

# Ensemble Connector

High-performance edge cloud networking and hosting

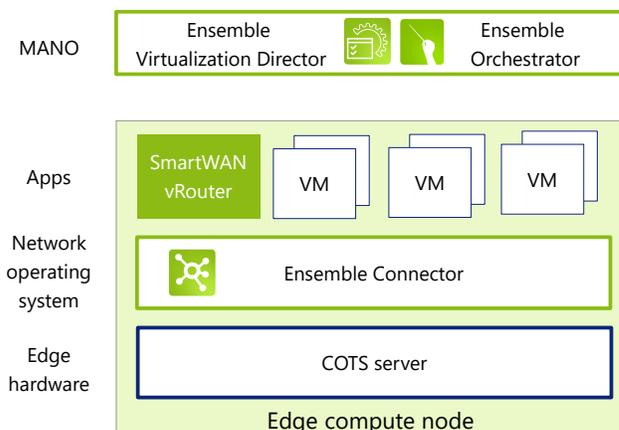
## Benefits

- **No hardware vendor lock-in**  
Choose your own third-party hardware, from low-cost Intel Atom®-based devices all the way up to multi-socket Intel® Xeon® blade servers
- **No orchestration vendor lock-in**  
Connector embedded cloud places a self-contained cloud instance on the compute node, providing an open, standard interface with third-party orchestration platforms
- **Superior virtual switching**  
Fast and efficient and consistent DPDK-enabled switching at Layer 2 and Layer 3. Multi-queue virtio support to enable maximum VNF throughput performance. Native support for Ethernet and wireless interfaces
- **Zero-touch provisioning (ZTP)**  
With Ensemble Connector, CSPs, MSPs or enterprises can ship an unconfigured server to a customer site and then provision it securely without the need for an onsite technician
- **Networking accelerations**  
Ensemble Connector provides a variety of advanced networking options, including SmartWAN encrypted VPNs, SR-IOV, and PCI passthrough Intel®, delivering access from applications to Quick Assist technology (Intel® QAT), graphical processing units (GPU) and many other hardware accelerations
- **Sophisticated management**  
Built-in monitoring features provide insight into the performance of the platform, hosted applications and communications network.
- **Advanced resilience**  
The Ensemble system provides for backup of configuration to accelerate disaster recovery and minimize downtime
- **Security and encryption**  
Connector offers protection at multiple levels: commissioning, virtualization, management, user connections and user data

## Overview

Communications service providers (CSPs), managed service providers (MSPs) and enterprises know that supporting applications at the network edge is key to enabling service revenue growth and operational agility. The challenge is to provide an open and powerful platform that can host bare metal application, cloud native functions (CNFs) and virtual network functions (VNFs) across various deployment configurations.

CSPs, MSPs and enterprises are looking to diversify their vendor ecosystem and offer value-added services, all while maintaining ease of deployment and management of their end-customer solutions. To deliver on this requirement, they need a solution that scales from small to larger applications and which supports a variety of networking models. They need an enablement platform that provides high-throughput data path performance and flexible hosting; one that solves their OpenStack operational concerns and makes OpenStack easily deployable outside of the data center. Moreover, they need a solution that operates on a wide range of commercial off-the-shelf (COTS) platforms, protecting their software investment and unlocking the networking functions from proprietary hardware. What CSPs, MSPs and enterprises need is Ensemble Connector. With Ensemble Connector, they can provide virtual networking and application hosting functionality at the customer premises and telco edge.



# ENSEMBLE CONNECTOR

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## High-level technical specifications

### Network services

- Virtual routing and forwarding (VRFs)
- MEF CE 2.0 compliant E-Line, E-LAN, E-Tree services
- Network address translation (NAT)
- Port address translation (PAT)
- Innovative IP passthrough
- DHCP client and DHCP server

### Protocols

- Border gateway protocol (BGP)
- L2/L3 VPN on MPLS
- 802.3ah link OAM
- Y.1731 SOAM
- 802.1ax link aggregation
- RFC 2473 IPv6 encapsulation
- REST, CLI SNMP, and HTTPS

### Data path

- DPDK acceleration libraries and drivers, plus SR-IOV and PCI passthrough
- Eight class of service queues
- Policing and priority rate profiles
- Packet capture
- Ingress matching rules on L2/L3 criteria

### Cloud services

- OpenStack embedded cloud with full compute and controller services and APIs: Glance, Swift, Keystone, Nova, etc.
- KVM/QEMU hypervisor environment
- Local orchestration through OpenStack Horizon GUI

### Zero-touch provisioning

Flexible ZTP tool set with:

- Secure tunnel interop with third-party security gateways
- Auto port detection
- Two-factor authentication
- VLAN-based search algorithms
- Customer splash screens
- Software upgrade / reversion

### Security and encryption

- TACACS+, RADIUS authentication
- IPSec with IKEv2 tunneling
- AES encryption (256bit)
- Flexible data encryption at Layers 2, 3 or 4 with optional use of Intel® QuickAssist Technology (Intel® QAT)
- SSH key-based login options
- Role-based access (RBAC)
- Auto-lockout

