

# PUZZLE-M901

# PUZZLE-M902

## Software Defined Router for Small and Medium Business

10G/2.5G/1G high performance router

VPN server supporting IPSec/SSL

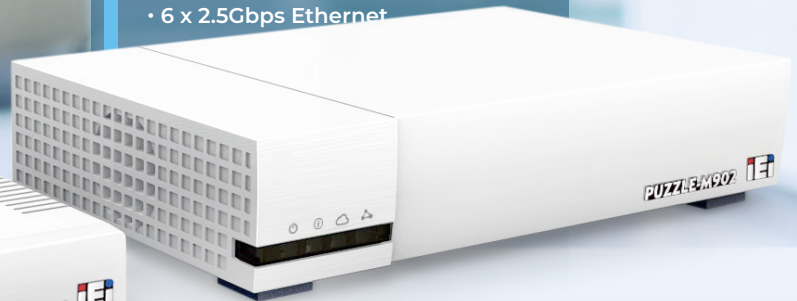
Rich network application expendable

### PUZZLE-M901

- Marvell CN9130 2.2 GHz 64-bit SoC
- 6 x 2.5Gbps Ethernet

### PUZZLE-M902

- Marvell CN9130 2.2 GHz 64-bit SoC
- 3 x 10Gbps Ethernet
- 6 x 2.5Gbps Ethernet



# PUZZLE-M901/M902 Series Technology

## A high speed software defined router for small and medium business

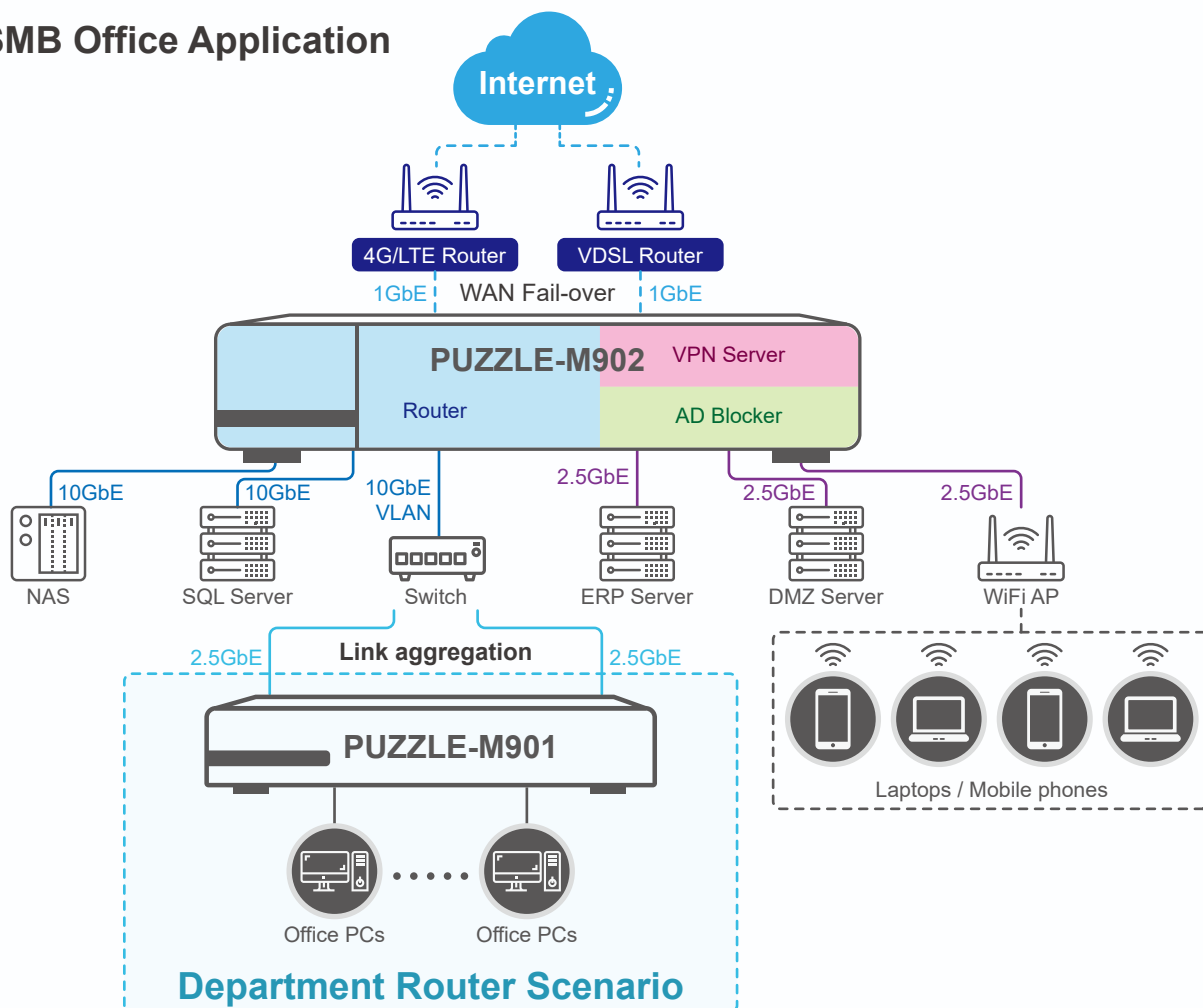
The PUZZLE-M901 and the PUZZLE-M902 are IEI's high-speed software defined routers powered by OpenWrt. The integrated 2.5GbE and 10GbE (M902) ports are ideally suited for a wide range of applications, such as SOHO and SMB networking infrastructure. The network interfaces can be defined with various combination to adopt the SMB network environment. Additionally, its function can also be expanded by open source applications supported in the OpenWrt community.



