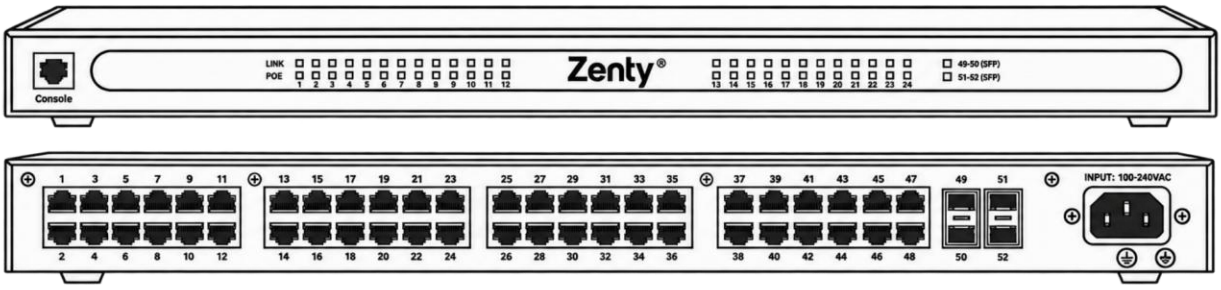
ZT-IPSW48P

ZT-420 | 48-Port Gigabit PoE+ • 4 x 10G Uplinks • 550W PoE Budget • Managed AV-over-IP Switch

Built on the Realtek RTL9311 high-density 1U switching platform for professional AV, providing high-bandwidth multicast, centralized PoE, and advanced management for audio, video, and control over IP.



ZT-IPSW48P • Front Panel • Rear Panel

48 × 1G PoE+ Access Ports	**4 × 10G** High-Speed Uplinks	**550W** PoE Power Budget	**176 Gbps** Switching Capacity

01 Designed for High-Density AV-over-IP Networks

ZT-IPSW48P combines a Realtek RTL9311 Layer 3 managed switching platform with 48 Gigabit PoE+ access ports and four 10G SFP+ uplinks. Its 176 Gbps switching capacity, 550W PoE budget, multicast controls, and QoS capabilities support large-scale AV, digital signage, control-room, and enterprise AV networks. IGMP Snooping, IGMP Querier, Fast Leave, 9000-byte jumbo frames, and port flow control are enabled by default.

AV-over-IP Pre-configuration Factory-enabled multicast, jumbo-frame, flow-control, and PoE baselines reduce on-site setup.	**Centralized PoE+** Centralized power delivery and port management for encoders, decoders, and other endpoints.
Front Service Access The front-mounted console simplifies local configuration and troubleshooting.	**AV Rack-Friendly Layout** Standard 19-inch 1U chassis with rear-facing network and power connections plus side-mounted cooling.

Typical Applications

Whole-Home AV Centralized connectivity for AV encoders, decoders, controllers, and PoE endpoints in residential low-voltage and AV racks.	**Meetings & Collaboration** Low-latency IP audio/video networking for conference rooms, training rooms, and multipurpose spaces.
Digital Signage Efficient multicast distribution for retail, hospitality, education, and public information displays.	**Video Walls & Control Rooms** Aggregate multiple high-bitrate media streams over 10G uplinks, with QoS and multicast control for predictable operation.

02 Network Architecture & System Design

ZT-IPSW48P scales from a high-density single-switch access layer to dual-switch cross-zone and three-switch star architectures.

> **Recommended AV-over-IP Baseline**
>
> The recommended baseline applies to typical Zenty IP300, IP400, and IP700 single-switch, single-AV-VLAN systems. Confirm final parameters against endpoint bandwidth, multicast behavior, and the relevant vendor's network guide.

