EstiNet

RT188T / 166P

Edge (PoE) Switch

RT188T is an innovative SDN/Legacy hybrid mode switch, which is capable of running Layer-2 protocols for network backward compatibility, and the same time, provides next-generation SDN functions to the network. By collaborating with EstiNet IoT Network Controller, RT188T can provide efficient SDN networking management functions and dynamic resource adjustment functions to the network, which makes it suitable for those networks that require efficient management tools and flexible resource re-assignment in short time, e.g., IoT networks and smart city infrastructure networks.

RT188T is equipped with 24 gigabit RJ45 ports and 4 SFP uplink ports, supports with 56Gbps forwarding capability.

RT166P is an innovative SDN edge POE switch for efficient IoT device networking. By collaborating with EstiNet IoT Network Controller, RT166P can serve as a power supplier for IoT devices, while, at the same time, providing a highly efficient SDN network for device networking management. RT166P is equipped with 8 gigabit RJ45 ports and 2 SFP uplink ports support with 20Gbps forwarding capability. Each RJ45 port of RT166P can provide up to 30-Watt power for a connected device.

Key Features and Benefits

Performance and Extensibility

RT188T/166P are high-performance gigabit web smart switches that integrates OVS OpenFlow agent. RT188T 56Gbps and RT166P 20Gbps switching capacity can deliver wire-speed performance on all ports. The OpenFlow agent can connect to an IoT Network Controller to enable a variety of flow-based SDN applications.

Rich L2 Features

RT188T/166P support complete L2 features, including Flow Control, STP/RSTP/MSTP, 802.1Q tag VLAN, 802.1v protocol-based VLAN, dynamic/static Link Aggregation and Multicast support. With the Multicast support, the switch provides the IGMP snooping and MLD snooping to ensure that the switch intelligently forwards the multicast frames only to the appropriate multicast frame subscribers.

SDN

RT188T/166P enable the state-of-the-art SDN functions for network administrators. By collaborating with EstiNet's IoT Network Controller and applications, RT188T/166P can perform fine-grained, flow-based network management functions, such as switch configuration auto-provisioning, dynamic flow-based network traffic monitoring, and abnormal traffic detection/rejection.

Useful Security

RT188T/166P provide a variety of advanced security features to safeguard your network. These security protection functions include 802.1X, RADIUS/TACACS+, HTTPS, SSL, Port Security, Storm Control, Denial-of-Service(DOS) Prevention, Dynamic ARP Inspection, IP Source Guard, etc.

Powerful Access Control List

With the powerful ACL utility, administrator can restrict sensitive portions of the network from unauthorized users and guard against network attacks. RT188T/166P support MAC-based ACL, IPV4-based ACL and IPV6-based ACL.

Power Saving

With built-in IEEE802.3az Energy Efficient Ethernet (EEE) feature and more innovative green feature, RT188T/166P can reduce energy consumption through many smart automatic detection, such as Link Down Power Saving, Cable Length Power Saving, No traffic or Small traffic Power Saving.

Advanced QoS

By collaborating with EstiNet's IoT Network Controller and application, the network administrators can designate the priority of streaming services based on different QoS requirements. RT188T/166P prioritize delay-sensitive services such as voice and video streamings. It provides different classes of services, including flow-based.

RT166P(8P,PoE)

RT188T(28P)

OpenFlow Features

Software Specifications

- OpenFlow Specification: v1.3
- Open vSwitch: v2.1.2
- OVSDB

OpenFlow Channel

- Controller To Switch
  - Features
  - Configuration
  - Modify State
  - Read State
  - Packet Out
  - Barrier
  - Role Request
  - Asynchronous Configuration
- Asynchronous
  - Packet In
  - Flow Removed
  - Port Status
  - Error
- Symmetric
  - Hello
  - Echo
  - Experimenter

Statistics

- Per Flow
  - Receive Bytes
  - Duration
- Per Port
  - Receive Packets/Transmit Packets Receive Bytes/Transmit Bytes Receive Drops
  - Receive Error/Transmit Error Collisions
  - Duration
  - Receive Frame Alignment Errors Receive CRC Errors

Switch Capability

- Hybrid mode support:
  - Legacy
  - Legacy + SDN OpenFlow

SDN Controller Support

- OpenDaylight (ODL)
- RYU
- Floodlight

Performance

- Flow Table: 1K
- Meter Table Entry Count: 150 (or higher)
- Counter Entry Count: 90 (or higher)

Actions

- Output
- Drop
- Set IP DSCP
- Set VLAN VID/PCP

Instruction

- Meter (Switch IC Based)
- Apply-actions

Matching Field/Combination

Seven combinations for commonly-used L2, L3, and L4 fields listed below: (Please refer to the User Manual for detailed information.)

