series Selection Guide



		PUZZLE-A001	PUZZLE-A002	PUZZLE-IN001/ PUZZLE-IN001A
Platform	Form Factor	1U	1U	1U
	CPU	AMD EPYC™ Embedded 3201 processor, 8C/8T, up to 3.10 GHz AMD EPYC™ Embedded 3151 processor, 4C/8T, up to 2.90 GHz	AMD R-Series RX-421ND processor, 4C, up to 3.4 GHz	Intel® Xeon® E-2136 Processor, 6C/12T, up to 4.50 GHz 8th Generation Intel® Core™ i3-8100T Processor, 4C/4T, up to 3.10 GHz
	Chipset	Integrated in CPU	Integrated in CPU	Intel® C246
Memory	Memory Technology	4 x DDR4 2666 MHz ECC or non-ECC UDIMM Support RDIMM	2 x DDR4 2400MHz Non-ECC UDIMM	2 x DDR4 2400MHz ECC/Non-ECC UDIMM 4 x DDR4 2400MHz ECC/Non-ECC UDIMM (PUZZLE-IN001A)
	Memory Capacity	UDIMM Up to 64GB RDIMM Up to 128GB	Up to 32GB	Up to 32GB Up to 64GB (PUZZLE-IN001A)
	Memory Socket	4 x 288-pin DIMM	2 x 288-pin DIMM	2 x 288-pin DIMM 4 x 288-pin DIMM (PUZZLE-IN001A)
Network and Security	Network Acceleration and Security Function	• Secure Processor for Crypto Co-processing • Secure Memory Encryption (SME) • Secure Encrypted Virtualization (SEV) • Integrated crypto acceleration supporting the IPsec protocol	• AES-NI encryption acceleration • AMD Secure Processor • Secure boot with AMD Hardware Validated Boot (HVB)	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header
Networking	Ethernet IC	1 GbE NIC: Broadcom® BCM5720	1 GbE NIC: Broadcom® BCM5720	1 GbE NIC: Intel® i211-AT 8 x 5GbE NIC : AQC112C (PUZZLE-IN001A)
	Ethernet Port	8 x 1GbE RJ-45 LAN ports 4 x 10GbE SPF+ ports	6 x 1GbE RJ-45 LAN ports	8 x 1GbE RJ-45 LAN ports 8 x 5 GbE RJ-45 LAN ports (PUZZLE-IN001A)
	Network Module Slot	1 x PuIM module slot	N/A	2 x PuIM module slots
Expansion Slot	PCIe Slot	2 x PCIe x4 slots	2 x PCIe x4 slots	1 x PCIe x4 slot, 1 x PCIe x8 slot
	PCIe Mini Card Slot	1 x PCIe Mini card (PCIe, USB 2.0)	1 x PCIe Mini card (PCIe, USB 2.0, Micro SIM slot)	1 x PCIe Mini card (PCIe & SATA, USB 2.0)
	M.2	1 x 3042/2260 M.2 B key (SATA / USB 3.2 Gen1) Support SATA SSD and 4G LTE module	1 x 2230 M.2 A key (PCIe / USB 2.0)	1 x 3042/2260 M.2 B key (SATA / USB 3.2 Gen1) Support SATA SSD and 4G LTE module
Storage	Storage	2 x 2.5" SATA HDD/SSD bay	2 x 2.5" SATA HDD/SSD bay	2 x 2.5" SATA HDD/SSD bay
	eMMC	N/A	8GbE	N/A
	SD Card	N/A	N/A	N/A
External I/O	USB	2 x USB 3.2 Gen 1	2 x USB 3.2 Gen 1	2 x USB 3.2 Gen 1
	Console	1 x RJ-45	1 x RJ-45	1 x RJ-45
Internal I/O	M.2	1 x 3042/2260 M.2 B key (SATA / USB 3.2 Gen1)	1 x 2230 M.2 A key (PCIe / USB 2.0)	1 x 3042/2260 M.2 B key (SATA / USB 3.2 Gen1)
	HDMI	N/A	N/A	1 x HDMI connecter (optional)
	USB	1 x USB USB 3.2 Gen 1 4 x USB 2.0	1 x USB USB 3.2 Gen 1 2 x USB 2.0	4 x USB 2.0 (pin header)
Power and Mechanical	Power Switch	1 x Power Switch	1 x Power Switch	1 x Power Switch
	Reset Button	1 x Reset Button	1 x Reset Button	1 x Reset Button
	Power Input	100 V ~ 240 V	100 V ~ 240 V	100 V ~ 240 V
	Type/Watt	Redundant Power 300W, 90V~264V AC	ATX Power 250W, 90V~264V AC	Redundant Power 300W, 90V~264V AC
	Processor Cooling	1 x Passive CPU Heatsink	1 x Passive CPU Heatsink	1 x Passive CPU Heatsink
	System Cooling	4 x Cooling fans with smart fan	4 x Cooling Fans with Smart Fan	4 x Cooling Fans with Smart Fan
	Antenna Port	1 x Antenna port	1 x Antenna port	1 x Antenna port
Physical and Environmental	Storage Temperature	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	0 ~ 40°C (32 ~ 104°F)	0 ~ 40°C (32 ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	430 x 426 x 44.2	430 x 320 x 44.2	430 x 426 x 44.2
	Weight	7 kg	5 kg	7 kg
OS and Certifications	Certification	CE / FCC	CE / FCC	CE / FCC
	Operating System	Linux Ubuntu 16.04.04	Linux Ubuntu 16.04.04	Linux Ubuntu 16.04.04
Indicators	LCM	LCM, 2 buttons	LCM, 2 buttons	LCM, 2 buttons
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

PUZZLE Series Selection Guide




		PUZZLE-IN002	PUZZLE-IN003B	PUZZLE-IN004	PUZZLE-M801
Platform	Form Factor	1U	Desktop	1U	1U
	CPU	8th Generation Intel® Core™ i3-8100T Processor, 4C/4T, up to 3.10 GHz Intel® Pentium® Gold G5400T Processor, 2C/4T, up to 3.10 GHz	Intel® Atom® processor C3758 16M cache, up to 2.20 GHz Intel® Atom® processor C3558 8M cache, up to 2.20 GHz	Intel® Xeon® D-2145NT processor 11M cache, 1.90 GHz Intel® Xeon® D-2146NT processor 11M cache, 2.30 GHz Intel® Xeon® D-2166NT processor 16.5M cache, 2.00 GHz Intel® Xeon® D-2187NT processor 22M cache, 2.00 GHz	Marvell® ARMADA® 88F8040 High-Performance CPU System on Chip, 4C, 1.6GHz
	Chipset	Intel® H310	Integrated in CPU	Integrated in CPU	Integrated in CPU
Memory	Memory Technology	2 x DDR4 2400MHz Non-ECC UDIMM	DDR4 2133MHz ECC(By CPU) or non-ECC UDIMM, Support DDR4 RDIMM	DDR4 2666MHz ECC (By CPU) or non-ECC RDIMM	DDR4 2400MHz ECC/Non-ECC/ RDIMM
	Memory Capacity	Up to 32GB	UDIMM up to 64GB RDIMM up to 128GB	UDIMM up to 128GB RDIMM up to 258GB LRDIMM up to 512 GB	Up to 16GB
	Memory Socket	2 x 288-pin DIMM	4 x 288-pin DIMM	8 x 288-pin RDIMM	1 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Virtualization Technology for Directed I/O (VT-d) • Intel® QuickAssist Technology (Intel® QAT)	• Intel® AES New Instructions • Intel® QuickAssist Technology (Intel® QAT) • Intel® Virtualization Technology (Intel® VT) • Intel® Trusted Execution Technology (Intel® TXT)	• Configurable packet processor • HW offload for networking • Acceleration engines for storage, networking and security • Public Key Processor (RSA/DH/ECC) • Secure Storage • Secure boot
	TPM	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	1 x TPM 2.0 pin header	N/A
Networking	Ethernet IC	1 GbE NIC: Intel® i211-AT	1 GbE NIC: Intel® i211-AT 1 GbE PHY: Marvell 88E1512 10 GbE: Integrated in CPU	1 GbE NIC: Intel® i211-AT	10 GbE PHY: SoC Marvell 88F8040 1 GbE PHY: Marvell 88E1512P
	Ethernet Port	6 x 1GbE RJ-45 LAN ports	2 x 10 GbE SFP+ 6 x 1GbE RJ-45 LAN ports	4 x 10 GbE, SFP+ 8 x 1GbE RJ-45 LAN ports	2 x 10 GbE SFP+ 4 x 1GbE RJ-45 LAN ports
	Network Module Slot	N/A	N/A	1 x PuIM module slot	N/A
Expansion Slot	PCIe Slot	1 x PCIe x16 slot	N/A	1 x PCIe x4 slot	1 x PCIe x16 slot (PCIe x2 signal)
	PCIe Mini Card Slot	1 x PCIe Mini card (SATA, USB 2.0) with SIM slot	1 x PCIe Mini (USB 2.0, PCIe x1) with SIM card slot	1 x PCIe Mini (PCIe +USB 2.0) with SIM card	N/A
	M.2	1 x M.2 A key (PCIe & USB 2.0)	1 x M.2 A key (USB 2.0, PCIe x1)	2 x 2260/2280 M key (PCIe x4)	1 x M.2 B Key (3042/2260) (SATA and USB 3.2 Gen 1) Support SATA SSD and 4G LTE module
Storage	Storage	2 x 2.5" SATA HDD/SSD bay	1 x SATA DOM + 1 x SATA power 5V 1 x M.2 M key 2260/2280	2 x 2.5" SATA HDD/SSD bay	1 x 2.5" SATA HDD/SSD
	eMMC	N/A	1 x eMMC 32GB	N/A	32GB
	SD Card	N/A	N/A	N/A	N/A
External I/O	USB	2 x USB 3.2 Gen 1	1 x USB 2.0 1 x USB 3.2 Gen 1	1 x USB 2.0 1 x USB 3.2 Gen 1	2 x USB 3.2 Gen 1
	Console	1 x RJ-45	1 x RJ-45	1 x RJ-45	1 x RJ-45
Internal I/O	M.2	1 x M.2 A key (PCIe & USB 2.0)	1 x M.2 A key (USB 2.0, PCIe x1)	2 x 2260/2280 M key (PCIe x4)	1 x M.2 B key (SATA 6Gb/s & USB 3.2 Gen 1)
	HDMI	1 x HDMI connecter (optional)	N/A	N/A	N/A
	USB	2 x USB 2.0 (pin header)	N/A	1 x USB2.0 QNAP USB DOM	1 x USB 2.0
Power and Mechanical	Power Switch	1 x Power Switch	1 x Power Switch	1 x Power Switch	1 x Power Switch
	Reset Button	1 x Reset Button	1 x Reset Button	1 x Reset Button	1 x Reset Button
	Power Input	100 V ~ 240 V	1 x DC jack	100 V ~ 240 V	100 V ~ 240 V
	Type/Watt	ATX Power 250W, 90V~264V AC	12 V DC-in, 60W	Redundant Power 300W, 90V~264V AC	ATX Power 250W, 90V~264V AC
	Processor Cooling	1 x Passive CPU Heatsink	Passive CPU Heatsink	1 x Passive CPU Heatsink	1 x Active CPU Heatsink with fan
	System Cooling	4 x Cooling Fans with Smart Fan	Two system fans for C3758 sku Fanless for C3558 sku	4 x Cooling fans with smart fan	2 x Cooling Fans with Smart Fan
	Antenna Port	1 x Antenna port	2 for WiFi, 2 for WWAN	1 x Antenna port	1 x Antenna port
Physical and Environmental	Storage Temperature	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C	0 ~ 40°C
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	0 ~ 40°C (32 ~ 104°F)	0 ~ 40°C (32 ~ 104°F)	0 ~ 40°C (32 ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing	Relative humidity: 5% ~ 90% non-condensing	Relative humidity: 5% ~ 90% non-condensing	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	430 x 320 x 44.2	225 x 206 x 44.2	430 x 426 x 44.2	430 x 320 x 44.2
	Weight	5 kg	2 kg	7 kg	5 kg
OS and Certifications	Certification	CE / FCC	CE / FCC	CE / FCC	CE / FCC
	Operating System	Linux Ubuntu 16.04.04	Linux 18.04 (CentOS, Red Hat, Ubuntu, etc.)	Linux 18.04 (CentOS, Red Hat, Ubuntu, etc.)	Linux Ubuntu 16.04.04
Indicators	LCM	LCM, 2 buttons	N/A	LCM, 2 buttons	N/A
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	N/A	1 x Power LED, 1 x Storage LED, 1 x Alert LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