Platform Compatibility & Deployment Scope

- Built on standard Ethernet and IP multicast mechanisms, ZT-IPSW48P can be deployed with Dante, AES67, Crestron DM NVX, Extron NAV, and other systems when configured to meet each vendor's IGMP, VLAN, QoS, PTP, and EEE requirements.
- Third-party interoperability and suitability of the factory configuration must be validated through interoperability testing and the relevant vendor's network guide. Timing, QoS, VLAN, multicast, EEE, and firmware requirements may vary.

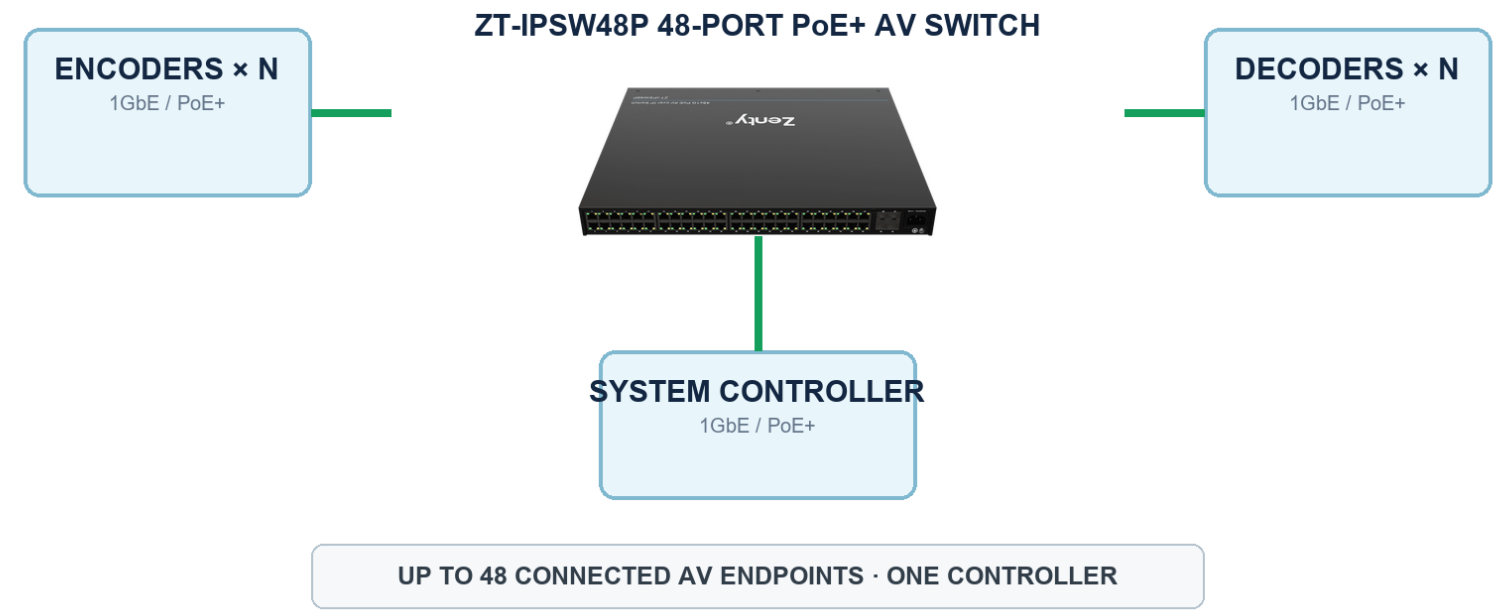
Three Recommended Deployment Models

- **Single-Switch High-Density Access** | Connect encoders, decoders, and controllers in the combination required by the project. Suitable for large residential AV, conference centers, sports venues, hospitality, digital signage, and control rooms.
- **Dual-Switch Cross-Zone** | Designed for two floors, rooms, or building zones. The example uses a 2 × 10G SFP+ LACP connection, with one controller managing both zones.
- **Three-Switch Star** | One core switch connects two edge switches, using a separate 2 × 10G LACP group for each uplink direction.