**PUZZLE-M901**  
**PUZZLE-M902**

	PUZZLE-M901	PUZZLE-M902
CPU	Marvell® CN9130	Marvell® CN9130
LAN ports	6 x 2.5 GbE	6 x 2.5 GbE 3 x 10 GbE

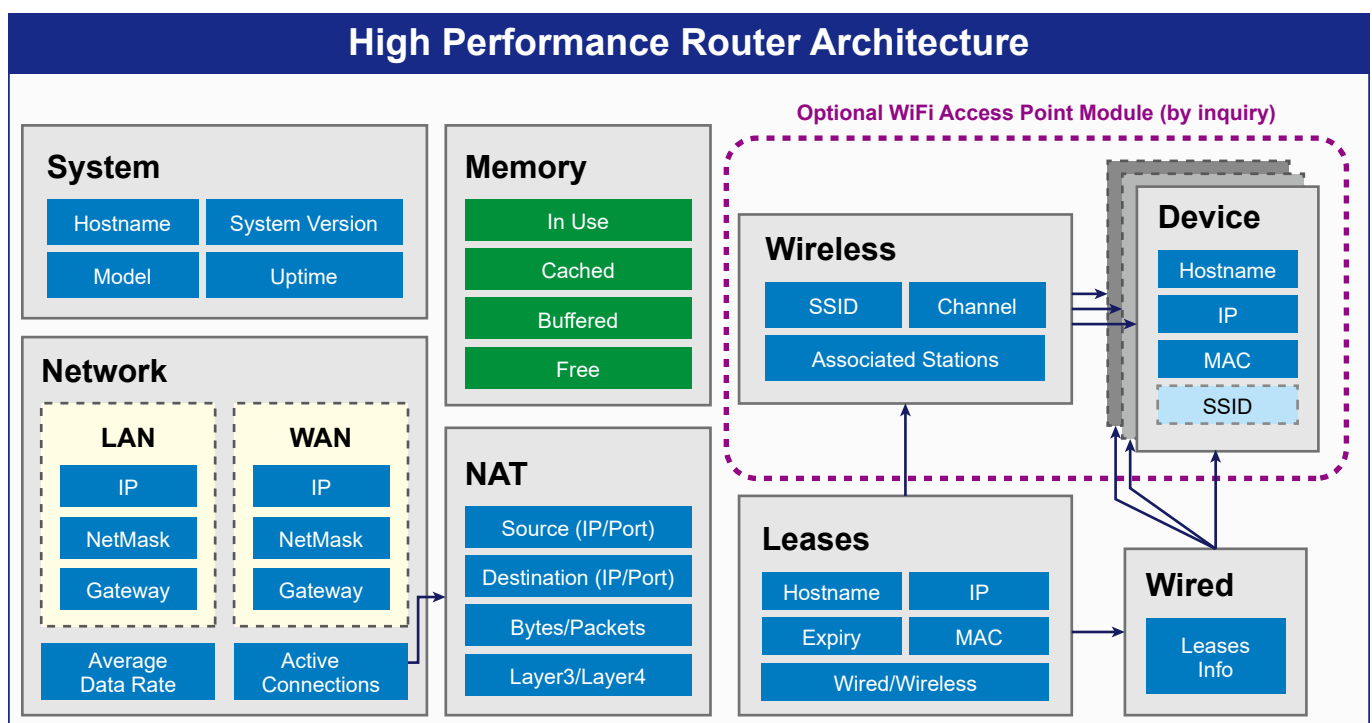
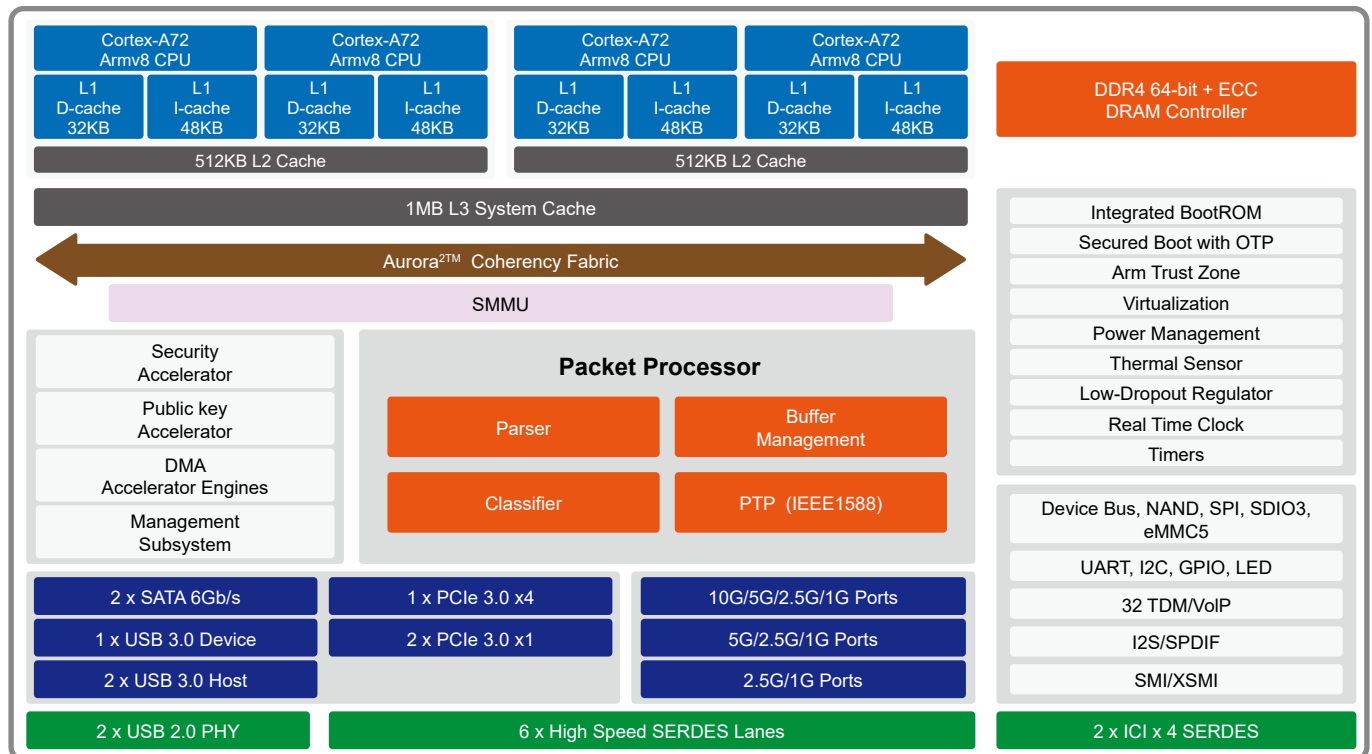
## SMB Office Application



# Marvell CN9130 SoC

The Marvell CN9130 is a quad-core Armv8 Cortex-A72 system-on-chip (SoC). The high-performance processor offers a complete function and acceleration for the networking and security applications.