PUZZLE-A001

1U Rackmount Network Appliance with AMD EPYC™ Embedded 3000 series processor, one PulM module slot & 2 PCIe x4 slots

Features

- AMD EPYC™ Embedded 3000 series processor, high-performance System-on-Chip
- Support 8 x GbE RJ-45 via BCM 5720, 4 x 10 GbE SFP+
- 4 x 288-pin DDR4 2666 MHz, UDIMM up to 64GB / RDIMM up to 128GB
- 1 x RJ-45 Console, 2 x USB 3.2 Gen 1 (5Gb/s), LCM
- 2 x 2.5" SATA drive bay, 1 x M.2 B-Key (SATA, USB 3.2 Gen 1 (5Gb/s)), 1 x PCIe Mini card (PCIe, USB 2.0)
- Support two PCIe x4 slots, one PulM module slot
- Redundant PSUs

Specifications

		PUZZLE-A001-SO2	PUZZLE-A001-SO3
Platform	Form Factor	1U	
	CPU	AMD EPYC™ Embedded 3201 processor, 8C/8T, up to 3.10 GHz	AMD EPYC™ Embedded 3151 processor, 4C/8T, up to 2.90 GHz
	Chipset	Integrated in CPU	
Memory	Memory Technology	4 x DDR4 2666 MHz ECC or non-ECC UDIMM Support RDIMM	
	Memory Capacity	UDIMM Up to 64GB / RDIMM Up to 128GB	
	Memory Socket	4 x 288-pin DIMM	
Network and Security	Network Acceleration and Security Function	• Secure Processor for Crypto Co-processing • Secure Memory Encryption (SME) • Secure Encrypted Virtualization (SEV) • Integrated crypto acceleration supporting the IPsec protocol	
	TPM	1 x TPM 2.0 pin header	
Networking	Ethernet IC	1 GbE NIC: Broadcom® BCM5720	
	Ethernet Port	8 x 1GbE RJ-45 LAN ports, 4 x 10 GbE SPF+	
	Network Module Slot	1 x PulM module slot	
Expansion Slot	PCIe Slot	2 x PCIe x4 slot	
	PCIe Mini Card Slot	1 x PCIe Mini card (PCIe, USB 2.0)	
	M.2	1 x 2260/3042 B key (SATA and USB 3.2 Gen 1 (5Gb/s)) Support SATA SSD and 4G LTE module	
Storage	Storage	2 x 2.5" SATA HDD/SSD bay	
	eMMC	N/A	
	SD Card	N/A	
External I/O	USB	2 x USB 3.2 Gen 1 (5Gb/s)	
	Console	1 x RJ-45	
Internal I/O	M.2	1 x 2260/3042 B key (SATA and USB 3.2 Gen 1 (5Gb/s))	
	HDMI	N/A	
	USB	1 x USB 3.2 Gen 1 (5Gb/s) 4 x USB 2.0	
Power and Mechanical	Power Switch	1 x Power switch	
	Reset Button	1 x Reset button	
	Power Input	100 V ~ 240 V	
	Type/Watt	Redundant power 300W	
		90V ~ 264V AC	
	Processor Cooling	1 x Passive CPU heatsink	
	System Cooling	4 x Cooling fans with smart fan	
	Antenna Port	1 x Antenna port	
Physical and Environmental	Storage Temperature	0 ~ 40°C	
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	
	Operating Humidity	5% ~ 90% non-condensing	
	Dimensions (W x L x H) (mm)	430 x 426 x 44.2	
	Weight	7kg	
OS and Certifications	Certification	CE / FCC	
	Operating System	Linux Ubuntu 18.04.04	
Indicators	LCM	LCM, 2 buttons	
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	

Ordering Information

Part No.	Description
PUZZLE-A001-SO2/16G/R-R10	1U Rackmount Network Appliance with AMD EPYC™ Embedded 3201 processor, 16GB DDR4, two 256GB SSD, four 10 GbE SFP+, eight 1GbE, one PulM module slot, two PCIe expansion, Redundant Power, RoHS
PUZZLE-A001-SO3/16G/R-R10	1U Rackmount Network Appliance with AMD EPYC™ Embedded 3151 processor, 16GB DDR4, two 256GB SSD, four 10 GbE SFP+, eight 1GbE, one PulM module slot, two PCIe expansion, Redundant Power, RoHS

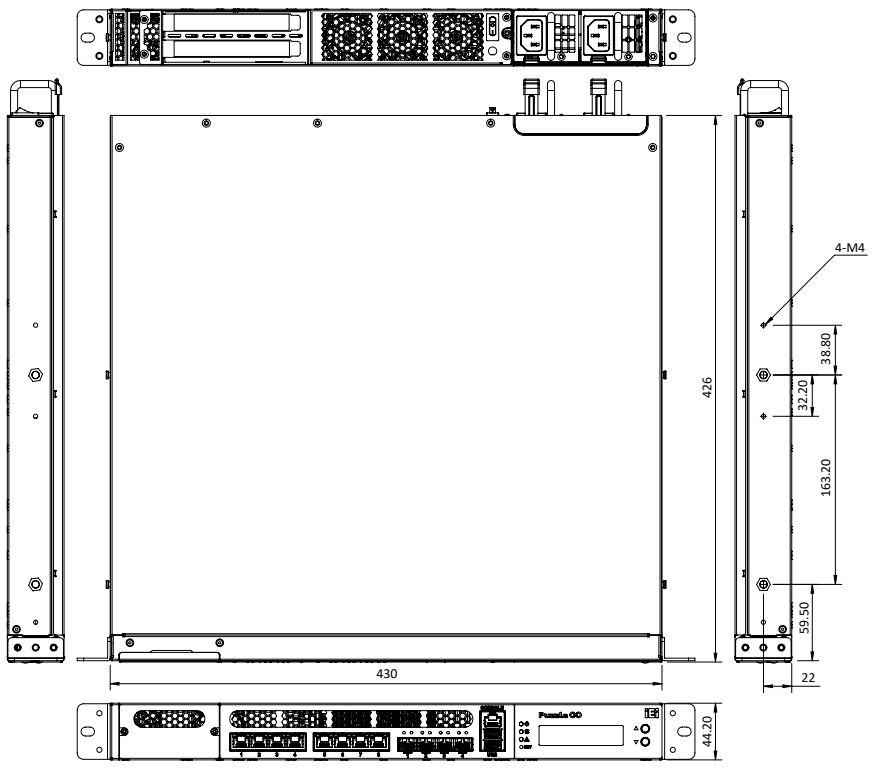
Packing List

	PUZZLE-A001-SO2/16G/R	PUZZLE-A001-SO3/16G/R
Power cord	2	2
Rack mounting ears	2	2
Screws for rack mounting ears	6	6
USB to console cable	1	1
RS-232 to console cable	Option	Option
Slide rail	Option	Option

Options

Item	Part No.	Description
Slide rail	RAIL-B02	New rail kit for new 1U & 2U NAS: TVS-471U, 1253U, etc
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A)D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-A002

1U Rackmount Network Appliance with AMD R-Series RX-421ND Processor, Support Six GbE RJ-45

Features

- AMD R-Series RX-421ND quad-core 2.1 GHz processor
- 2 x DDR4 2400MHz Non-ECC UDIMM, up to 32 GB
- Support six GbE RJ-45 via BROADCOM BCM 5720
- 1 x RJ-45 Console, 2 x USB 3.2 Gen 1 (5Gb/s), 2 x USB 2.0, LCM
- 1 x PCIe x8, 2 x 2.5” SATA drive bay, 1 x PCIe Mini, 1 x SD slot
- Support two PCIe x4

Specifications

		PUZZLE-A002
Platform	Form Factor	1U
	CPU	AMD R-Series RX-421ND processor, 4C, up to 3.4 GHz
	Chipset	Integrated in CPU
Memory	Memory Technology	2 x DDR4 2400MHz ECC/Non-ECC/RDIMM
	Memory Capacity	Up to 32GB
	Memory Socket	2 x 288-pin DIMM
Network and Security	Network acceleration and Security function	• AES-NI encryption acceleration • AMD Secure Processor • Secure boot with AMD Hardware Validated Boot (HVB)
	TPM	1 x TPM 2.0 pin header
Networking	Ethernet IC	1 GbE NIC: Broadcom® BCM5720
	Ethernet Port	6 x 1GbE RJ-45 LAN ports
	Network Module Slot	N/A
Expansion Slot	PCIe Slot	2 x PCIe x4 slot
	PCIe Mini Card Slot	1 x PCIe Mini card (PCIe, USB 2.0, Micro SIM slot)
	M.2	1 x 2230 A key (PCIe & USB 2.0)
Storage	Storage	2 x 2.5" SATA HDD/SSD bay
	eMMC	8GbE
	SD Card	N/A
External I/O	USB	2 x USB 3.2 Gen 1 (5Gb/s)
	Console	1 x RJ-45
Internal I/O	M.2	1 x 2230 A key (PCIe & USB 2.0)
	HDMI	N/A
	USB	1 x USB 3.2 Gen 1 (5Gb/s) 2 x USB 2.0
Power and Mechanical	Power Switch	1 x Power switch
	Reset Button	1 x Reset button
	Power Input	100 V ~ 240 V
	Type/Watt	ATX power 250W 90V~264V AC
	Processor Cooling	1 x Passive CPU heatsink
	System Cooling	4 x Cooling fans with smart fan
	Antenna Port	1 x Antenna port
Physical and Environmental	Storage Temperature	0 ~ 40°C
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	430 x 320 x 44.2
	Weight	5kg
OS and Certifications	Certification	CE / FCC
	Operating System	Linux Ubuntu 16.04.04
Indicators	LCM	LCM, 2 buttons
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

Ordering Information

Part No.	Description
PUZZLE-A002-MF1-R10	1U Rackmount Network Appliance with AMD® RX-421ND processor, two DDR4 slots, and six 1GbE, two PCIe x4 expansion, RoHS
PUZZLE-A002-MF1/8G-R10	1U Rackmount Network Appliance with AMD® RX-421ND processor, 8GB DDR4, one 256GB SSD, six 1GbE, two PCIe x4 expansion, RoHS