Multi-Switch Design Guidelines

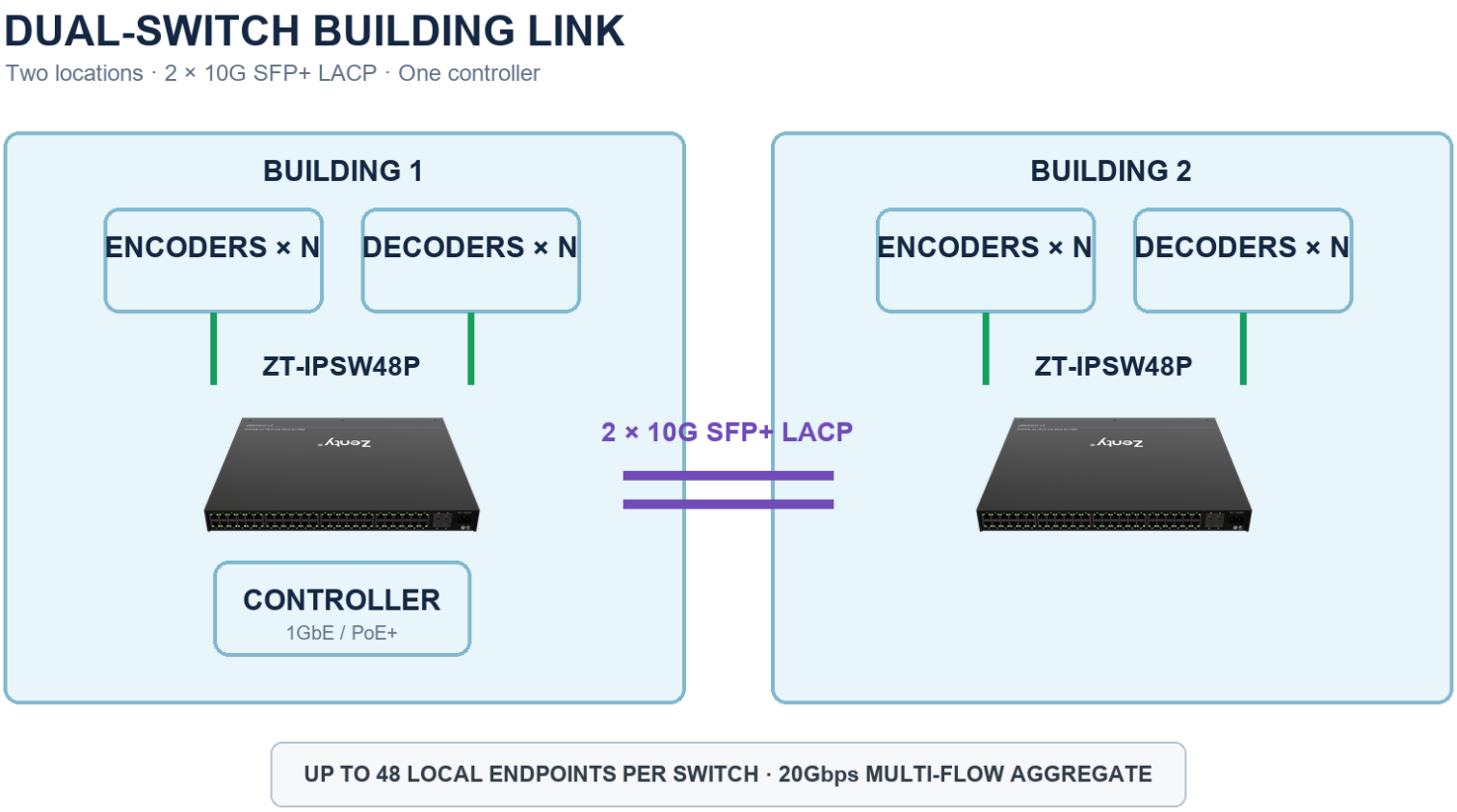
- For every dual-link example in this section, configure IEEE 802.3ad LACP at both ends before connecting or enabling the second link. Never connect two parallel links unless they are members of the same aggregation group.
- A single 10G uplink does not require LACP, but provides less aggregate bandwidth and no link-level redundancy. A 2 × 10G LAG provides up to 20 Gbps of aggregate multi-flow bandwidth; an individual flow typically remains limited to one 10G member link.
- Before interconnecting switches, assign each switch a unique management IP address. Keep AV VLAN, trunk, IGMP, jumbo-frame, and flow-control settings consistent across the fabric. Define an IGMP Querier strategy for each AV VLAN and verify the election result.
- Use Fast Leave only on access ports directly connected to a single AV endpoint. Validate it before enabling it on switch uplinks or downstream ports that may serve multiple receivers.
- Size uplinks for the worst-case traffic direction, with headroom for encoder bursts, bidirectional media, control traffic, and future expansion.