- Four Cortex-A72 CPU: provide the computing power of application
- Integrated high-speed network interfaces linked to internal high-bandwidth bus
- Packet processor accelerates the packet processing for the NAT, QoS and packet filtering
- Security accelerator offloads the processor on multiple IPSec/SSL VPN tunneling





# OpenWrt

- An open source project based on Linux-based embedded operating system, used on embedded devices to route network traffic.
- The main components are Linux, util-linux, musl and BusyBox. All components are optimized to make them small enough to fit the limited storage and memory available to home routers.
- Use the command line interface (ash shell) or the web interface (LuCI) to configure OpenWrt. Approximately 3,500 optional software packages can be installed through the opkg package management system.

## Features

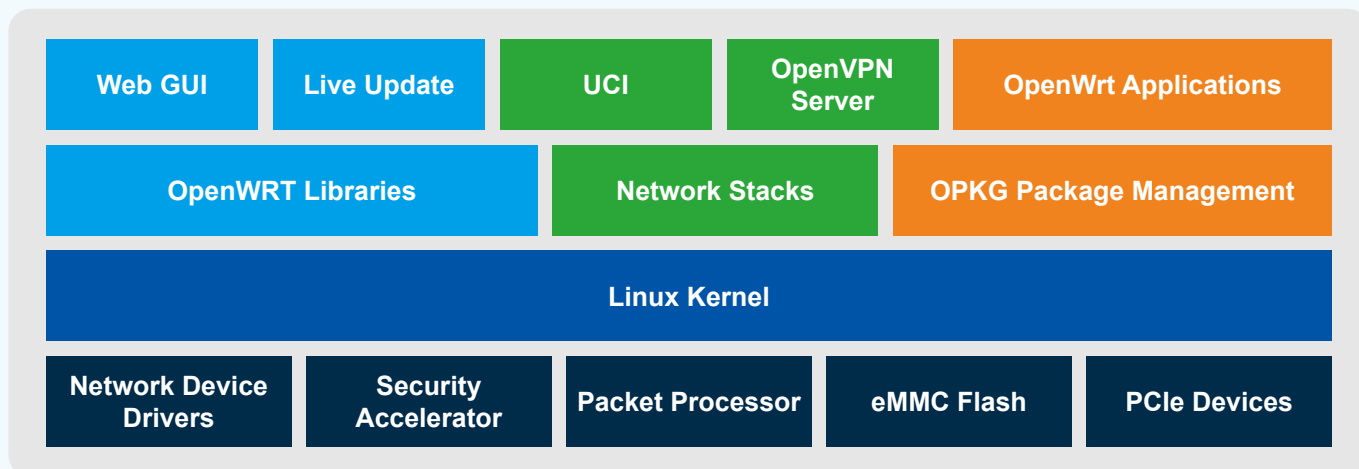
OpenWrt provides detailed possibilities to configure common network-related functions, such as IPv4, IPv6, DNS, DHCP, VPN, shadowsocks, DLNA, routing, Dynamic DNS, firewall, NAT, port forwarding, file sharing via SAMBA, NFS, FTP, SFTP and MQ Telemetry Transport through Mosquitto.

## OpenWrt Package

- IP tunneling (GRE, OpenVPN, pseudowire, shadowsocks, etc.)
- Scalable real-time network monitoring and statistical information, such as RRDtool, Gathering, Nagios, Munin lite, Zabbix
- Dynamic DNS service can maintain a fixed domain name through an ISP that does not provide a static IP address, etc.
- Load balancing used with multiple ISPs using source-specific routing
- Dynamically-configured port forwarding protocols UPnP and NAT-PMP through upnpd, etc.

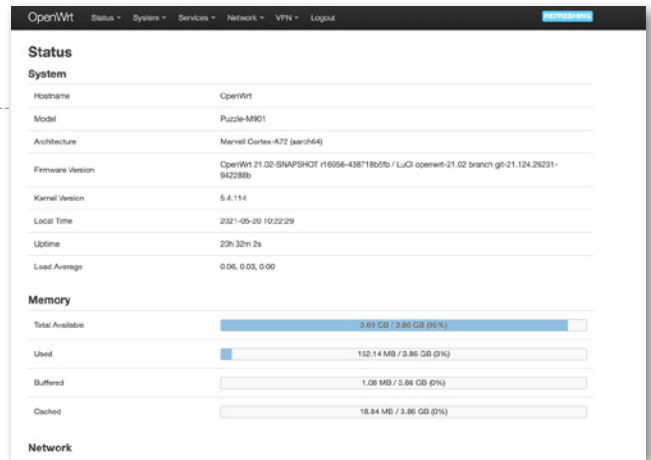
## OpenWrt Software Architecture

OpenWrt uses the common embedded Linux tools such as uClibc, busybox, shell interpreter and provides a hardware abstraction layer and package manager. Here is the software stack that OpenWrt uses:



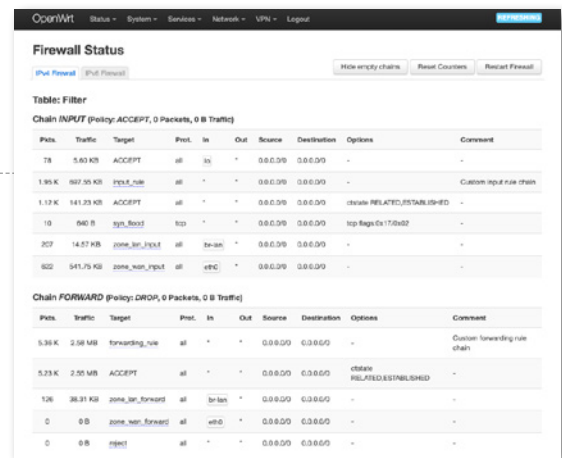
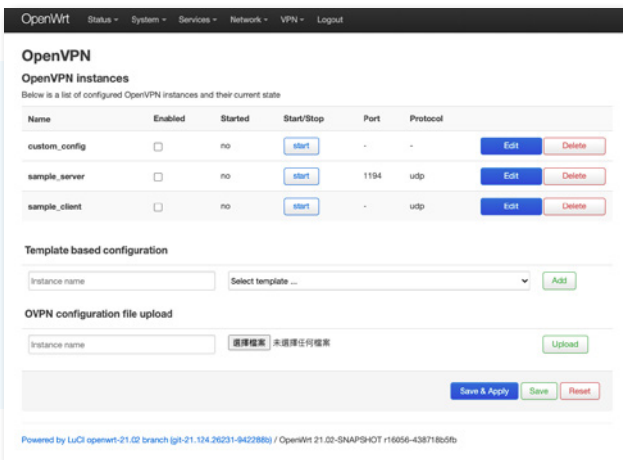
# OpenWrt

The PUZZLE-M901/M902 uses OpenWrt OS to provide a user-friendly web interface, a clear dashboard and port indicators to help you handle daily network management tasks. Users can not only efficiently manage all connected wires through OpenWrt OS in real time, but also configure firewall, VPN, security and advanced network functions.



# OpenVPN

OpenVPN is a virtual private network (VPN) system that implements techniques to create secure point-to-point or site-to-site connections in routed or bridged configurations and remote access facilities. It implements both client and server applications.

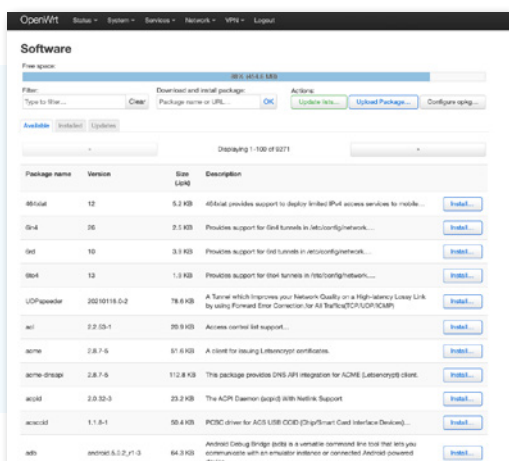


# Firewall

OpenWrt uses the firewall3 (fw3) netfilter/iptables rule builder application. It runs in user-space to parse a configuration file into a set of iptables rules, sending each to the kernel netfilter modules.

# Software Manager

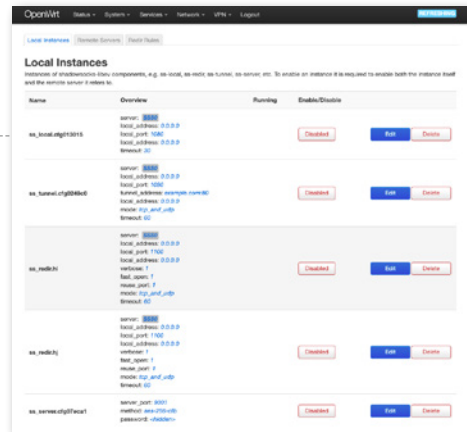
There are multiple packages available in the OpenWrt package repository.



# Example of Free OpenWrt Software Package

## Shadowsocks

Shadowsocks is not a proxy on its own, but (typically) is the client software to help connect to a third-party SOCKS5 proxy, which is similar to a Secure Shell (SSH) tunnel. Once connected, internet traffic can then be directed through the proxy.

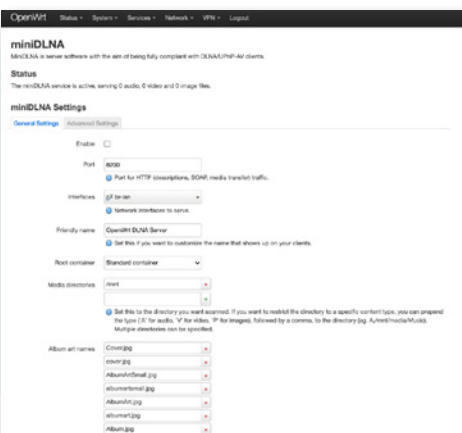
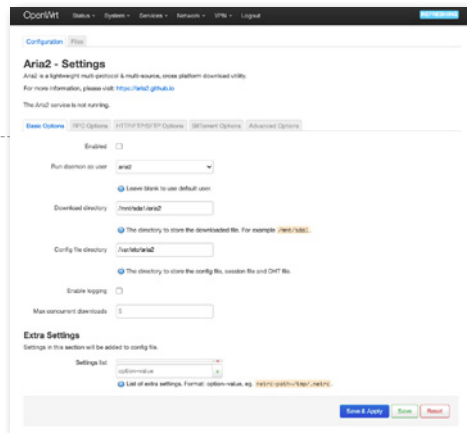


## Ad blocking

Ad blocking or ad filtering is a software capability for blocking or altering online advertising in a web browser or an application.

## Aria2

Aria2 is a lightweight multi-protocol & multi-source command-line download utility. It supports HTTP/HTTPS, FTP, SFTP, BitTorrent and Metalink. Aria2 can be manipulated via built-in JSON-RPC and XML-RPC interfaces.