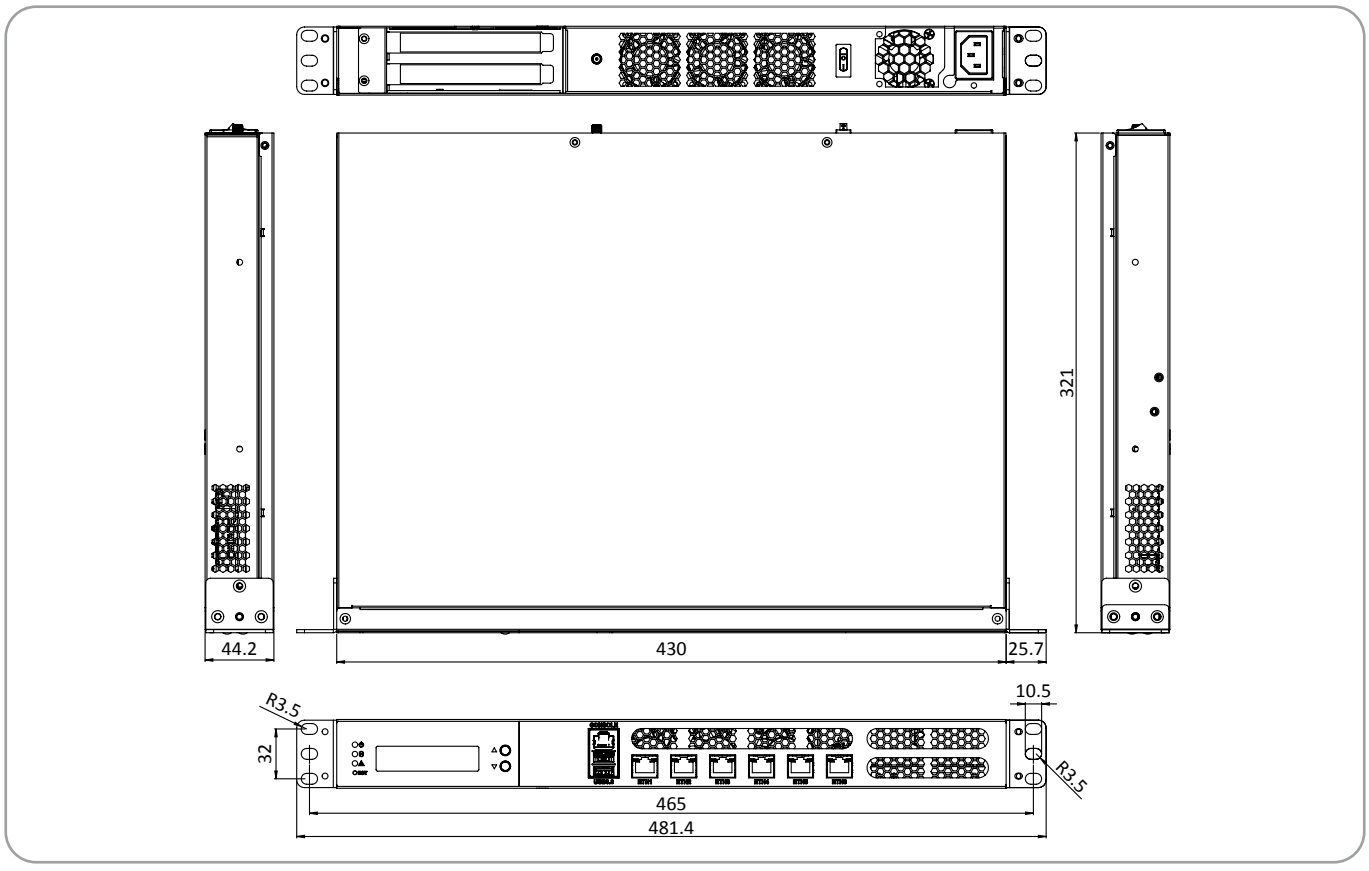
Packing List

	PUZZLE-A002-MF1	PUZZLE-A002-MF1/8G
Power cord	1	1
Rack mounting ears	2	2
Screws for rack mounting ears	6	6
USB to console cable	Option	1
RS-232 to console cable	1	Option
Slide rail	Option	Option

Options

Item	Part No.	Description
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A) D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-IN001

1U Rackmount Network Appliance with Intel® Xeon® E and 8th Generation Intel® Core™ i3/Pentium®/Celeron® Processor, two PulM module slots and two PCIe slots

Features

- Intel® Xeon® E, 8th Generation Intel® Core™/Pentium®/Celeron® processor
- 8 x GbE RJ-45 via Intel® I211
- 2 x 288-pin DIMM, DDR4 2400MHz ECC & non ECC, up to 32GB
- 1 x RJ-45 Console, 2 x USB 3.2 Gen 1 (5Gb/s), LCM
- 2 x 2.5" SATA drive bay, 1 x M.2 B-Key (SATA, USB 3.2 Gen 1 (5Gb/s)), 1 x PCIe Mini
- Support PCIe x4, PCIe x8 slot and two PulM module slots
- Redundant PSUs

Specifications

		PUZZLE-IN001-XE	PUZZLE-IN001-i3T
Platform	Form Factor	1U	
	CPU	Intel® Xeon® E-2136 processor, 6C/12T, up to 4.50 GHz	8th Generation Intel® Core™ i3-8100T processor, 4C/4T, up to 3.10 GHz
	Chipset	Intel® C246	
Memory	Memory Technology	2 x DDR4 2400MHz ECC/Non-ECC/RDIMM	
	Memory Capacity	Up to 32GB	
	Memory Socket	2 x 288-pin DIMM	
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	
	TPM	1 x TPM 2.0 pin header	
Networking	Ethernet IC	1 GbE NIC: Intel® I211-AT	
	Ethernet Port	8 x 1GbE RJ-45 LAN ports	
	Network Module Slot	2 x PulM module slots	
Expansion Slot	PCIe Slot	1 x PCIe x4 slot, 1 x PCIe x8 slot	
	PCIe Mini Card Slot	1 x PCIe Mini card (PCIe & SATA, USB 2.0)	
	M.2	1 x 2260/2280 B Key (SATA and USB 3.2 Gen 1) Support SATA SSD and 4G LTE module	
Storage	Storage	2 x 2.5" SATA HDD/SSD bay	
	eMMC	N/A	
	SD Card	N/A	
External I/O	USB	2 x USB 3.2 Gen 1 (5Gb/s)	
	Console	1 x RJ-45	
Internal I/O	HDMI	1 x HDMI connecter (optional)	
	USB	4 x USB 2.0 (pin header)	
Power and Mechanical	Power Switch	1 x Power switch	
	Reset Button	1 x Reset button	
	Power Input	100 V ~ 240 V	
	Type/Watt	Redundant power 300W	
		90V ~ 264V AC	
	Processor Cooling	1 x Passive CPU heatsink	
	System Cooling	4 x Cooling fans with smart fan	
	Antenna Port	1 x Antenna port	
Physical and Environmental	Storage Temperature	0 ~ 40°C	
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	
	Operating Humidity	5% ~ 90% non-condensing	
	Dimensions (W x L x H) (mm)	430 x 426 x 44.2	
	Weight	7kg	
OS and Certifications	Certification	CE / FCC	
	Operating System	Linux Ubuntu 16.04.04	
Indicators	LCM	LCM, 2 buttons	
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	

Ordering Information

Part No.	Description
PUZZLE-IN001-XE/R-R10	1U Rackmount Network Appliance with Intel® Gen8 Xeon® E-2136 processor, two DDR4 slots, and eight 1GbE, two PulM module slots, two PCIe expansion, Redundant Power, RoHS
PUZZLE-IN001-i3T/R-R10	1U Rackmount Network Appliance with Intel® Gen8 Core™ i3-8100T processor, two DDR4 slots, and eight 1GbE, two PulM module slots, two PCIe expansion, Redundant Power, RoHS
PUZZLE-IN001-XE/16G/ R-R10	1U Rackmount Network Appliance with Intel® Gen8 Xeon® E-2136 processor, 16GB DDR4, two 256GB SSD, and eight 1GbE, two PulM module slots, two PCIe expansion, Redundant Power, RoHS
PUZZLE-IN001-i3T/16G/ R-R10	1U Rackmount Network Appliance with Intel® Gen8 Core™ i3-8100T processor, 16GB DDR4, two 256GB SSD, and eight 1GbE, two PulM module slots, two PCIe expansion, Redundant Power, RoHS

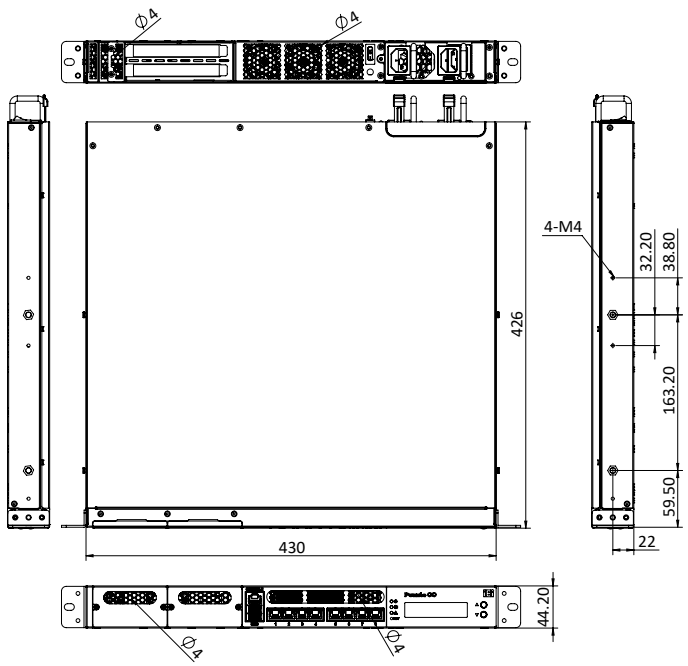
Packing List

	PUZZLE-IN001-XE/R	PUZZLE-IN001-i3T/R	PUZZLE-IN001-XE/16G/R	PUZZLE-IN001-i3T/16G/R
Power cord	2	2	2	2
Rack mounting ears	2	2	2	2
Screws for rack mounting ears	6	6	6	6
USB to console cable	Option	Option	1	1
RS-232 to console cable	1	1	Option	Option
Slide rail	Option	Option	Option	Option

Options

Item	Part No.	Description
Slide rail	RAIL-B02	New rail kit for new 1U & 2U NAS: TVS-471U, 1253U, etc
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A) D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-IN001A

1U Rackmount Network Appliance with Intel® Xeon® E and 8th Generation Intel® Core™ i3/Pentium®/Celeron® Processor, two PulM module slots and two PCIe slots

Features

- Intel® Xeon® E, 8th Generation Intel® Core™/Pentium®/Celeron® processor
- 8 x 5 GbE RJ-45 via AQC 112C
- 4 x 288-pin DIMM, DDR4 2400MHz ECC & non ECC, up to 64 GB
- 1 x RJ-45 Console, 2 x USB 3.2 Gen 1 (5Gb/s), LCM
- 2 x 2.5" SATA drive bay, 1 x M.2 B-Key (SATA, USB 3.2 Gen 1 (5Gb/s)), 1 x PCIe Mini
- Support PCIe x4, PCIe x8 slot and two PulM module slots
- Redundant PSUs

Specifications

		PUZZLE-IN001A-XE	PUZZLE-IN001A-i3T
Platform	Form Factor	1U	
	CPU	Intel® Xeon® E-2136 processor, 6C/12T, up to 4.50 GHz	8th Generation Intel® Core™ i3-8100T processor, 4C/4T, up to 3.10 GHz
	Chipset	Intel® C246	
Memory	Memory Technology	4 x DDR4 2400MHz ECC/Non-ECC UDIMM	
	Memory Capacity	Up to 64GB	
	Memory Socket	4 x 288-pin DIMM	
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	
	TPM	1 x TPM 2.0 pin header	
Networking	Ethernet IC	8 x 5GbE NIC: AQC112C	
	Ethernet Port	8 x 5 GbE RJ-45 LAN ports	
	Network Module Slot	2 x PulM module slots	
Expansion Slot	PCIe Slot	1 x PCIe x4 slot, 1 x PCIe x8 slot	
	PCIe Mini Card Slot	1 x PCIe Mini card (PCIe & SATA, USB 2.0)	
	M.2	1 x 2260/2280 B Key (SATA and USB 3.2 Gen 1) Support SATA SSD and 4G LTE module	
Storage	Storage	2 x 2.5" SATA HDD/SSD bay	
	eMMC	N/A	
	SD Card	N/A	
External I/O	USB	2 x USB 3.2 Gen 1 (5Gb/s)	
	Console	1 x RJ-45	
Internal I/O	HDMI	1 x HDMI connecter (optional)	
	USB	4 x USB 2.0 (pin header)	
Power and Mechanical	Power Switch	1 x Power switch	
	Reset Button	1 x Reset button	
	Power Input	100 V ~ 240 V	
	Type/Watt	Redundant power 300W	
		90V ~ 264V AC	
	Processor Cooling	1 x Passive CPU heatsink	
	System Cooling	4 x Cooling fans with smart fan	
	Antenna Port	1 x Antenna port	
Physical and Environmental	Storage Temperature	0 ~ 40°C	
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	
	Operating Humidity	5% ~ 90% non-condensing	
	Dimensions (W x L x H) (mm)	430 x 426 x 44.2	
	Weight	7kg	
OS and Certifications	Certification	CE / FCC	
	Operating System	Linux Ubuntu 18.04.04	
Indicators	LCM	LCM, 2 buttons	
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	