Topology 1 | Plug-and-Play Single-Switch Deployment



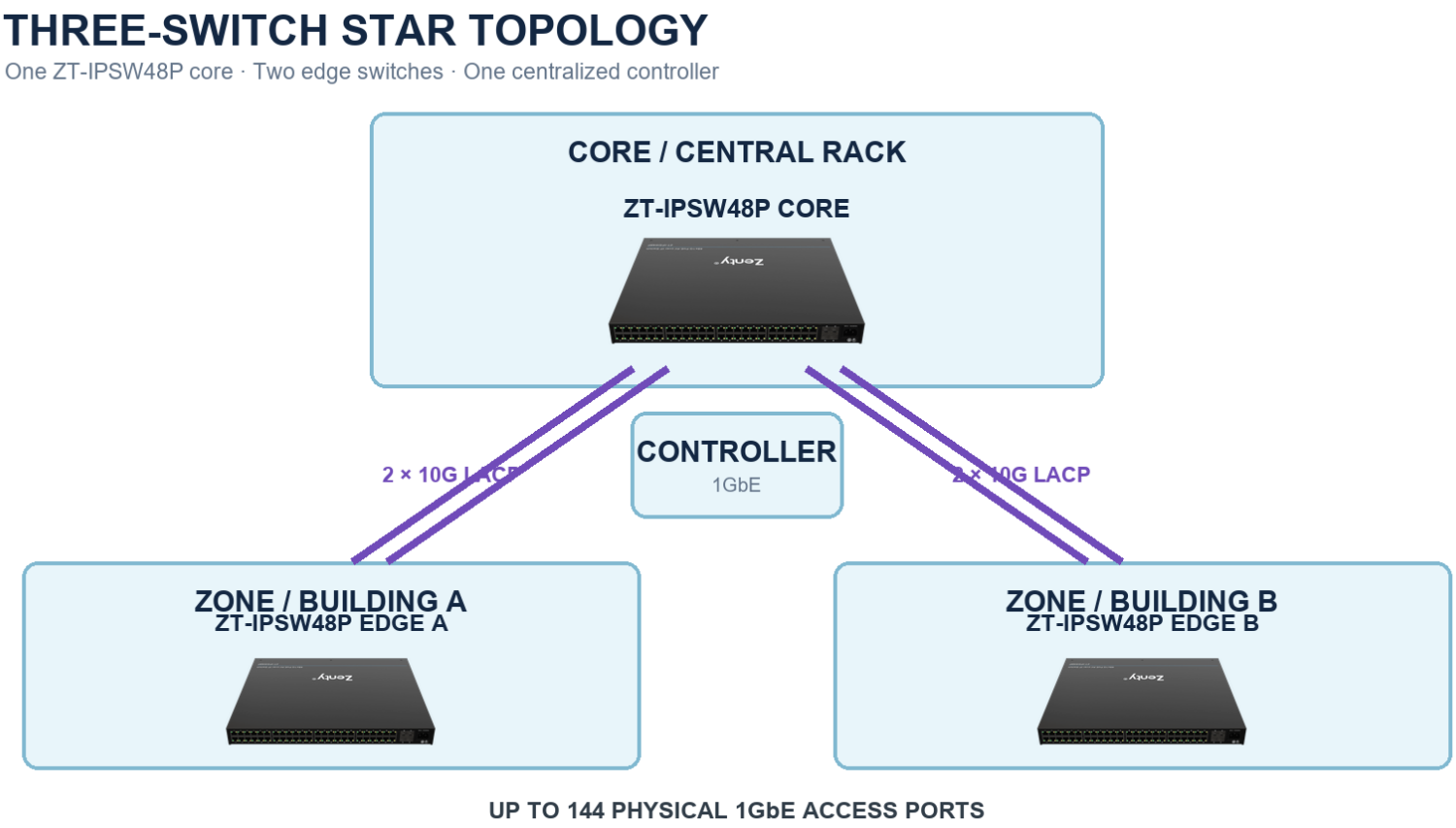
Supports up to 48 AV endpoints under one AV-over-IP controller. Encoders and decoders may be combined in any ratio required by the project.