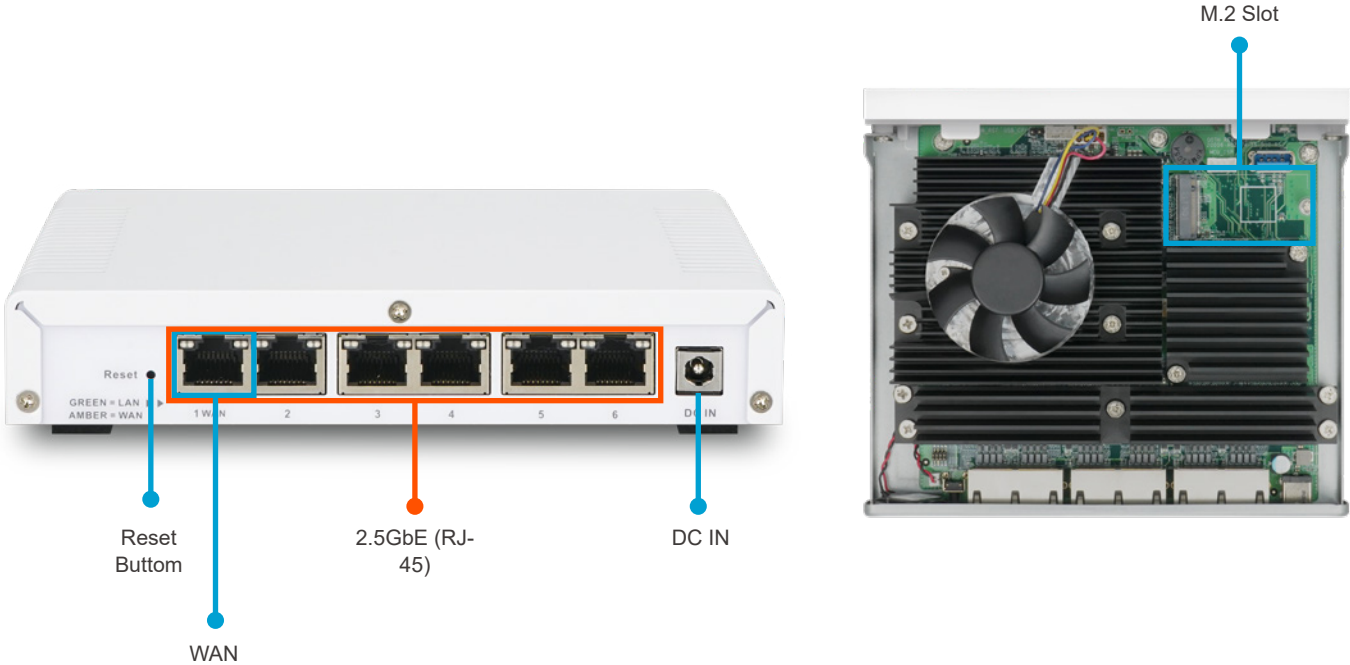


## DLNA Media Server

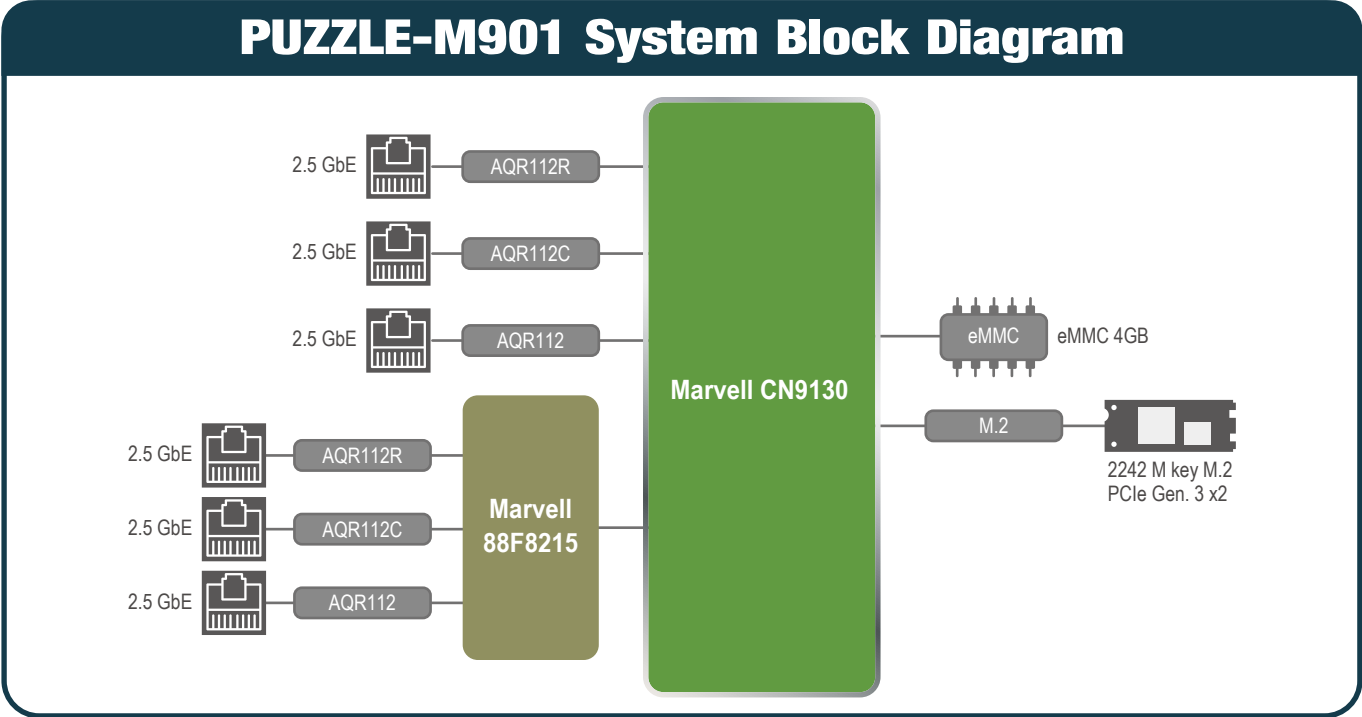
Based on the official DLNA standard, this service streams pictures, videos and music of a given media folder to DLNA-capable entertainment devices on the same network (e.g. modern Smart-TVs).



