Network Efficiency Optimization
Solution for Data Center

EstiNet Cloud SDN Solution
Cloud SDN Controller + MT198T Cloud Switch

- Automatic Network Path Optimization
- Automatic Fast Failover Setup and Recovery
- Visualized Graphical Problem Diagnosis

Major Function Specifications

**Truly control on physical network switches for resource optimization**

**Higher quality and higher performance**

With dynamic path planning, EstiNet Cloud SDN Controller can plan the best paths for each virtual hosts, distributing the traffic over all available paths in the physical network, so as to enhance the effective network utilization to several times, compared legacy STP.

**Support efficient cross-regional virtual network**

(Cloud SDN Controller 2.0 or later)
Cloud SDN controller supports both VLAN and VxLAN virtual tunnel architecture.

**Traffic Management and Network Slicing (Cloud SDN Controller 2.0 or later)**

**Controllable traffic management**
Network access rules be applied based on MAC address or IP address to ensure that the all network access bandwidth are legal.

**Support network slicing**
Network bandwidth can be sliced based on IP address pairs or Layer-4 port pair rules, ensuring each application’s varied bandwidth needs and patterns can be well served.

**Inter-operable with OpenStack**
(Cloud SDN Controller 2.0 or later)
Current EstiNet Cloud SDN Controller is a stand-alone controller that optimizes networked devices without the need of installing any plug-ins into Cloud Systems. Future enhancement would include OpenStack plug-in and OVS integration for detailed tenant management.

**Automatic fast failover mechanism**

**Automatic setup**
Unlike in traditional network, where administrator needs to setup port trunk protocols (e.g., static trunk or LACP) and virtual chassis aggregation protocol (e.g., MC-LAG) to maintain logic backup mechanism, in EstiNet SDN solution, the spine switch backup is automatically detected and setup by the SDN Controller, greatly saving the setup and maintenance time.

**Automatic recovery mechanism**
The Cloud SDN controller pre-prepares alternative paths for breakage of the network lines, so as soon as a physical link fails, it quickly replaces the failed path with one next healthy alternate path in less than 1 second, compared with STP, which would take 30 seconds to repair the network.

**Support Controller high-availability (HA)**

**Deployment** (Cloud SDN Controller 2.0 or later)
EstiNet SDN Controller support pairwise HA architecture (two-node HA) to achieve high reliability operation.

**Data Center Network visibility and Visual Diagnosis for Network Problems**

**Path visibility**
EstiNet Cloud SDN Controller visualizes the topology and all network paths in a data center to help managers quickly understand the status and usage of network paths.

**Flow visibility**
The Cloud SDN Controller has a graphical interface that allows managers to see the flow of physical switches, ports, links, virtual networks, and virtual machines (VMs) or two communications hosts in layer-displayed mode, which help to quickly find out network issues in a data center.
MT198T SDN Cloud Switch
- 48*10G SFP+ ports and 6*40G QSFP ports
- Nephos Aries series switch chips and Intel CPU
- 720Gbps Switch Fabric Capability
- Support Legacy network Operating mode:
  - Support L2 STP/RSTP communication Protocol
  - Support L3 OSPF/ISIS Routing Protocol
  - Support LACP/MCLAG/LLDP Protocol
  - Support SDN OpenFlow Operating mode:
    - Support OpenFlow 1.3 Protocol
    - Support OpenFlow MAC Address Table entries up to 192K
    - Support Multiple Flow Table: Max. 6 stage pipelines, 4 tables per stage
    - Support OpenFlow hardware meter and counter

Cloud SDN Controller
- Provide Data Center per-POD network management and monitoring
- Provide intuitive graphical management dashboard
- Provide two Controller High Availability backup mechanism
- Interoperate with VLAN, VxLAN, GRE Tunnel modes
- Support OpenFlow 1.3 Protocol
- Optimize efficiency of Cloud overlay networks
- Support data flow bandwidth statistic and rate-limit

Stateful Active Backup

Cloud SDN Instance1  Cloud SDN Instance2  Cloud SDN Instance3

MT198T SDN Cloud Switch Diagram

Internet Diagram

Cloud SDN Controller Diagram
Cloud SDN Controller

- Dynamic load balancing
- High availability
  - Switch Fail automatic recovery
  - Link Fail automatic recovery
  - Controller HA
- VLAN automatically setting

- Equipment automatic detection
- Flow Statistic
  - Switch/Port/IP address
- Link utilization Display
  - Switch device traffic statistics
  - Hosting information

Spine-Leaf Architecture

Topology Detection

Fast Failover

Switch Traffic Monitor

Port Traffic Statistic

Virtual Machine Information
# Function Specification List

## EstiNet Cloud Solution (Cloud SDN Controller)

<table>
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<th>The Major Functions</th>
<th>Functional Description</th>
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<td><strong>Network Topology Auto-detection</strong></td>
<td>The controller supports the OpenFlow protocol and automatically detects the network topology to display the network topology, switch traffic load, link bandwidth utilization</td>
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| **Dynamic Path Planning**                | **Support dynamic network traffic balance**  
When multiple paths are available, the controller automatically selects the lower-traffic path based on the network status. Compared with STP, the overall performance can be increased many times, greatly increasing the flow of traffic on the network.  
Support Active-Active Link Backup in SDN Mode  
Physical network links are automatically grouped for backup each other, which utilizes the state-of-the-art SDN operation to achieve active-active backup and dynamic load balancing |
| **Automatic Fast Failover Setup and Recovery Mechanism** | The controller automatically detects the switch failure and link failure, in the event of a disconnection, replace the failed path quickly with an alternative path. STP takes 30 seconds to fix the network, however the Cloud SDN Controller software can perform the backup path setting within 1 second |
| **VLAN Auto-Provision**                  | Automatically detecting the VLAN used by the server side via inspecting passing-through packets and automatically configuring VLAN settings of each physical switch for the whole network |
| **Network Bandwidth Management**         | Support bandwidth management and network access control management                                                                                                                                                    |
| **Visualized graphics problem diagnosis**| **Intuitive way to explore the network problem**  
Multi-level traffic presents physical network, virtual network, and VM-level traffic, quickly find the congestion path, according to modify the network configuration. |
| **Network congestion path display**      | Real-time display of network congestion level in different colors                                                                                                                                                    |
| **Cloud System Interoperability**        | Interoperable with OpenStack (and other Cloud Systems which uses VLAN and L2 for physical network provisioning)                                                                                             |

## Hardware Specifications Requirements

- **Processor**: 16x Intel(R) Xeon(R) CPU E5540 @ 2.53GHz above
- **Memory**: Above 16GB
- **Hard Disk**: 2TB 7200 RPM 64MB Cache SATA 6.0Gb/s

## Ordering Information

- **Cloud SDN Controller**: CSC-0001: Cloud SDN Controller
- **MT198T Cloud Switch**: MT198T-ENT: 48-port 10GbE SFP+, plus 6x1 40GbE QSFP uplink ports. Enterprise version software.