Topology 2 | Dual-Switch Cross-Zone Link



Two ZT-IPSW48P switches are interconnected through a 2 × 10G SFP+ LACP group and managed by one controller across both zones.

Topology 3 | Three-Switch Star Architecture



The core uses separate 2 × 10G LACP groups to connect Edge A and Edge B. One controller connects to the core and manages all three zones.

03 Purpose-Built for AV-over-IP

The RTL9311 switching platform, 48-port centralized PoE, high-bandwidth uplinks, and professional rack design provide a scalable foundation for high-density AV-over-IP networks.

Mature Realtek RTL9311 Platform A Layer 3 managed switching platform provides the hardware foundation for high-density multicast, wire-speed forwarding, and routing.	**AV-Oriented Multicast Defaults** Supports IGMP/MLD Snooping and hardware multicast tables; IGMP Snooping, Querier, and Fast Leave are enabled by default on VLAN 1.
High-Bandwidth Uplinks Four 10G SFP+ ports provide capacity for switch interconnects, core links, and multi-stream aggregation.	**High-Density PoE Access** 48 Gigabit PoE+ ports, up to 30 W per port, sharing a 550W system PoE budget.
Granular QoS Eight hardware queues per port with CoS/DSCP classification and SP, WRR, and WFQ scheduling capabilities.	**Professional Cooling & Service** Front console, no dedicated MGMT port, and four automatically controlled side fans for active cooling in a 600 W-class system.

Typical Deployment Conditions

Network Scope	Typical single-switch deployment or a properly designed Layer 2 network
Endpoint Access	Untagged Ethernet endpoints with no VLAN segmentation requirement
Multicast	Standard IPv4 IGMP multicast
IP Addressing	Static IP, Auto-IP, or external DHCP
Bandwidth	Combined video, audio, USB, and control traffic remains within access-port and uplink capacity
Jumbo-Frame Path	If endpoints use jumbo frames, the entire path must support the same frame size

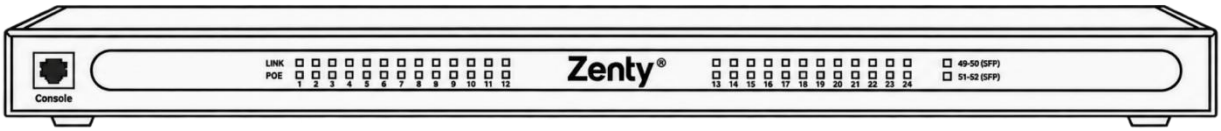
Factory AV-over-IP Configuration

- Service access: VLAN 1 by default; plan access/trunk modes and VLANs as required for multi-service or segmented deployments.
- Multicast defaults: IGMP Snooping, IGMP Querier, and Fast Leave are enabled on VLAN 1. Validate the Fast Leave strategy on uplinks and ports serving multiple receivers.
- Jumbo frames: all service and uplink ports are factory-configured for 9000 bytes.
- Flow control: enabled by default on all service and uplink ports; validate against endpoint-vendor requirements in complex networks.
- Management address: in-band management through service ports; default address 192.168.168.254/24 on VLAN 1.
- PoE: IEEE 802.3af/at is enabled by default on all 48 access ports; up to 30 W per port, sharing a 550W total budget.

