EstiNet

IoT Network Solution

Next-Generation Automated Network Solution

As the Internet-of-Things (IoT) era comes, the needs of Machine-to-Machine (M2M) communication greatly arises accordingly. New IoT applications are expected to be developed based on such M2M networks. New technologies such as Big Data analysis and Artificial Intelligence (AI) are also expected to drive these applications into next stages with the power of data science. As an important IoT system infrastructure, abundant M2M connectivity could generate new impacts to the networking system, such as:

- management/control of the networking of many IoT sites
- management of large numbers of heterogeneous IoT devices
- Varied network quality needs with dynamic flexibility
- Security issues on IoT devices

To fulfill the aforementioned requirements in the IoT worlds, EstiNet provides the IoT Network Solution to simplify the management process of IoT networks. The core of the IoT Network Solution is the EstiNet IoT Network Controller, which is responsible for controlling EstiNet Edge switch and EstiNet IoT Access Point (AP), to provide a commercial-grade, highly-reliable IoT Network platform. Over our IoT Network platform, network administrators can control and manage network devices in a policy-based manner. Compared with traditional networks, which usually requires network administrators to set up devices one-by-one, EstiNet's IoT Network platform allows them to set up the network with fewest policy-making steps for automatic network operation. In addition, based on real-time needs of IoT devices, EstiNet IoT Network platform is capable of dynamically adjusting network resource assignment in real time. This provides high-quality, reliable, and extensible networking systems for large-scale IoT networks, which demands efficient ways to network management and dynamic resource adjustment.

Remarkable Features

One-Portal Dashboard
Unified, intuitive, easy-to-use network control portal

Unified Dashboard

EstiNet One-Portal integrates all network management functions into a highly-integrated web-based control panel.

Network Visualization

One-Portal provides visual views of the whole network for responsive and intuitive network health monitoring, e.g., link connectivity, device and host health, routing paths between hosts. Topology detection and device status checking can be done automatically without the need of installing any plugins into devices.

Central WiFi AP Control
The Central WiFi AP Control module is highly integrated with IoT Network Controller One-Portal dashboard, which provides efficient and convenient central control interface for managed WiFi APs. The module provides the following functions:

- Status monitor of WiFi AP devices and WiFi stations on integrated One-Portal panel
- Central SSID assignment and setup
- Channel and transmit power automatic setup (manual modifications from the One-Portal panel is allowed.)

NFV Pilot Platform
The NFV Pilot module provides the Network Function Virtualization capability for the IoT Network Controller. VNFs (Virtual Network Functions) are allowed to be run on the IoT Network Controller platform in a container-based virtual form. Common network functions such as virtual DHCP server, virtual DHCP relay, and virtual Radius server, are now integrated into the IoT Network Controller to provide quick network deployment for IoT network administrators.