Ordering Information

Part No.	Description
PUZZLE-IN001A-XE/R-R10	1U Rackmount Network Appliance with Intel® Gen8 Xeon® E-2136 processor, four DDR4 slots, and eight 5GbE, two PulM module slots, two PCIe expansion, Redundant Power, RoHS
PUZZLE-IN001A-i3T/R-R10	1U Rackmount Network Appliance with Intel® Gen8 Core™ i3-8100T processor, four DDR4 slots, and eight 5GbE, two PulM module slots, two PCIe expansion, Redundant Power, RoHS

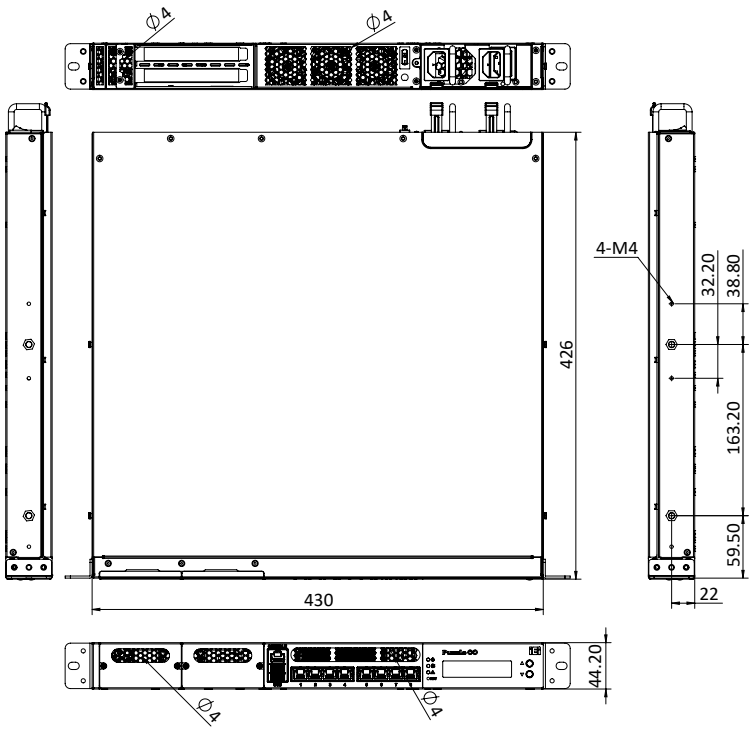
Packing List

	PUZZLE-IN001A-XE/16G/R	PUZZLE-IN001A-i3T/16G/R
Power cord	2	2
Rack mounting ears	2	2
Screws for rack mounting ears	6	6
USB to console cable	1	1
RS-232 to console cable	Option	Option
Slide rail	Option	Option

Options

Item	Part No.	Description
Slide rail	RAIL-B02	New rail kit for new 1U & 2U NAS: TVS-471U, 1253U, etc
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A) D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-IN002

1U Rackmount Network Appliance with 8th Generation Intel® Core™ i7/i5/i3, Pentium® or Celeron® Processor, 1 PCIe slots

Features

- 8th Generation Intel® Core™ i7/i5/i3, Pentium® or Celeron® processor
- 6 x GbE RJ-45 via Intel® I211
- 2 x DDR4 2400MHz Non-ECC UDIMM, up to 32GB
- 1 x RJ-45 Console, 2 x USB 3.2 Gen 1 (5Gb/s), LCM
- 2 x 2.5” SATA drive bay, 1 x M.2 A key (PCIe & USB 2.0), 1 x PCIe Mini card (SATA, USB 2.0) with SIM slot
- Support PCIe x16

Specifications

		PUZZLE-IN002-i3T	PUZZLE-IN002-PGT
Platform	Form Factor	1U	
	CPU	8th Generation Intel® Core™ i3-8100T processor, 4C/4T, up to 3.10 GHz	Intel® Pentium® Gold G5400T processor, 2C/4T, up to 3.10 GHz
	Chipset	Intel® H310	
Memory	Memory Technology	2 x DDR4 2400MHz Non-ECC UDIMM	
	Memory Capacity	Up to 32GB	
	Memory Socket	2 x 288-pin DIMM	
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology	
	TPM	1 x TPM 2.0 pin header	
Networking	Ethernet IC	1 GbE NIC: Intel® I211-AT	
	Ethernet Port	6 x 1GbE RJ-45 LAN ports	
	Network Module Slot	N/A	
Expansion Slot	PCIe Slot	1 x PCIe x16 slot	
	PCIe Mini Card Slot	1 x PCIe Mini card (SATA, USB 2.0) with SIM slot	
	M.2	1 x M.2 A key (PCIe & USB 2.0)	
Storage	Storage	2 x 2.5" SATA HDD/SSD bay	
	eMMC	N/A	
	SD Card	N/A	
External I/O	USB	2 x USB 3.2 Gen 1 (5Gb/s)	
	Console	1 x RJ-45	
Internal I/O	M.2	1 x M.2 A key (PCIe & USB 2.0)	
	HDMI	1 x HDMI connecter (optional)	
	USB	2 x USB 2.0 (pin header)	
Power and Mechanical	Power Switch	1 x Power switch	
	Reset Button	1 x Reset button	
	Power Input	100 V ~ 240 V	
	Type/Watt	ATX power 250W	
		90V~264V AC	
	Processor Cooling	1 x Passive CPU heatsink	
	System Cooling	4 x Cooling fans with smart fan	
	Antenna Port	1 x Antenna port	
Physical and Environmental	Storage Temperature	0 ~ 40°C	
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	
	Operating Humidity	5% ~ 90% non-condensing	
	Dimensions (W x L x H) (mm)	430 x 320 x 44.2	
	Weight	5kg	
OS and Certifications	Certification	CE / FCC	
	Operating System	Linux Ubuntu 16.04.04	
Indicators	LCM	LCM, 2 buttons	
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED	

Ordering Information

Part No.	Description
PUZZLE-IN002-i3T-R10	1U Rackmount Network Appliance with Intel® Gen8 Core™ i3-8100T processor, two DDR4 slots, and six 1GbE, one PCIe x16 expansion, RoHS
PUZZLE-IN002-PGT-R10	1U Rackmount Network Appliance with Intel® Gen8 Pentium® Gold G5400T processor, two DDR4 slots, and six 1GbE, one PCIe x16 expansion, RoHS
PUZZLE-IN002-i3T/8G-R10	1U Rackmount Network Appliance with Intel® Gen8 Core™ i3-8100T processor, 8GB DDR4, one 256GB SSD, six 1GbE, one PCIe x16 expansion, RoHS
PUZZLE-IN002-PGT/8G-R10	1U Rackmount Network Appliance with Intel® Gen8 Pentium® Gold G5400T processor, 8GB DDR4, one 256GB SSD, and six 1GbE, one PCIe x16 expansion, RoHS

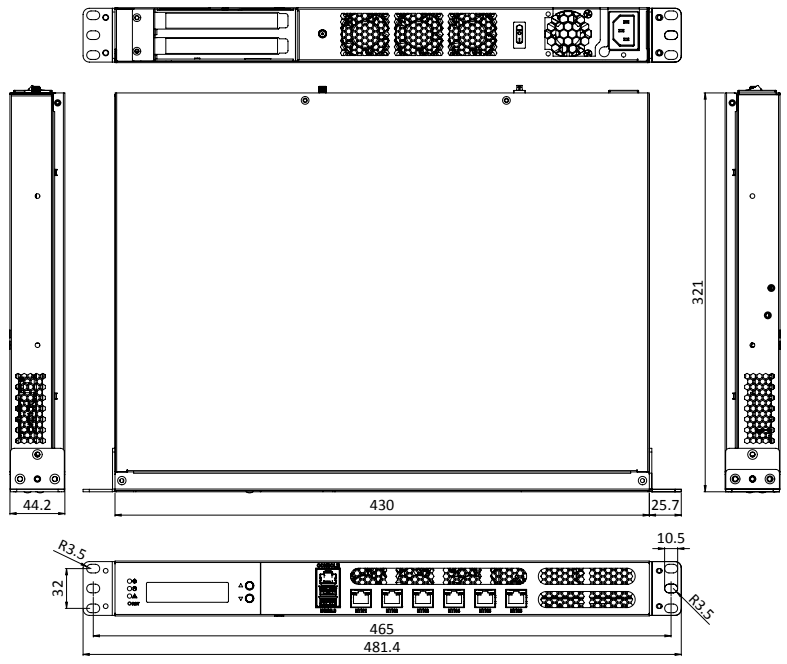
Packing List

	PUZZLE-IN002-i3T	PUZZLE-IN002-PGT	PUZZLE-IN002-i3T/8G	PUZZLE-IN002-PGT/8G
Power cord	1	1	1	1
Rack mounting ears	2	2	2	2
Screws for rack mounting ears	6	6	6	6
USB to console cable	Option	Option	1	1
RS-232 to console cable	1	1	Option	Option
Slide rail	Option	Option	Option	Option

Options

Item	Part No.	Description
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A) D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-IN003B

Desktop Network Appliance with Intel® Atom® Processor C3000 Processor support up to 6 x 1 GbE, 2 x 10 GbE & 2 x M.2 slots, 1 x PCIe Mini, 1 x eMMC 32GB

Features

- Intel® Atom® processor C3558 8M Cache, up to 2.20 GHz
- Support 4 x 1 GbE NIC via Intel® C3558, 2 x 1 GbE PHY via Marvell 88E1512, 2 x 10 GbE SFP+ via intel C3558
- DDR4 2133MHz ECC (by CPU) or non-ECC UDIMM/R-DIMM Up to 32GB
- 1 x M.2 A key (USB 2.0, PCIe x1), 1 x miniPCIe (USB 2.0, PCIe x1) with SIM card slot, 1 x eMMC 32GB