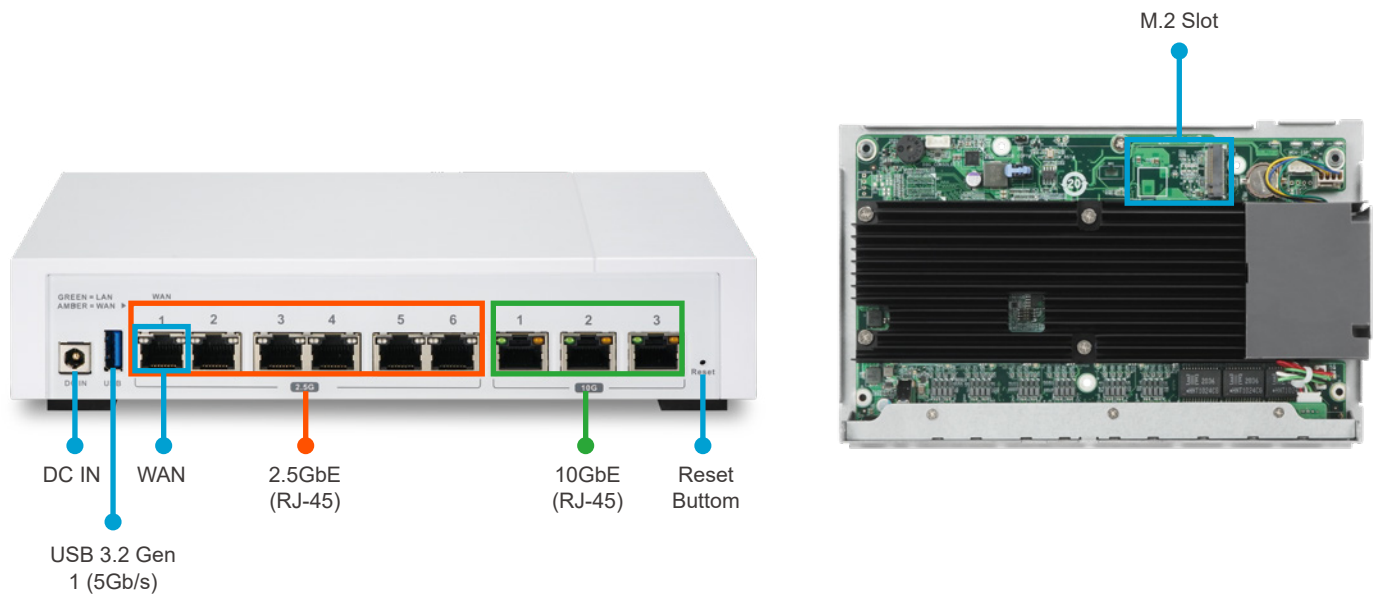
# PUZZLE-M901 Connection Configuration



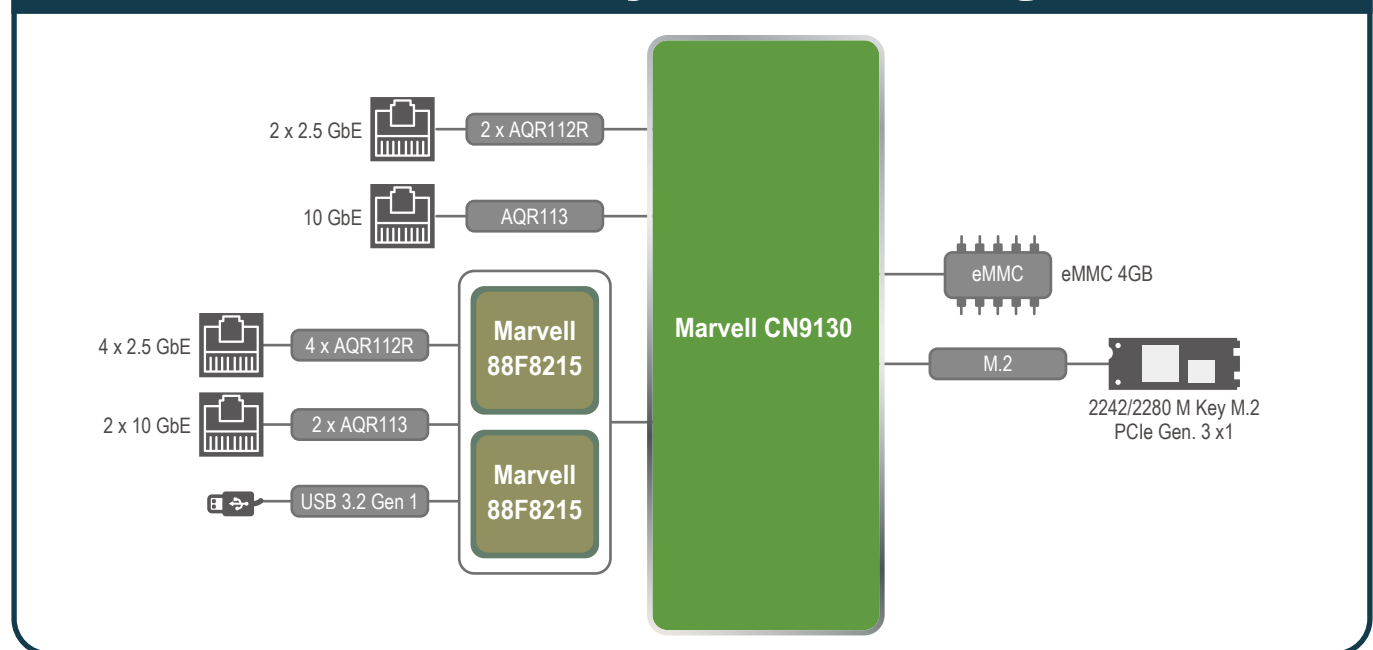
## PUZZLE-M901 System Block Diagram



# PUZZLE-M902 Connection Configuration



## PUZZLE-M902 System Block Diagram





# PUZZLE-M901



## Features

- Marvell CN9130 quad-core Armv8 cortex-A72<sup>®</sup> up to 2200 MHz
- Six 2.5 GbE RJ-45 ports
- Onboard 4 GB eMMC, one console port (pin-header)
- LED indicators : Status/Power & WAN/LAN, interface indicator
- Pre-installed OpenWrt
- Support 2242 M key M.2 PCIe Gen3 x2