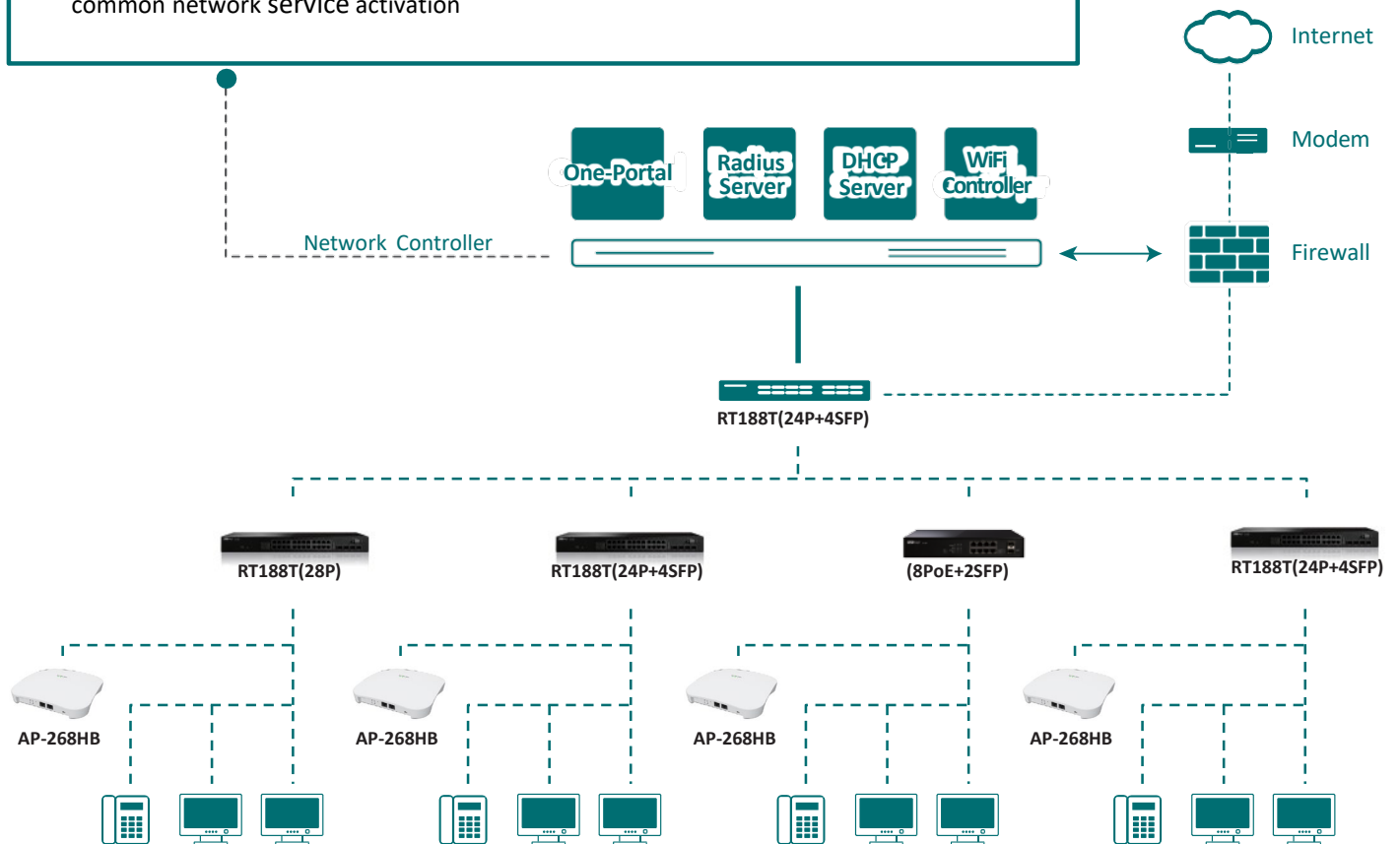### L2 Backward Compatibility and High Reliability
EstiNet IoT Network Solution adopts a legacy + SDN hybrid operation mode, which is backward-compatible with traditional Layer-2 networks and, meanwhile, provides new powerful SDN functions to achieve high efficiency. The network can be switched back to the traditional mode, if the Network controller is offline. Thus, the network reliability and connectivity can be guaranteed.

Solution Architecture
(Network Controller + Edge Switch + AP)

EstiNet Network Controller

- ◆ Provided unified one-portal interface for Edge Switches and APs
- ◆ Provide Policy-based management for automatic networking operation
- ◆ Provide highly-integrated container-based Virtual Network Functions (VNFs) to ease common network service activation

Internet

One-Portal | Radius Server | DHCP Server | WiFi Controller

Network Controller

Modem

Firewall

RT188T(24P+4SFP)

RT188T(28P)　　RT188T(24P+4SFP)　　(8PoE+2SFP)　　RT188T(24P+4SFP)

AP-268HB　　　　AP-268HB　　　　　AP-268HB　　　　　AP-268HB

Edge Switch (RT188T/RT166P)