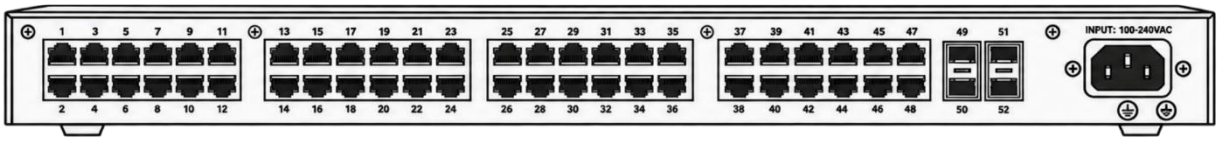
Deployment boundary: multiple AV platform segmentation, inter-VLAN multicast, multi-switch redundancy, or vendor-specific networks require appropriate VLAN, trunk, querier, and loop-protection design.

04 Clear, Organized, and Serviceable High-Density AV Rack Design

A front-mounted serial console supports local service, while 48 rear PoE ports, four 10G uplinks, and the AC input keep rack cabling organized. Four side-mounted fans provide automatic speed control and active cooling.



Front Panel: console, branding, and 52 groups of status indicators



Rear Panel: 48 x RJ45, 4 x 10 SFP+, and AC input

Front Panel Design

The front panel provides centralized link and PoE status indication for all 48 PoE access ports and four 10G uplinks.

A single front-mounted RJ45 serial console provides local service access. The switch has no dedicated management port.

Rear Connectivity for AV Racks

All 48 RJ45 PoE+ ports, four 10G SFP+ uplinks, and the AC input are rear-facing for organized rack-side cabling.

The clean front panel suits premium residential and commercial AV rack installations.

Standard 19-inch 1U metal chassis measuring 440 × 350 × 44 mm for professional AV and enterprise racks.

Rack Installation & Service Guidelines

Rack Space	Standard 19-inch rack, 1U; use the supplied rack ears and secure the unit
Airflow Clearance	Keep both sides unobstructed; do not block vents with cables, rack panels, or adjacent equipment
Cable Management	Route service and power cables at the rear; do not overbend or strain SFP+/DAC assemblies
Grounding	Connect protective earth and follow rack, power, and local electrical requirements
Service	Use the front-mounted console for local troubleshooting
Environment	0 °C to 40 °C operating temperature; 5% to 95% RH, non-condensing. Four automatically controlled fans require unobstructed airflow at full PoE load

05 Switching and Management for High-Bitrate Media

Multicast & AV Transport

IGMP	IGMP Snooping; Querier and Fast Leave enabled by default on VLAN 1
Multicast Status	Per-VLAN display of group addresses, member ports, and member versions
IPv6 Multicast	MLD Snooping
Jumbo Frame	9000 bytes, enabled by default on all service and uplink ports
Flow Control	IEEE 802.3x full-duplex flow control, enabled by default on all service and uplink ports
QoS	8 queues per port; CoS/DSCP classification; SP/WRR/WFQ support; default scheduling pending
Storm Control	Broadcast, multicast, unknown multicast, and unknown unicast control