## Specifications

		PUZZLE-M901
Form Factor	Desktop	Desktop
	CPU	Marvell® CN9130 quad-core Armv8 Cortex-A72 @ up to 2200 MHz
	eMMC	1 x 4GB eMMC
	M.2 SSD Slot/Specs	1 x 2242 M key M.2 PCIe Gen. 3 x2
Networking	Ethernet IC	Aquantia AQR112R
		Aquantia AQR112C
		Aquantia AQR112
	Ethernet Port	1 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112R
		1 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112C
		1 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112
External I/O	USB	USB 3.2 Gen 1 (5Gb/s)
	Reset Button	1 x Reset Factory Button
	System Cooling	Active Fan
Physical and Environmental	Storage Temperature	-20°C ~ 75°C (-4°F ~ 167°F)
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)
	Relative Humidity	5~95% non-condensing, wet bulb: 27°C
	Dimensions (W x L x H) (mm)	166.4 x 145.7 x 34
OS and Certifications	Certification	CE/FCC/BSMI (BSMI safety)/VCCI, LVD
	Operating System	OpenWrt
	Forum	<a href="#">OpenWrt forum</a>
	FAQ	<a href="#">OpenWr FAQ</a>
Indicators	LED Indicators	Status/Power, WAN/LAN interface indicator
	System Warning	Beep

# PUZZLE-M902

Desktop network appliance with Marvell CN9130 processor, six 2.5GbE and three 10 GbE, on-board 4GB eMMC, one M.2 slot



## Features

- Marvell CN9130 quad-core Armv8 cortex-A72<sup>®</sup> up to 2200 MHz
- Six 2.5 GbE RJ-45 ports & Three 10 GbE RJ-45 ports
- Onboard 4 GB eMMC, one console port (pin-header)
- LED indicators : Status/Power & WAN/LAN, interface indicator
- Pre-installed OpenWrt
- Support 2242/2280 M key M.2 PCIe Gen3 x1

## Specifications

		PUZZLE-M902
Form Factor	Desktop	Desktop
	CPU	Marvell® CN9130 quad-core Armv8 Cortex-A72 @ up to 2200 MHz
Memory	eMMC	1 x eMMC 4GB
	M.2 SSD Slot/Specs	1 x 2242/2280 M Key M.2 PCIe Gen. 3 x1
Networking	Ethernet IC	Aquantia AQR112R
		Aquantia AQR113
	Ethernet Port	2 x 2.5GbE LAN integrated in CPU via PHY Aquantia AQR112R
		4 x 2.5GbE LAN via Marvell 88F8215 (PHY: Aquantia AQR112R)
	1 x 10GbE LAN integrated in CPU via PHY Aquantia AQR113	
	2 x 10GbE LAN via Marvell 88F8215 (PHY: Aquantia AQR113)	
External I/O	USB	USB 3.2 Gen 1 (5Gb/s)
Power and Mechanical	Reset Button	1 x Reset Factory Button
	System Cooling	1 system fan
Physical and Environmental	Storage Temperature	-20°C ~ 75°C (-4°F ~ 167°F)
	Operating Temperature	0°C ~ 40°C (32°F ~ 104°F)
	Relative Humidity	5~95% non-condensing, wet bulb: 27°C
	Dimensions (W x L x H) (mm)	226 x140 x 50.5
OS and Certifications	Certification	CE/FCC/BSMI (BSMI safety)/VCCI, LVD
	Operating System	OpenWrt
	Forum	<a href="#">OpenWrt forum</a>
	FAQ	<a href="#">OpenWr FAQ</a>
Indicators	LED Indicators	Status/Power, WAN/LAN interface indicator
	System Warning	Beep

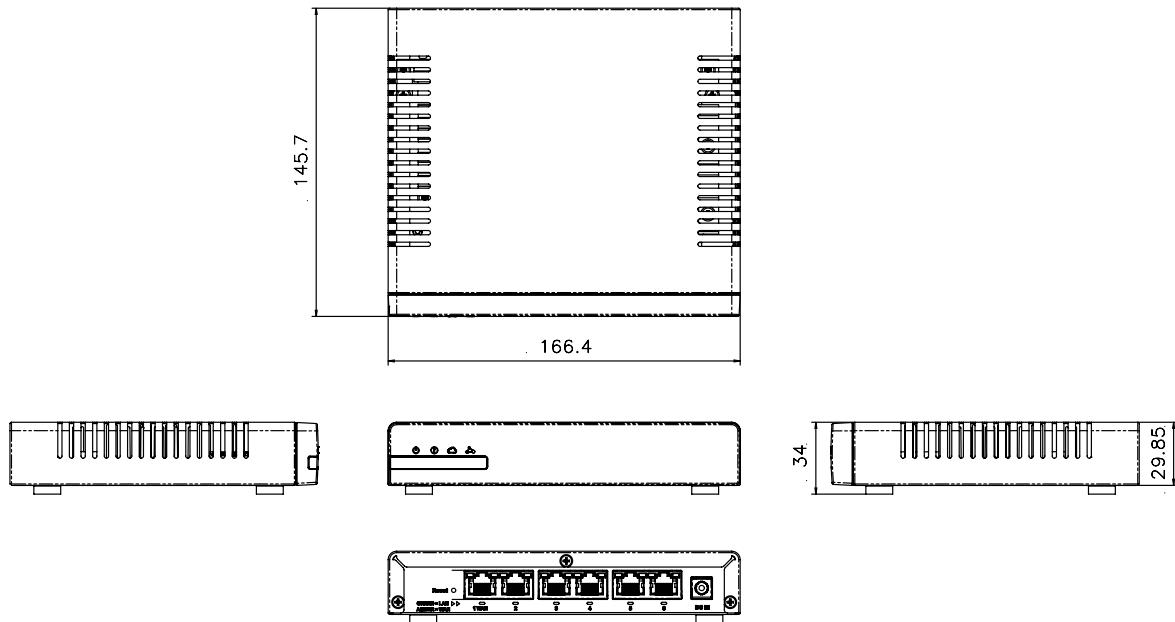
### Ordering Information

Part No.	Description
PUZZLE-M901-CN1-R10	Desktop network appliance with Marvell CN9130 processor, six 2.5GbE, on-board 4GB eMMC, one M.2 slot, RoHS
PUZZLE-M902-CN1-R10	Desktop network appliance with Marvell CN9130 processor, six 2.5GbE and three 10 GbE, on-board 4GB eMMC, one M.2 slot, RoHS