Specifications

		PUZZLE-IN003B-C0	PUZZLE-IN003B-C1
Platform	Form Factor	Desktop	
	CPU	Intel® Atom® processor C3758 16M cache, up to 2.20 GHz	Intel® Atom® processor C3558 8M cache, up to 2.20 GHz
	Chipset	Integrated in CPU	
Memory	Memory Technology	DDR4 2133MHz ECC (By CPU) or non-ECC UDIMM, Support DDR4 RDIMM	
	Memory Capacity	UDIMM up to 64GB / RDIMM up to 128GB	
	Memory Socket	4 x 288-pin DIMM	
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Virtualization Technology for Directed I/O (VT-d) • Intel® QuickAssist Technology (Intel® QAT)	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Virtualization Technology for Directed I/O (VT-d) • Intel® QuickAssist Technology (Intel® QAT)
	TPM	1 x TPM 2.0 pin header	
Networking	Ethernet IC	1 GbE NIC: Intel® I211-AT 1 GbE PHY: Marvell 88E1512 10 GbE: Integrated in CPU	
	Ethernet Port	2 x 10 GbE SFP+ 6 x 1GbE RJ-45 LAN ports	
	Network Module Slot	N/A	
Expansion Slot	PCIe Slot	N/A	
	PCIe Mini Card Slot	1 x PCIe Mini (USB 2.0, PCIe x1) with SIM card slot	
	M.2	1 x 2230 A key (USB 2.0, PCIe x1)	
Storage	Storage	1 x SATA DOM + 1 x SATA power 5V 1 x M.2 M key 2260/2280	
	eMMC	1 x eMMC 32GB	
	SD Card	N/A	
External I/O	USB	1 x USB 2.0 1 x USB 3.2 Gen 1	
	Console	1 x RJ-45	
Internal I/O	M.2	1 x 2230 A key (USB 2.0, PCIe x1)	
	HDMI	N/A	
	USB	N/A	
Power and Mechanical	Power Switch	1 x Power switch	
	Reset Button	1 x Reset button	
	Power Input	1 x DC jack	
	Type/Watt	12 V DC-in, 60W	
	Processor Cooling	Passive CPU heatsink	
	System Cooling	Two system fans	Fanless
	Antenna Port	2 for Wi-Fi/2 for WWAN	
Physical and Environmental	Storage Temperature	0 ~ 40°C	
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)	
	Operating Humidity	Relative humidity: 5% ~ 90% non-condensing	
	Dimensions (W x L x H) (mm)	225 x 206 x 44.2	
	Weight	2 kg	
OS and Certifications	Certification	CE / FCC	
	Operating System	Linux Ubuntu 18.04	
Indicators	LCM	N/A	
	LED	3 (power, storage, alert)	

Ordering Information

Part No.	Description
PUZZLE-IN003B-C0/8G-R10	Desktop network appliance with Intel® ATOM® C3758 processor, 6 x 1GbE, 2 x 10 GbE & 2 x M.2 slots, 1 x PCIe Mini, 1 x eMMC 32GB
PUZZLE-IN003B-C1/8G-R10	Desktop network appliance with Intel® ATOM® C3558 processor, 6 x 1GbE, 2 x 10 GbE & 2 x M.2 slots, 1 x PCIe Mini, 1 x eMMC 32GB

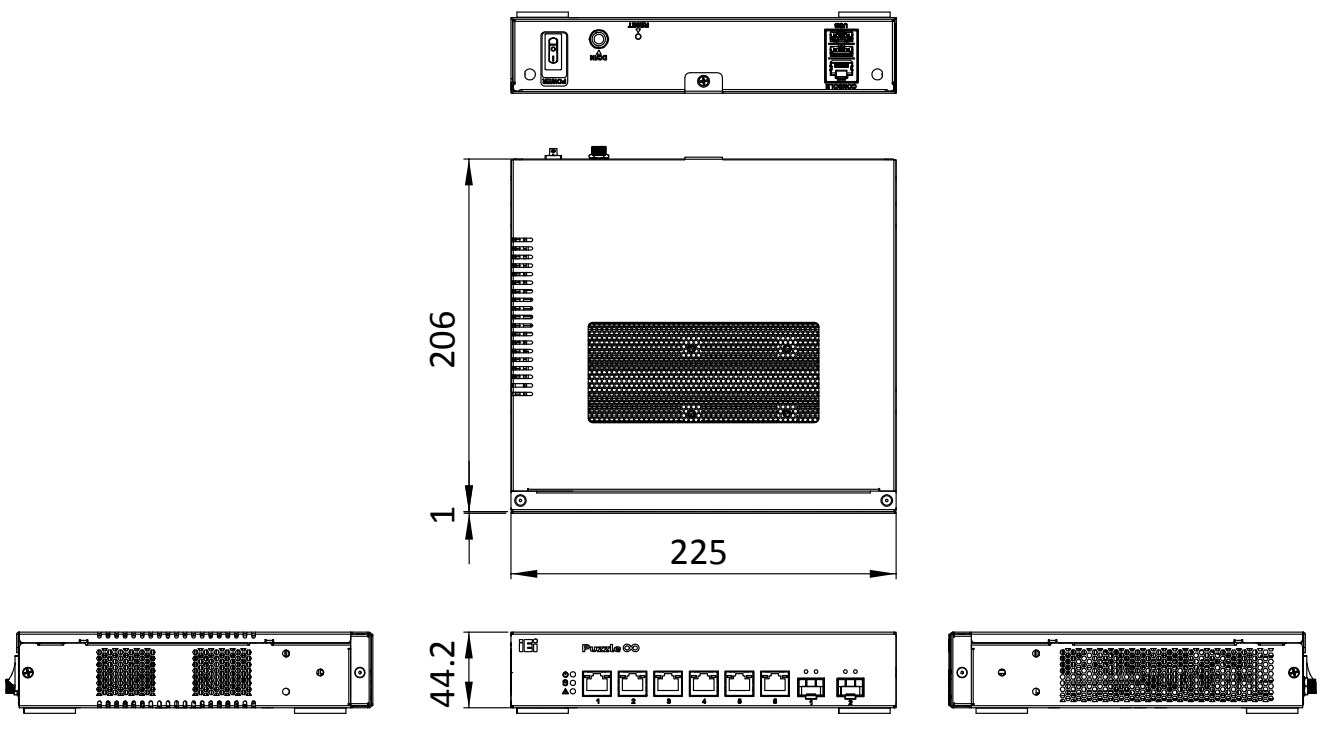
Packing List

	PUZZLE-IN003B-C0/8G-R10	PUZZLE-IN003B-C1/8G-R10
Power cord	1	1
Power adapter	1	1
Rack mounting ears	2	2
Screws for rack mounting ears	6	6
USB to console cable	1	1
RS-232 to console cable	Option	Option

Options

Item	Part No.	Description
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A)D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-IN004

1U Rackmount Network Appliance with Intel® Xeon® D Processor support 8 x GbE, 4 x 10GbE SFP+ and 1 PCIe x8 slot

Features

- Intel® Xeon D-2100 series processor (Skylake-D) with optional Intel® QAT
- Support eight GbE RJ-45 via Intel® I211-AT, four 10 GbE SFP+ and IEI networking module
- 8 x 288-pin RDIMM, 2 x DDR4 2666MHz, UDIMM up to 128GB / RDIMM up to 256GB / LRDIMM up to 512GB
- 1 x RJ-45 Console, 1 x USB 3.2 Gen 1 (5Gb/s), 1 x USB 2.0, LCM
- 2 x 2.5" SATA drive bay, 2 x M.2 M key 2280 (PCIe x4),1 x PCIe Mini (PCIe + USB 2.0) with SIM card
- Support one PCIe x8 slot, one PuIM module slot
- Redundant PSUs

Specifications

		PUZZLE-IN004-XD1	PUZZLE-IN004-XD2	PUZZLE-IN004-XD3	PUZZLE-IN004-XD4
Platform	Form Factor	1U			
	CPU	Intel® Xeon® D-2145NT processor 8-core, 11M cache, 1.90 GHz	Intel® Xeon® D-2146NT processor 8-core, 11M cache, 2.30 GHz	Intel® Xeon® D-2166NT processor 12-core, 16.5M cache, 2.00 GHz	Intel® Xeon® D-2187NT processor 16-core, 22M cache, 2.00 GHz
	Chipset	Integrated in CPU			
Memory	Memory Technology	DDR4 2666MHz ECC (by CPU) or non-ECC			
	Memory Capacity	UDIMM up to 128GB / RDIMM up to 256GB / LRDIMM up to 512GB			
	Memory Socket	8 x 288-pin DIMM			
Network and Security	Network Acceleration and Security Function	• Intel® AES New Instructions • Intel® Software Guard Extensions (Intel® SGX) • Intel® Memory Protection Extensions (Intel® MPX) • Intel® Trusted Execution Technology			
	TPM	1 x TPM 2.0 pin header			
Networking	Ethernet IC	1 GbE NIC: Intel® I211-AT			
	Ethernet Port	4 x 10 GbE SFP+ / 8 x 1GbE RJ-45 LAN ports			
	Network Module Slot	1 x PuIM module slot			
Expansion Slot	PCIe Slot	1 x FH/HL gen3 x8 slot			
	PCIe Mini Card Slot	1 x PCIe Mini (PCIe + USB 2.0) with SIM card			
	M.2	1 x M.2 A key (USB 2.0, PCIe x1)			
Storage	Storage	2 x 2.5" SATA HDD/SSD bay			
	eMMC	N/A			
	SD Card	N/A			
External I/O	USB	1 x USB 2.0 / 1 x USB 3.2 Gen 1			
	Console	1 x RJ-45			
Internal I/O	M.2	2 x M key 2260/2280 (PCIe x4)			
	HDMI	N/A			
	USB	USB DOM, Digital I/O 4in 4out			
Power and Mechanical	Power Switch	1 x Power switch			
	Reset Button	1 x Reset button			
	Power Input	100 V ~ 240 V			
	Type/Watt	Redundant power 300W, 90V~264V AC			
	Processor Cooling	1 x Passive CPU heatsink			
	System Cooling	3 x Cooling fans with smart fan			
	Antenna Port	1 x Antenna port			
Physical and Environmental	Storage Temperature	0 ~ 40°C			
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)			
	Operating Humidity	Relative humidity: 5% ~ 90% non-condensing			
	Dimensions (W x L x H) (mm)	430 x 426 x 44.2			
	Weight	7 kg			
OS and Certifications	Certification	CE/FCC			
	Operating System	Linux Ubuntu 18.04.04			
Indicators	LCM	LCM, 2 buttons			
	LED	Power status, Storage status, Alert LED			

Ordering Information

Part No.	Description
PUZZLE-IN004-XD1/32G/R-R10	1U Rackmount network appliance with Intel® Xeon® D-2145NT processor, 32GB DDR4, two 256GB SSD, eight 1GbE, four 10 GbE, one PuIM module slot and one PCIe expansion, RoHS
PUZZLE-IN004-XD2/32G/R-R10	1U Rackmount network appliance with Intel® Xeon® D-2146NT processor, 32GB DDR4, two 256GB SSD, eight 1GbE, four 10 GbE, one PuIM module slot and one PCIe expansion, RoHS
PUZZLE-IN004-XD3/32G/R-R10	1U Rackmount network appliance with Intel® Xeon® D-2166NT processor, 32GB DDR4, two 256GB SSD, eight 1GbE, four 10 GbE, one PuIM module slot and one PCIe expansion, RoHS
PUZZLE-IN004-XD4/32G/R-R10	1U Rackmount Network Appliance with Intel® Xeon® D-2187NT processor, 32GB DDR4, two 256GB SSD, eight 1GbE, four 10 GbE, one PuIM module slot and one PCIe expansion, RoHS

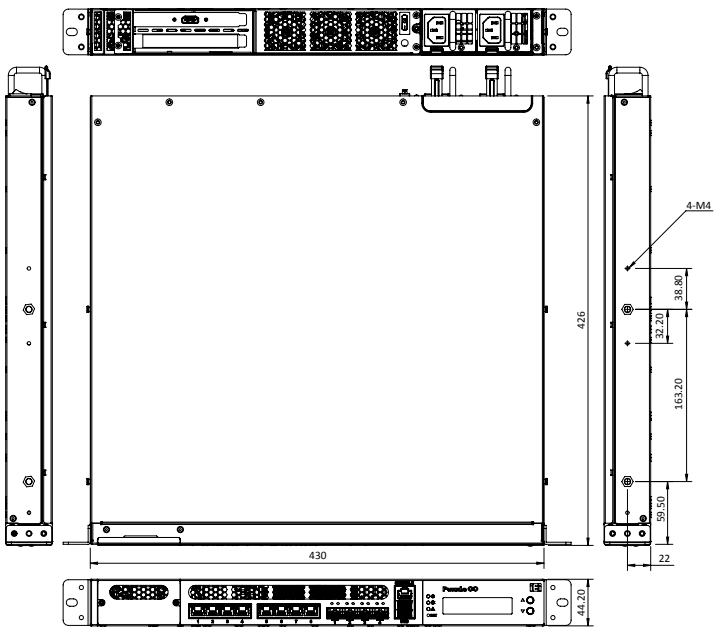
Packing List

	PUZZLE-IN004-XD1/32G/R-R10	PUZZLE-IN004-XD2/32G/R-R10	PUZZLE-IN004-XD3/32G/R-R10	PUZZLE-IN004-XD4/32G/R-R10
Power cord	2	2	2	2
Rack mounting ears	2	2	2	2
Screws for rack mounting ears	6	6	6	6
USB to console cable	1	1	1	1
RS-232 to console cable	option	option	option	option
Slide rail	option	option	option	option