- ◆ Provide High-reliability and backward-compatible Legacy/SDN hybrid mode
- ◆ Support state-of-the-art OpenFlow protocol
- ◆ Support OpenFlow hardware meters/counters
- ◆ Support L2 STP/RSTP protocols
- ◆ Support Power-Over-Ethernet (POE) functions (RT166P only)

AP (AP268HB)

- ◆ Support IEEE 802.11 a/b/g/n/ac
- ◆ Support POE
- ◆ Support remote One-Portal management from the IoT Network Controller
- ◆ Provide remote setting for output power, channel, SSIDs
- ◆ Support multiple virtual access points feature (up to 32 SSIDs)
- ◆ Support remote firmware upgrade

Product Specification

Network Controller Solution Package (Network Controller + Network Controller Apps)	
Basic Version (Model No.: INC-1800)	
Major Feature	**Description**
Automatic Network Setting Provisioning — VLAN Auto-setup	IoT Network Controller can automatically set up VLANs of a switch port after device VLAN profiles are registered. When a device is moved to another port, the VLAN setting of a port will be automatically recalculated and set up by IoT Network Controller.
Device Auto-detection and provision	Automatically detect the connection switch port of the connected device and apply its settings to the corresponding switches
IP and port settings auto-provision	Support DHCP server to assign IP address, MAC/IP address binding and IP port binding automatically
Intelligent Diagnosis — Network Status Monitoring	Network response delay and packet loss rate monitoring
Abnormal Diagnosis	Internet device transmission traffic or status abnormal monitoring
IP Address conflict Detection	Automatically detect the connection location of IP conflict related devices
Disconnect warning	Automatically detect switch and port status and issue a warning when disconnected
DHCP Snooping	IoT Network Controller can drop DHCP messages issued by unregistered DHCP servers at edge switches, protecting network operation.
Security Management — Device Authentication	Support black/ while list and online device audit mechanism
IP & Port Binding	Support IP address and port binding
Traffic Control — Traffic Statistics	Real time switch port TX / RX traffic and historical data query
Bandwidth Utilization	Automatically detect network topology and analyze bandwidth rate
Bandwidth Reservation and Slicing	The system can automatically set the point-to-point bandwidth reservation, and dynamically set the internal/external bandwidth guarantee according to the network status.
Rate Limiting	Limit the bandwidth threshold of Internet devices to ensure the bandwidth of other devices

Network Controller management functions

OpenFlow

- Support OpenFlow 1.3
- Support In-Band Control
- Support Hybrid Mode

Topology management

- Automatically detect & display the Switch topology
- Display Topology by VLAN
- Display switch bandwidth usage
- Display the path between communication pair
- Display the map topology

Switch management

- Support OpenFlow switch and Legacy switch management
- Support IEEE 802.1Q VLAN Tagging
- VLAN setting auto provision
- Support Mac-Based VLAN
- Support switch port statistics display
- Support group of switches setting
- Support switch firmware upgrade
- Support switch configuration update
- Support Tag management

Device Management

- Support users and group settings
- Support MAC/IP address and VLAN auto detection
- Support connecting switch port auto detection
- Support the device setting could be auto provision
- Support a large number of equipment import & export

System

- Configuration Profile export or import
- Display system CPU and memory usage
- Event log classification display

Security

- Support unknown device access detection
- Internet device audit
- Support whitelist (pick one of whitelist and blacklist)
- Support blacklist (pick one of whitelist and blacklist)
- Support DHCP Snooping
- Support MAC and IP binding
- Support IP and connection port binding
- Support IP address conflict detection

Bandwidth Management

- Support host rate limit
- Support Internal subnet traffic limitation
- Support upload and download internet bandwidth and reservation
- Support internet and internal subnet traffic slicing

Intelligent Diagnosis

- Network response delay monitoring
- Packet loss rate monitoring
- IP address connection monitoring
- Device abnormal diagnosis of data transmission behavior
- Device health diagnosis

Abnormal Monitoring

- E-mail warning notice
- Abnormal port traffic warning
- Abnormal port disconnection warning
- Abnormal switch disconnection warning

NFV

- Built-in DHCP server
- Built-in Radius server