- Ingress Port
- Physical Port
- MAC SA/DA
- Ether type
- VLAN ID/PCP
- IPv4 SA/DA
- IPv4 DSCP
- IPv4 ECN
- IPv4 Protocol
- TCP Source Port
- TCP Destination Port
- UDP Source Port
- UDP Destination Port
- ICMP type
- ICMP code
- ARP op code

OVSDB Monitoring

- OpenFlow Controller Link Status
- Link Up/Down Event of Each Link

Product Specifications

Physical Information

- RT188T
  - Dimension: 441 x 131 x 44mm
  - 24*10/100/1000 Mbps RJ-45; 4*1000 Mbps SFP
  - RS-232
  - Fanless
- RT166P
  - Dimension: 266 x 185 x 44mm
  - 8*10/100/1000 Mbps RJ-45; 2*1000 Mbps SFP
  - LEDs: 1*Power/1*System/8*Port/Link/ACT, PoE
  - Fanless
- Power Supply：100-240 VAC, 50/60HZ
- Operating Humidity：10% to 90%
- Operating Temperature：0℃to 40℃

Performance

- MAC Address Table: 8K
- Jumbo Frame: 10K Bytes
- Switching Capability: 56Gbps (RT188T)
- Switching Capability: 20Gbps (RT166P)

Layer 2

- Flow Control
  - 802.3x for full-duplex mode
  - Back-Pressure for half-duplex mode
- Spanning Tree Protocol
  - 802.1D Spanning Tree Protocol (STP)
  - 802.1w Rapid Spanning Tree Protocol (RSTP)
  - 802.1s Multiple Spanning Tree Protocol (MSTP)
  - BPDU Guard
- VLAN
  - Port-based
  - MAC-based
  - Protocol-based
  - IP Subnet-based
  - Management VLAN
  - GVRP
  - Voice VLAN
- MVR (Multicast VLAN Registration)
- Link Aggregation
  - Static Trunk
  - 802.3ad Link Aggregation Control Protocol (LACP)
  - Trunk Groups: 8
  - Maximum number of members per group: 8
- Storm Control
  - Broadcast
  - Unknown Multicast
  - Unknown Unicast
- Multicast
  - IGMP v1/v2/v3 Snooping
  - MLD v1/v2 Snooping
  - IGMP/MLD Snooping Filtering
  - IGMP/MLD Snooping Throttling
  - IGMP/MLD Snooping Immediate Leave
  - IGMP Snooping Querier

IPv6

- IPv4/IPv6 Dual Protocol Stack
- Auto Configuration
- IPv6 Neighbor Discovery
- ICMPv6
- SNMP over IPv6
- HTTP/HTTPS over IPv6
- TFTP over IPv6
- Ping over IPv6
- DHCPv6

QoS

- Class of Service
  - 802.1p-based COS
  - IP DSCP-based COS
  - HW Queues: 8 queues/per port
  - DiffServ
- Priority Queue Scheduling
  - WRR priority scheduling
  - Strict priority scheduling
  - Hybrid (WRR + Strict)
- Rate Limiting
  - Port-based
  - Flow-based

Network Discovery

- LLDP (802.1ab)
  - LLDP
  - LLDP-MED

Power Saving

- 802.3az
- Cable Length Detection
- No Link Power Saving

Security

- Access Control List
  - MAC-based
  - IPv4-based
  - IPv6-based
  - Management ACL
- Port Security
  - Static Configuration
  - Dynamic Learn
- IEEE 802.1X
  - Port-based
  - Guest VLAN
- Local Account Management
- Web-based Authentication
- MAC-based Authentication
- RADIUS/TACACS+
- SSL v2/v3, TLSv1
- SSH v1/v2
- HTTPS
- BDPU Guard
- CPU Defense Engine
- Denial of Service (DoS) Prevention
- DHCP Snooping with Option 82
- Dynamic ARP Inspection (DAI)
- Protected Port

Management

- Web-based GUI
- Firmware Download/Upgrade
  - TFTP
  - HTTP
- Configuration Upload/Download
  - TFTP
  - HTTP
- DHCP
  - Client
  - Snooping
- RMON groups 1, 2, 3 and 9
- SNMP
  - v1/v2/v3
  - Traps
- Multiple Configurations
- UDLD
- Management Access Filtering
  - SNMP
  - Web
- Timing Protocol
  - SNTP
- Account Manager
  - Local Authentication
  - Multiple User Account
  - Password Recovery
- Port Mirroring
- Cable Test

PoE (RT166P Only)

- IEEE 802.3af/at (PoE+)
- Provide up to 30W for connecting device
- Total PoE Budget 120W

Ordering Information

- RT188T-ENT: 24-port 1GbE RJ45, plus 4x1 GbE SFP uplink ports. Enterprise version software.
- RT166P-ENT: 8-port 1GbE RJ45, plus 2x1 GbE SFP uplink ports. PoE Switch. Enterprise version software.

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