Options

Item	Part No.	Description
Slide rail	RAIL-B02	New rail kit for new 1U & 2U NAS: TVS-471U, 1253U, etc
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A) D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PUZZLE-M801

1U Rackmount Network Appliance with Marvell® ARMADA® 88F8040 High-Performance Quad-Core CPU

Features

- Marvell® ARMADA® 88F8040 high-performance quad-core System-on-Chip processor
- 2 x 10GbE SFP+ via Marvell® ARMADA® 88F8040
- 4 x GbE RJ-45 via Marvell 88E1512P
- 1 x 288-pin DIMM, DDR4 2400MHz, 16GB (ECC)
- 2 x USB 3.2 Gen 1 (5Gb/s), 1 x RJ-45 console, 1 x M.2 B key (SATA & USB 3.2 Gen 1 (5Gb/s)) with SIM holder, 1 x PCIe x16 slot (PCIe x2 signal)

Specifications

		PUZZLE-M801
Platform	Form Factor	1U
	CPU	Marvell® ARMADA® 88F8040 high-performance quad-core System-on-Chip processor, 1.6GHz
	Chipset	Integrated in CPU
Memory	Memory Technology	DDR4 2400MHz ECC/Non-ECC/RDIMM
	Memory Capacity	Up to 16GB
	Memory Socket	1 x 288-pin DIMM
Network and Security	Network Acceleration and Security Function	• Configurable packet processor • HW offload for networking • Acceleration engines for storage, networking and security • Public Key Processor (RSA/DH/ECC) • Secure Storage • Secure boot
	TPM	N/A
Networking	Ethernet IC	1 GbE PHY: Marvell 88E1512P
	Ethernet Port	2 x 10 GbE SFP+, 4 x 1GbE RJ-45 LAN ports
	Network Module Slot	N/A
Expansion Slot	PCIe Slot	1 x PCIe x16 slot (PCIe x2 signal)
	PCIe Mini Card Slot	N/A
	M.2	1 x M.2 B key (SATA & USB 3.2 Gen 1 (5Gb/s))
Storage	Storage	2 x 2.5" SATA HDD/SSD bay
	eMMC	32GB
	SD Card	N/A
External I/O	USB	2 x USB 3.2 Gen 1 (5Gb/s)
	Console	1 x RJ-45
Internal I/O	M.2	1 x M.2 B Key (3042/2260) (SATA and USB 3.2 Gen 1) Support SATA SSD and 4G LTE module.
	HDMI	N/A
	USB	2 x USB 2.0
Power and Mechanical	Power Switch	1 x Power switch
	Reset Button	1 x Reset button
	Power Input	100 V ~ 240 V
	Type/Watt	ATX Power 250W 90V~264V AC
	Processor Cooling	1 x Active CPU heatsink with fan
	System Cooling	2 x Cooling fans with smart fan
	Antenna Port	1 x Antenna port
Physical and Environmental	Storage Temperature	0 ~ 40°C
	Operating Temperature	0 ~ 40°C (32 ~ 104°F)
	Operating Humidity	5% ~ 90% non-condensing
	Dimensions (W x L x H) (mm)	430 x 320 x 44.2
	Weight	5kg
OS and Certifications	Certification	CE / FCC
	Operating System	Linux Ubuntu 16.04.04
Indicators	LCM	LCM, 2 buttons
	LED	1 x Power LED, 1 x Storage LED, 1 x Alert LED

Ordering Information

Part No.	Description
PUZZLE-M801-A1-R10	1U Rackmount Network Appliance with Marvell Armada 8040 processor, one DDR4 slot, four 1GbE, two 10GbE via SFP+, one PCIe expansion, RoHS
PUZZLE-M801-A1/8G-R10	1U Rackmount Network Appliance with Marvell Armada 8040 processor, 8GB DDR4, one 256GB SSD, four 1GbE, two 10GbE via SFP+, one PCIe expansion, RoHS

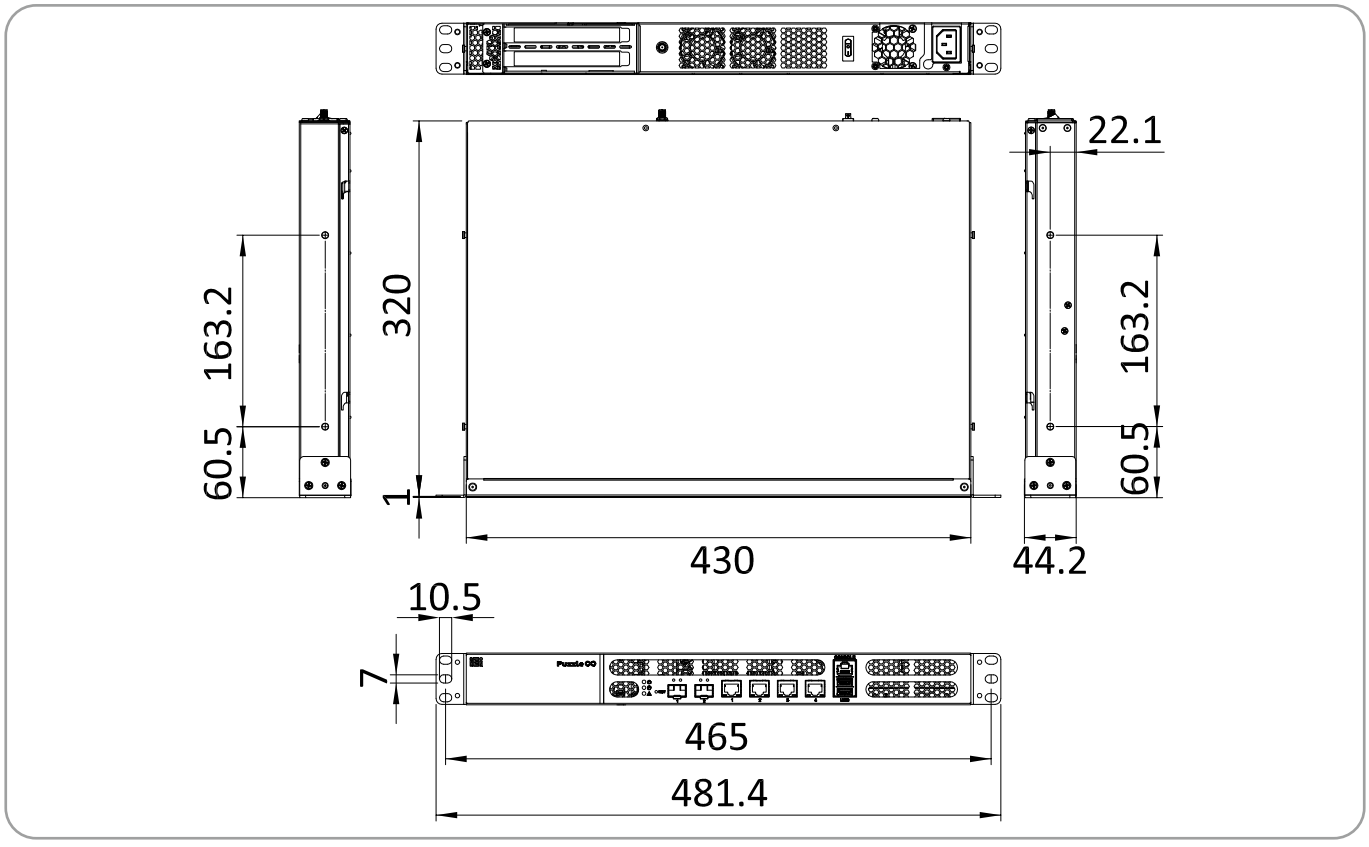
Packing List

	PUZZLE-M801-A1	PUZZLE-M801-A1/8G
Power cord	1	1
Rack mounting ears	2	2
Screws for rack mounting ears	6	6
USB to console cable	Option	1
RS-232 to console cable	1	Option
Slide rail	Option	Option

Options

Item	Part No.	Description
USB to console cable	32013-004000-100-RS	ROUND CABLE; LAN CABLE; FTDI Console Cable; 2; 1800MM; (A)USB A TYPE 4P MALE+PCB:FTDI_FT232RL; (B)RJ-45 8P8C; RoHS
RS-232 to console cable	32005-005100-100-RS	ROUND CABLE; RS-232/422/485; PUZZLE RS-232 Cable; 2; 500MM; 24AWG; (A)D-SUB 9P MALE+#4-40 Screw; (B)RJ-45 PLUG 8P8C; ONE PCS PKG; TC&C; RoHS

Dimensions (Unit: mm)



PuIM Series Selection Guide




	PuIM-1G4T-I211	PuIM-1G4T-I211-BP	PuIM-10G4SF-XL710	PuIM-10G4SF-XL710-BP
Chipset	Intel® I211	Intel® I211	Intel® XL710	Intel® XL710
Bypass	No	Yes	No	Yes
Host Interface	4 PCIe 2.0 x2	4 PCIe 2.0 x2	PCIe 3.0 x8	PCIe 3.0 x8
LAN Interface	RJ-45	RJ-45	SFP+	Fiber LC (SR&LR)
Speed	GbE	GbE	10 GbE	10 GbE
LAN Port Number	4	4	4	4
Operating Temp	0ºC ~ 40ºC			
Humidity	5% ~ 90% RH, non-condensing			
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)			




	PuIM-10G4T-AQC107	PuIM-1G8T-BCM5720	PuIM-25G2SF-MLX	PuIM-10G4SF-MLX
Chipset	Aquantia AQC107	Broadcom BCM5720	Mellanox ConnectX-4	Mellanox ConnectX-4
Bypass	No	No	No	No
Host Interface	4 PCIe 3.0 x2	4 PCIe 2.0 x2	PCIe 3.0 x8	2 PCIe 3.0 x4
LAN Interface	RJ-45	RJ-45	SFP28	SFP+
Speed	10 GbE	GbE	25 GbE	10 GbE
LAN Port Number	4	8	2	4
Operating Temp	0ºC ~ 40ºC			
Humidity	5% ~ 90% RH, non-condensing			
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)			


Coming Soon


	PuIM-2P1M	PuIM-M2-2S
Interface	2 PCIe 3.0 x4	2 PCIe 3.0 x4
Switch IC	ASM1812 (PCIe Gen2x4) FL1100EX (PCI-E To USB 3.0 (4 Port))	N/A
M.2	1 x 2230/2242 M.2 B key (PCIe, USB 3.0)	2 x M key 2260/2280/22110 (PCIe/NVMe)
PCIe	1 x PCIe Mini (PCIe, USB 2.0) 1 x PCIe Mini (PCIe, USB 2.0) with SIM card slot	N/A
Operating Temp	0ºC ~ 40ºC	
Humidity	5% ~ 90% RH, non-condensing	
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	

PuIM-1G4T-I211

Intel® I211 Ethernet Controller based Network Interface Card with Four 1GbE RJ-45 by 4 PCIe 2.0 x2 Interface