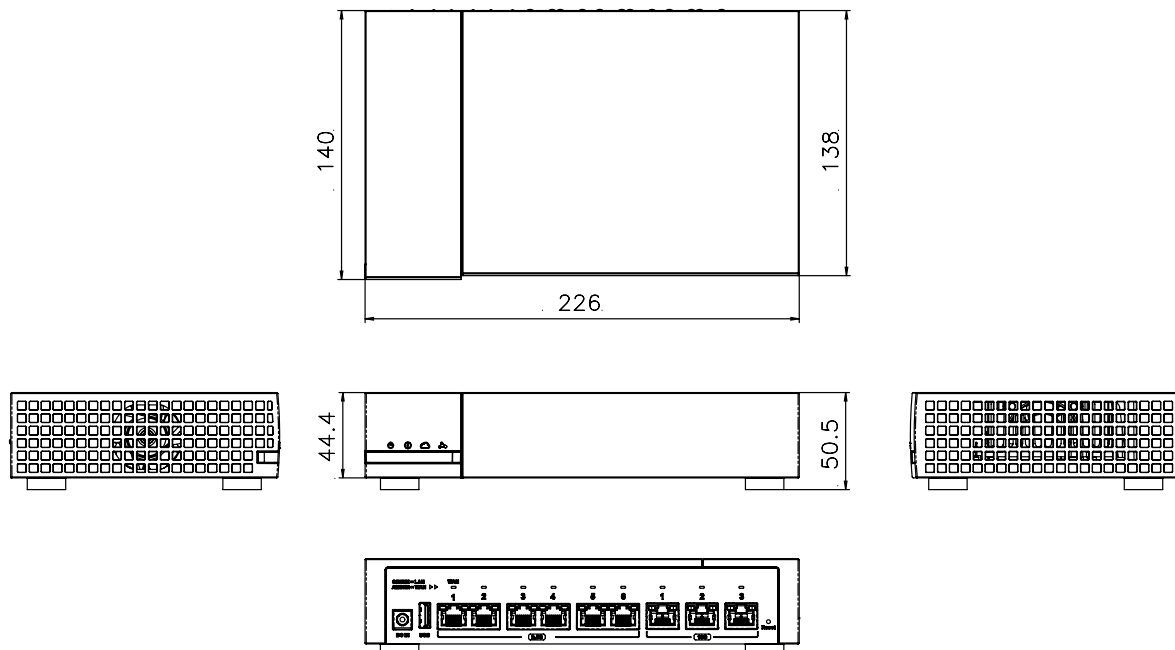
### Packing List

	PUZZLE-M901-CN1-R10	PUZZLE-M902-CN1-R10
Power cord	1	1
Power adapter	1	1

#### PUZZLE-M901 Dimensions (Unit: mm)

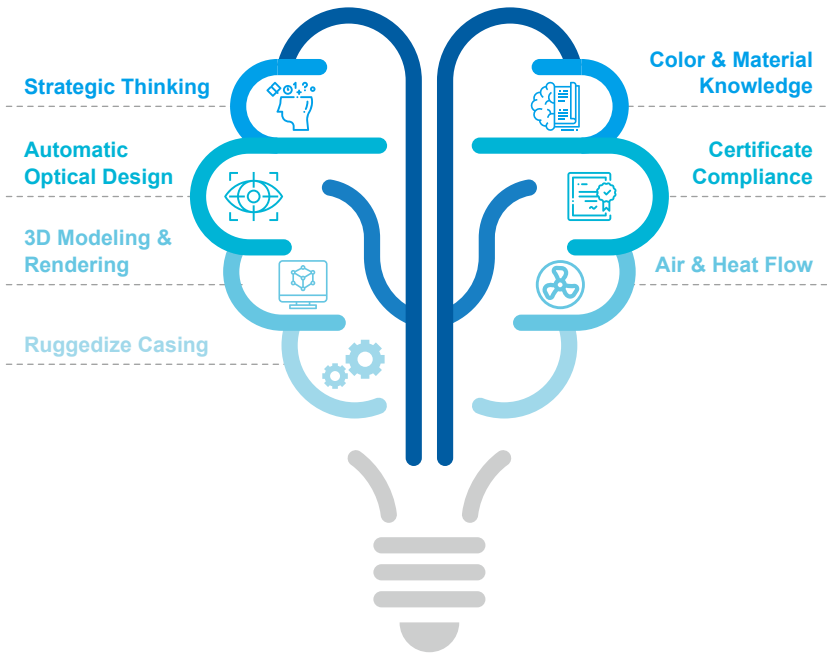


#### PUZZLE-M902 Dimensions (Unit: mm)



# ODM Service

*Zero to One, Build the Future*



IEI has more than 20-year IPC knowledge and has delivered hundreds of ODM projects covering different industries. Accumulated know-how makes us easier to communicate with customers and understand their needs. In addition, we provide a wide range of computing products for various industries and allow customers to customize our standard products. Product development and manufacture experiences allow us to provide quick responses to customers' requirements and meet or exceed customers' expectations to save development time and cost.

## Advanced Network Customized Solutions





\*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**

威強電工業電腦 IEI Integration (Shanghai) Corp.

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