## Product Overview

V350 is both a cost effective high performance switch for SDN/Openflow applications and more importantly a complete open SDN platform. Centec provides a complete turnkey solution from switching silicon to standard productized hardware platform as well as system level software to help SDN vendors to shorten their time to market and reduce development cost. The openness of the V350 platform enables further customization and differentiation which is critical for SDN vendors to compete against other vendors.

Leveraging Centec's third generation high performance Ethernet switching silicon CTC5163, the solution provides 176Gbps (48x1GE + 4x10GE) or 240Gpbs (8x1GE + 12x10GE) forwarding capability with abundant OpenFlow features.

The V350 Series Switches (Figure 1) currently includes three configurations: V350-48T4X/V350-8TS12X.

Centec V350 wins the SDN Idol@ONS award in ONS 2013.



**Figure 1  Centec V350 Open SDN Platform**

## Technical Highlights

- Total 176G/240G forwarding capacity
- Very low system power consumption. Max power consumption for V350-48T4X is 65W, *V350-8TS12X is 47W*
- Support N-Flow**TM** SDN innovation
- Support OpenFlow specification 1.3.x
- OpenvSwitch is integrated
- Multiple flow tables

- Support up to 2K wildcard match flows with complete match field and stats
- Support L2 to L4 complete matching fields
- Support per flow multiple actions
- Support L2 over GRE and MPLS L2 VPN
- Support QinQ, Meter, Queue and Group
- Scenario-fit flow table capability
- Debian system

## OpenFlow Features

### Matching Field

- Metadata
- Physical information
  - Incoming Port
- Layer2 information
  - MAC SA/DA
  - VLAN ID/ VLAN PCP, Ether Type
- Layer3 & Layer4 information
  - ARP operation, ARP SPA/TPA
  - ICMP type/ICMP code
  - IP SA/DA and IP ToS, L3 Protocol
  - TCP/UDP Source Port Number
  - TCP/UDP Destination Port Number
  - GRE tunnel ID
- MPLS field
  - MPLS label

### Instructions

- Meter
- Apply-actions, Write-actions, Write-Metadata

### Actions

- Forward
  - All
  - CONTROLLER
  - IN_PORT
- Modify-field
  - Set VLAN ID
  - GRE tunnel ID

- ➢ Modify source/destination MAC address
- ➢ Modify IPv4 destination address
- ➢ Decrease IP TTL
- ➢ Modify TCP or UDP destination port
- ➢ Set MPLS Label/TC/TTL
- ● Push-Tag/Pop-Tag
  - ➢ Push/Pop MPLS Label
  - ➢ Push/Pop VLAN Tag
- ● L2 over GRE
- ● MPLS L2VPN
- ● Group(indirect, all, select, fail-over)
- ● Set-queue

## Management

- ● Controller
  - ➢ Capable to Configure/Delete/Reset the controller linked to the switch
  - ➢ Multiple controllers
- ● Support SNMP
- ● User privilege

## Statistics

- ● Per Flow
  - ➢ Received Packets/Bytes
  - ➢ Duration (Seconds & Nanoseconds)
- ● Per Port
  - ➢ Rx/Tx Packets/Bytes, Rx/Tx errors
  - ➢ Rx Frame Alignment Errors
  - ➢ Rx Overrun/CRC Errors
  - ➢ Collisions
- ● Per meter
  - ➢ Duration (Seconds & Nanoseconds)
  - ➢ Flow count
  - ➢ Packets/Bytes of each meter
  - ➢ Packets/Bytes of each meter band
- ● Per Group
  - ➢ Reference count
  - ➢ Packet/Bytes of each group
  - ➢ Duration (Seconds & Nanoseconds)

- ➢ Bucket (Packet/Bytes of each bucket)

**Software Specifications**

- ● OpenFlow Spec: v1.3.x
- ● Open vSwitch: master branch
- ● Linux Kernel: 3.8.13

# Ordering Information

| Product Number | Description |
|---|---|
| **V350-48T4X** | • 48x10/100/1000 Base-T RJ45 port<br>• 4x10GE SFP+ port<br>• Centec OpenFlow software |
| **V350-8TS12X** | • 8x10/100/1000 Base-T RJ45 ports, 8x1000 Base-X SFP ports (Combo)<br>• 12x10GE SFP+ ports<br>• Centec OpenFlow software |

# Example Applications

Centec V350 OpenFlow switch provides industry leading L2 over GRE and MPLS tunnel gateway features to accelerating the network virtualization application. The cloud infrastructure can offload the tunnel gateway operation from server to ToR switch with high performance and low cost.
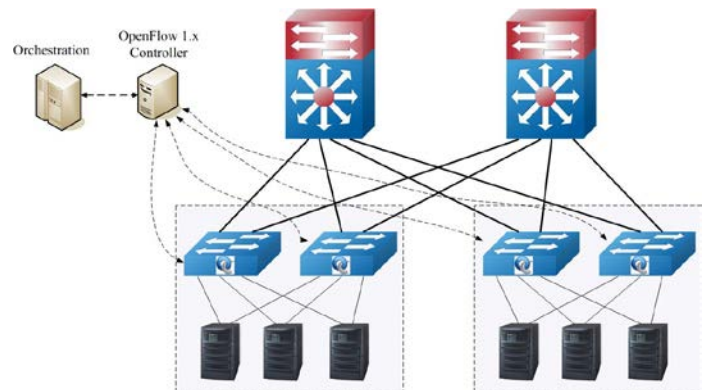


**Figure 2:** Hardware acceleration for network virtualization

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