Layer 2 & Resiliency

VLAN	IEEE 802.1Q; up to 4K VLAN entries; access/trunk modes; Q-in-Q capability
Link Aggregation	Static trunks and LACP
Spanning Tree	STP/RSTP/MSTP capability
LLDP	IEEE 802.1AB LLDP; bidirectional Rx/Tx; IEEE 802.1, IEEE 802.3, and LLDP-MED TLVs; local, neighbor, operational-status, and per-port statistics queries
Port Features	Port mirroring, rate limiting, loop detection, UDLD, and RMON

PoE Management

PoE Standards	IEEE 802.3af/802.3at (PoE/PoE+)
Per-Port Power	Up to 30 W/port
Total Power Budget	550W shared across all PoE ports
Monitoring	Per-port status, power, current, voltage, PD class, and PoE controller temperature
Automatic Recovery	PoE Watchdog, PD IP probing, query interval, timeout count, and power cycling
Policy	Per-port PoE enable/disable and time-based PoE schedules

Management & Security

Web, console CLI, SSH CLI, and SNMP management; supports saving running and startup configurations.

Front-mounted RJ45 serial console; no dedicated management port; in-band management through service ports.

CPU and memory utilization monitoring with threshold alarms. CPU Protect provides control-plane protection with classified rate limiting and discard statistics for ARP, ICMP, management, protocol, and IPv6 traffic sent to the CPU.

Supports ACLs, IEEE 802.1X, port security, DHCP Snooping, IP/MAC binding, logging, and RMON. Protocol versions, capacities, default settings, and security policies are subject to the final software feature matrix.

06 Technical Specifications

Interfaces & Performance

Access Ports	48 × 10/100/1000BASE-T RJ45 PoE+
Uplink Ports	4 × 10G SFP+ (1G compatibility pending)
Console	1 × RJ45 serial console, front panel

Dedicated MGMT	None; in-band management supported
Switching Capacity	176 Gbps
Packet Forwarding Rate	Up to 130.9 Mpps
MAC Address Table	32K
Packet Buffer	16 Mbit / 2 MB
ACL	Up to 4K shared VLAN/ingress/egress ACL entries (hardware resources shared with OpenFlow)
VLAN	4K VLAN entries
IPv4 Route Table	12K (network/host/combined definition pending)
Hardware Queues	8 hardware queues per standard port
Jumbo Frame	9000 bytes, enabled by default on all service and uplink ports

System, PoE & Physical Specifications

Switching Platform	Realtek RTL9311
CPU	Dual-core 1 GHz MIPS InterAptive
System Memory	256 MB DDR SDRAM (800 MHz; DDR generation pending)
Flash	32 MB SPI NOR
PoE	48 × IEEE 802.3af/at; enabled by default; up to 30 W/port
PoE Budget	550W shared across all PoE ports
Maximum System Power	600 W, including PoE output
AC Input	AC 100-240 V, 50/60 Hz
Dimensions	440 × 350 × 44 mm (W × D × H)

Rack Space	Standard 19-inch, 1U
Net Weight	Approx. 6.1 kg
Package Dimensions / Gross Weight	550 × 355 × 470 mm (dimension order pending) / approx. 6.5 kg
Enclosure	Metal
Cooling	Four side-mounted fans with automatic speed control and active cooling
Operating Temperature	0 °C to 40 °C
Storage Temperature	-40 °C to 75 °C
Operating Humidity	5% to 95% RH, non-condensing

Ordering & Delivery Information

Model	ZT-IPSW48P
Manufacturer Part Number	ZT-420
Product Category	AV-over-IP PoE+ Managed Switch
Mounting	19-inch rack mount, 1U
Package Contents	Switch, 4 rubber feet, 6 screws, AC power cord, 2 rack ears, user guide, and serial cable
Warranty	1 year
Certifications	CE/FCC/RoHS

ZT-IPSW48P combines the RTL9311 switching platform, 48 PoE+ access ports, 550W centralized power, four 10G uplinks, and rack-friendly design in one product, providing a scalable, manageable network foundation for high-density AV-over-IP systems.