PuIM-1G4T-I211

PuIM-1G4T-I211-BP

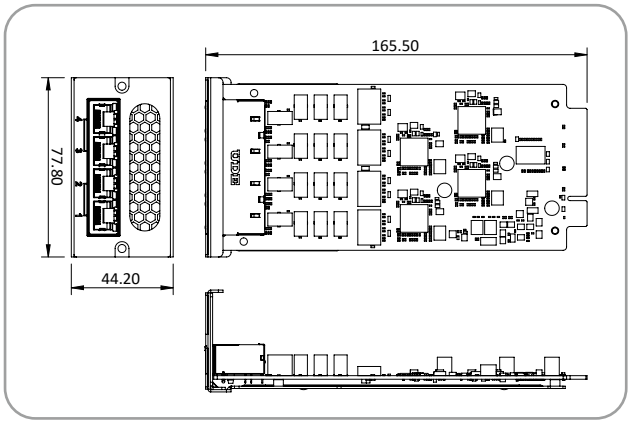
Features

- 1 x Intel® I211-AT Ethernet Controller
- 4 x RJ-45 connector
- 4 PCIe 2.0 x2
- LAN bypass (PuIM-1G4T-I211-BP)
- RoHS compliant

Specifications

Model Name	PuIM-1G4T-I211	PuIM-1G4T-I211-BP
Form Factor	IEI Networking Module - PuIM	
NIC	Intel® I211-AT Ethernet Controller	
LAN Bypass	No	Yes, two pairs
LAN Interface	1 GbE RJ-45	
Ports	4	
Host Interface	4 PCIe 2.0 x2	
Operating Temp	0 ~ 40°C	
Humidity	5% ~ 90% RH, Non-condensing	
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)	
Compliance	RoHS	

Dimensions (Unit: mm)



Packing List

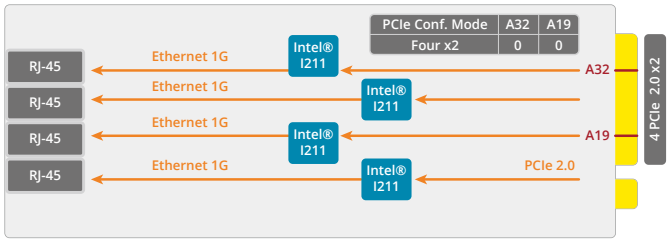
1 x PuIM-1G4T-I211 or PuIM-1G4T-I211-BP module	1 x L-shaped T10 PuIM wrench
2 x Trox screws	1 x QIG

Ordering Information

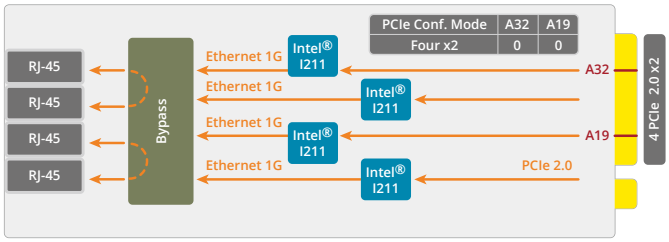
Part No.	Description
PuIM-1G4T-I211-R10	Intel® I211 Ethernet controller based network interface card with four 1GbE RJ-45 without bypass, four PCIe 2.0 x2 interfaces
PuIM-1G4T-I211-BP-R10	Intel® I211 Ethernet controller based network interface card with four 1GbE RJ-45 with bypass function, four PCIe 2.0 x2 interfaces

Block Diagram

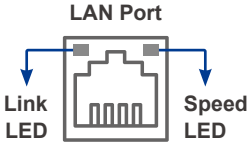
PuIM-1G4T-I211 Block Diagram



PuIM-1G4T-I211-BP Block Diagram



LAN Port



LED	State	Description
Link (Left)	Yellow	Active
Speed (Right)	Orange	1 Gbps data rate
	Green	100 Mbps data rate
Off (Left/Right)	Off	Bypass function (PuIM-1G4T-I211-BP)

PulM-10G4SF-XL710

Intel® XL710-BM1 Ethernet Controller based Network Interface Card with Four SFP+ by PCIe 3.0 x8 Interface

Features

- 1 x Intel® XL710-BM1 Ethernet Controller
- Four 10 GbE SFP+ connectors
- PCIe 3.0 x8
- RoHS/CE/FCC compliant

Specifications

Model Name	PulM-10G4SF-XL710
Form Factor	IEI Networking Module - PulM
NIC	Intel® XL710-BM1 Ethernet Controller
LAN Bypass	N/A
LAN Interface	10 GbE SFP+
Ports	4
Host Interface	PCIe 3.0 x8
Operating Temp	0 ~ 40ºC
Humidity	5% ~ 90% RH, Non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)
Compliance	RoHS/CE/FCC

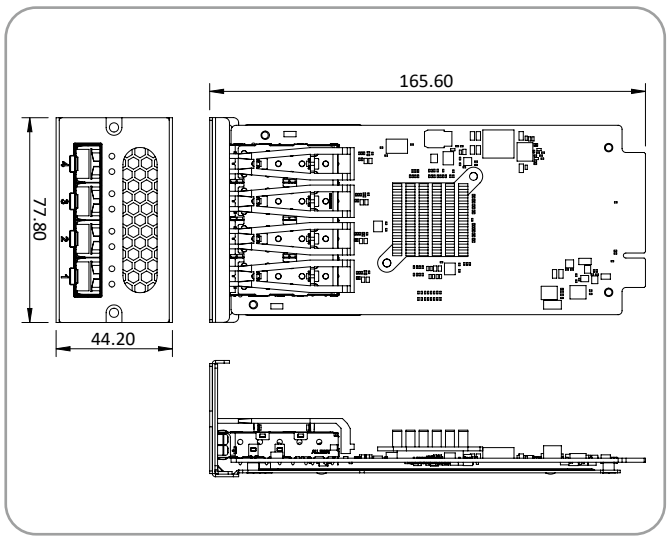
Packing List

1 x PulM-10G4SF-XL710 module	1 x L-shaped T10 PulM wrench
2 x Torx screws	1 x QIG

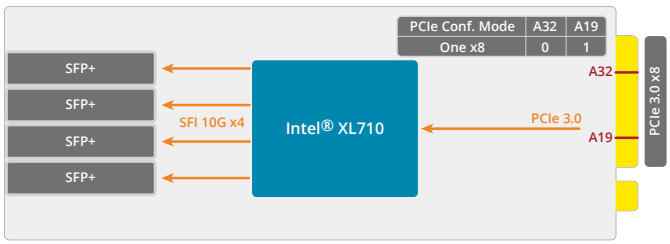
Ordering Information

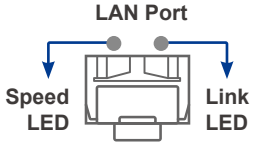
Part No.	Description
PulM-10G4SF-XL710-R10	Intel® XL710-BM1 Ethernet controller based network interface card with four SFP+ by one PCIe 3.0 x8 interface

Dimensions (Unit: mm)



Block Diagram





LED	State	Description
Link (Right)	Yellow	Active
Speed (Left)	Green	10 Gbps data rate

PulM-10G4SF-XL710-BP

Intel® XL710-BM1 Ethernet Controller based Network Interface Card with Four 10GbE Fiber Ports, 2-pair Bypass

Features

- 1 x Intel® XL710-BM1 Ethernet Controller
- Four fiber LC (SR & LR) interface
- PCIe 3.0 x8
- LAN bypass model available
- RoHS compliant

Specifications

Model Name	PulM-10G4SF-XL710-BP
Form Factor	IEI Networking Module - PulM
NIC	Intel® XL710-BM1 Ethernet Controller
LAN Bypass	Yes
LAN Interface	10 GbE fiber LC (SR & LR)
Ports	4
Host Interface	PCIe 3.0 x8
Operating Temp	0 ~ 40ºC
Humidity	5% ~ 90% RH, Non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)
Compliance	RoHS

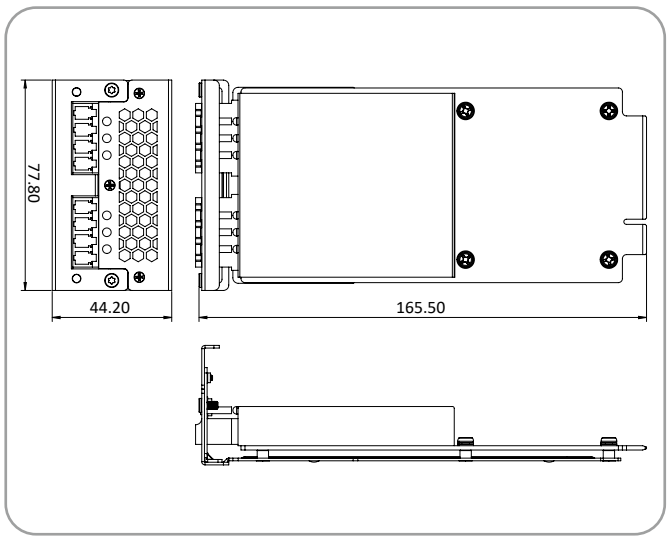
Packing List

1 x PulM-10G4SF-XL710-BP module	1 x L-shaped T10 PulM wrench
2 x Torx screws	1 x QIG

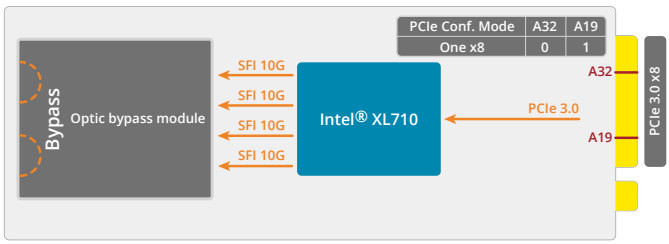
Ordering Information

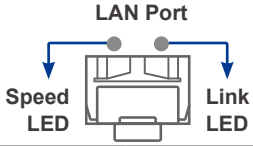
Part No.	Description
PulM-10G4SF-XL710-BP-R10	Intel® XL710-BM1 Ethernet controller based network interface card with four 10GbE fiber ports, two-pair bypass

Dimensions (Unit: mm)



Block Diagram





LED	State	Description
Link (Right)	Yellow	Active
Speed (Left)	Green	25 Gbps data rate
Off (Left/Right)	Off	Bypass function

PulM-10G4T-AQC107

Aquantia AQC107 based Network Interface Card with Four 10GBASE-T by 4 PCIe 3.0 x2 Interface

Features

- 4 x Aquantia AQC107
- 4 x 10G BASE-T connector
- 4 PCIe 3.0 x2
- RoHS compliant

Specifications

Model Name	PulM-10G4T-AQC107
Form Factor	IEI Networking Module - PulM
NIC	Aquantia AQC107
LAN Bypass	N/A
LAN Interface	10G BASE-T
Ports	4
Host Interface	4 PCIe 3.0 x2
Operating Temp	0 ~ 40ºC
Humidity	5% ~ 90% RH, Non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)
Compliance	RoHS

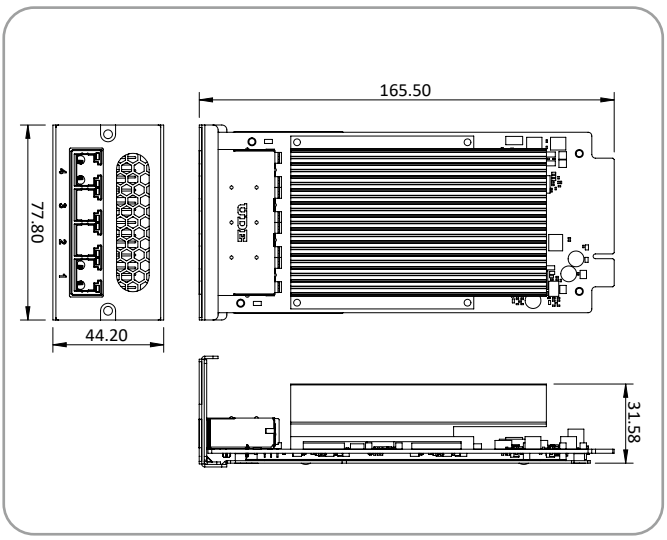
Packing List

1 x PulM-10G4T-AQC107 module	1 x L-shaped T10 PulM wrench
2 x Torx screws	1 x QIG

Ordering Information

Part No.	Description
PulM-10G4T-AQC107-R10	Aquantia AQC107 based network interface card with four 10GBASE-T by 4 PCIe 3.0 x2 interface

Dimensions (Unit: mm)



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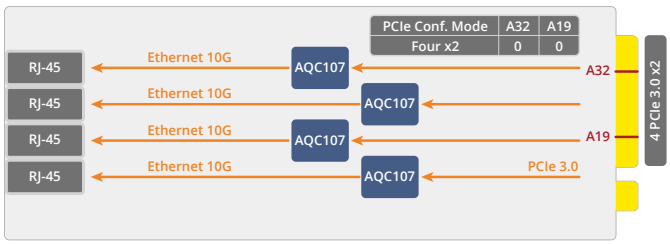
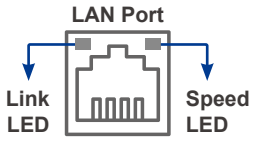




LED	State	Description
Link (Left)	Yellow	Active
Speed (Right)	Orange	10 Gbps data rate
	Green	5 Gbps/1 Gbps/100 Mbps data rate

PulM-1G8T-BCM5720

Broadcom BCM5720 based Network Interface Card with Eight RJ-45 by 4 PCIe 2.0 x2 Interface

Features

- 4 x Broadcom BCM5720
- 8 x RJ-45 connector
- 4 PCIe 2.0 x2
- RoHS compliant

Specifications

Model Name	PulM-1G8T-BCM5720
Form Factor	IEI Networking Module - PulM
NIC	Broadcom BCM5720
LAN Bypass	N/A
LAN Interface	1 GbE RJ-45
Ports	8
Host Interface	4 PCIe 2.0 x2
Operating Temp	0 ~ 40ºC
Humidity	5% ~ 90% RH, Non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)
Compliance	RoHS

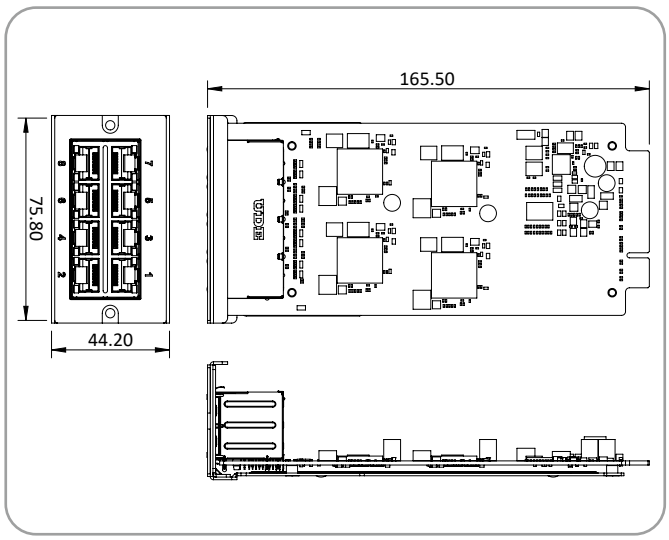
Packing List

1 x PulM-1G8T-BCM5720 module	1 x L-shaped T10 PulM wrench
2 x Torx screws	1 x QIG

Ordering Information

Part No.	Description
PulM-1G8T-BCM5720-R10	Broadcom BCM5720 based network interface card with eight RJ-45 by 4 PCIe 2.0 x2 interface

Dimensions (Unit: mm)



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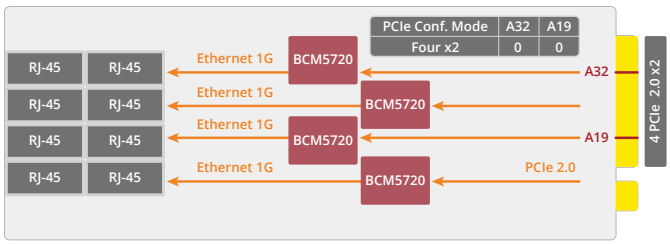
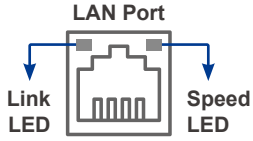




LED	State	Description
Link (Left)	Yellow	Active
Speed (Right)	Orange	1 Gbps data rate
	Green	100 Mbps data rate

PuIM-25G2SF-MLX

Mellanox ConnectX-4 Lx based Network Interface Card Support Dual 25GbE with Two SFP28 and PCIe 3.0 x8 Interface

Features

- 1 x Mellanox ConnectX-4 Lx EN
- 2 ports 25 GbE SFP28 connector
- PCIe 3.0 x8
- RoHS/CE/FCC compliant

Specifications

Model Name	PuIM-25G2SF-MLX
Form Factor	IEI Networking Module - PuIM
NIC	Mellanox ConnectX-4 Lx EN
LAN Bypass	N/A
LAN Interface	25 GbE SFP28
Ports	2
Host Interface	PCIe 3.0 x8
Operating Temp	0 ~ 40°C
Humidity	5% ~ 90% RH, Non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)
Compliance	RoHS/CE/FCC

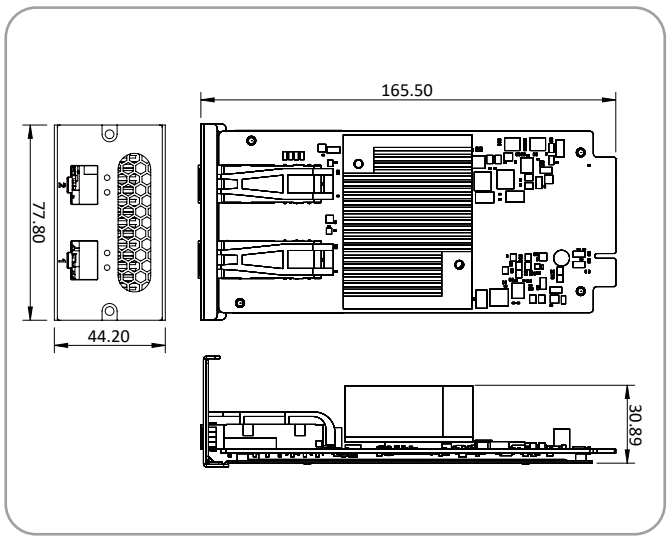
Packing List

1 x PuIM-25G2SF-MLX module	1 x L-shaped T10 PuIM wrench
2 x Torx screws	1 x QIG

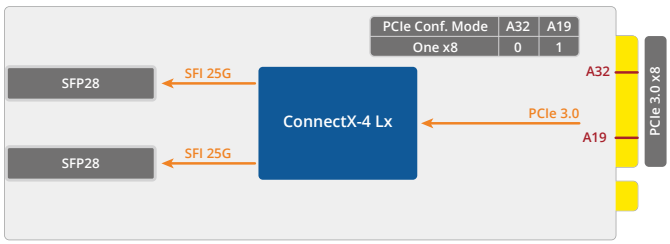
Ordering Information

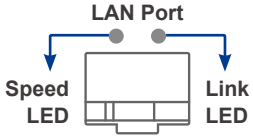
Part No.	Description
PuIM-25G2SF-MLX-R10	Mellanox ConnectX-4 Lx based network interface card supporting dual 25GbE with two SFP28 by 1 PCIe 3.0 x8 interface

Dimensions (Unit: mm)



Block Diagram





LED	State	Description
Link (Right)	Yellow	Active
Speed (Left)	Green	25 Gbps data rate
	Yellow	10 Gbps/1 Gbps data rate

PuIM-10G4SF-MLX

Mellanox ConnectX-4 Lx based Network Interface Card Support Quad 10GbE with Four SFP+ by 2 PCIe 3.0 x4 Interface

Features

- 2 x Mellanox ConnectX-4
- 4 x 10 GbE SFP+ connector
- 2 PCIe 3.0 x4
- RoHS compliant

Specifications

Model Name	PuIM-10G4SF-MLX
Form Factor	IEI Networking Module - PuIM
NIC	Mellanox ConnectX-4
LAN Bypass	N/A
LAN Interface	10 GbE SFP+
Ports	4
Host Interface	2 PCIe 3.0 x4
Operating Temp	0 ~ 40°C
Humidity	5% ~ 90% RH, Non-condensing
Dimensions (mm)	165.50 (L) x 77.8 (W) x 44.2 (H)
Compliance	RoHS

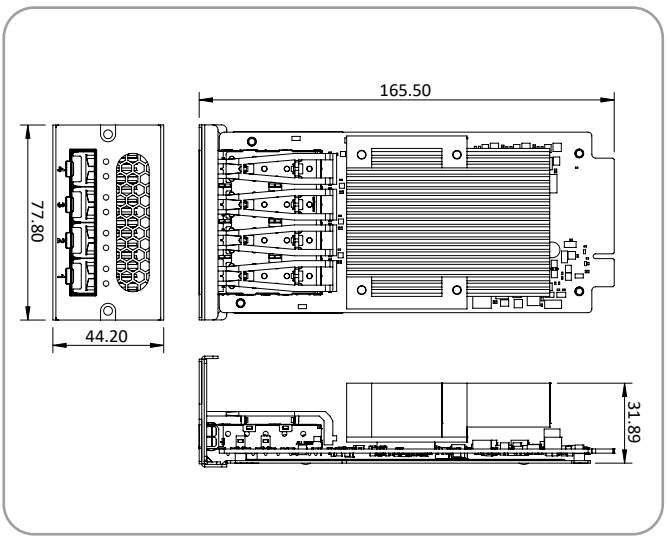
Packing List

1 x PuIM-10G4SF-MLX module	1 x L-shaped T10 PuIM wrench
2 x Torx screws	1 x QIG

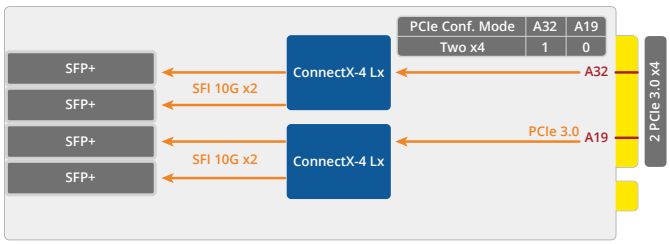
Ordering Information

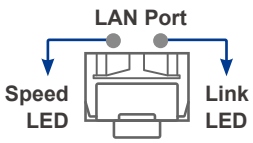
Part No.	Description
PuIM-10G4SF-MLX-R10	Mellanox ConnectX-4 Lx based network interface card supporting quad 10GbE with four SFP+ by 2 PCIe 3.0 x4 interfaces

Dimensions (Unit: mm)



Block Diagram





LED	State	Description
Link (Right)	Yellow	Active
Speed (Left)	Green	10 Gbps data rate
	Off	1 Gbps/100 Mbps data rate

*Specifications are subject to change without prior notice.

Headquarters
威強電工業電腦 IEI Integration Corp.
No. 29, Zhongxing Rd., Xizhi Dist., New Taipei City 221, Taiwan
TEL : +886-2-86916798 / +886-2-26902098 FAX : +886-2-66160028
sales@ieiworld.com www.ieiworld.com

America
IEI Technology USA Corp.
138 University Parkway, Pomona, CA 91768
TEL : +1-909-595-2819 FAX : +1-909-595-2816
sales@usa.ieiworld.com usa.ieiworld.com

China
威强电工业电脑 IEI Integration (Shanghai) Corp.
上海市闵行莘庄工业区申富路515号
515, Shen Fu Rd., Xin Zhuang Industrial Develop Zone, Shanghai, 201108, China
TEL:+86-21-3116-7799 FAX:+86-21-3462-7797
sales@ieiworld.com.cn www.ieiworld.com.cn

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