

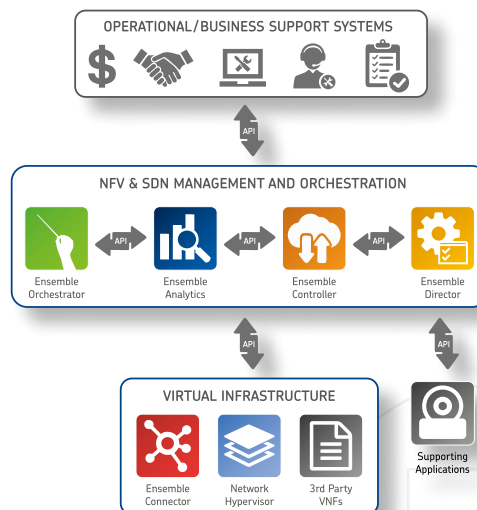


Ensemble Connector

High-performance network virtualization platform

Communications service providers (CSPs) know that virtualizing their network is key to enabling service revenue growth and operational agility. The challenge for the CSP is to provide a ubiquitous virtual switching infrastructure that can host other virtual network functions (VNFs).

CSPs virtualizing their network need an enabling platform that provides high-throughput data path performance. They need a solution that scales from small-footprint, edge applications to high-density, data center use cases. They need a solution that solves their OpenStack operational concerns and makes OpenStack fully deployable outside of the data center. And they need a solution that operates on a wide range of commercial off-the-shelf platforms, protecting their software investment and unlocking the networking functions from proprietary hardware. They need Ensemble Connector. Ensemble Connector is a family of software packages that enables CSPs to provide the data path and virtual hosting functionality at customer premises, in the gateway between network clouds, and in the data center.



Your benefits

- ✓ **IP and Ethernet forwarding**
Layer 2 and Layer 3 forwarding models with rich traffic classification enabling deployment anywhere
- ✓ **Virtual hosting environment**
VNFs operate under KVM/QEMU for easy, open orchestration integration
- ✓ **Encapsulations and VPNs**
Layer 3 VPN that interoperates with embedded networks and IPsec tunnels for overlay use cases
- ✓ **API services**
YANG model NETCONF and RESTFUL API services simplifying integration with third party OSS/BSS systems and our control and orchestration
- ✓ **Embedded cloud packages**
Local OpenStack controller ensuring OpenStack scalability, performance and manageability
- ✓ **Two-factor authentication and call home**
Support for secure authentication and zero touch commissioning of new turn-ups

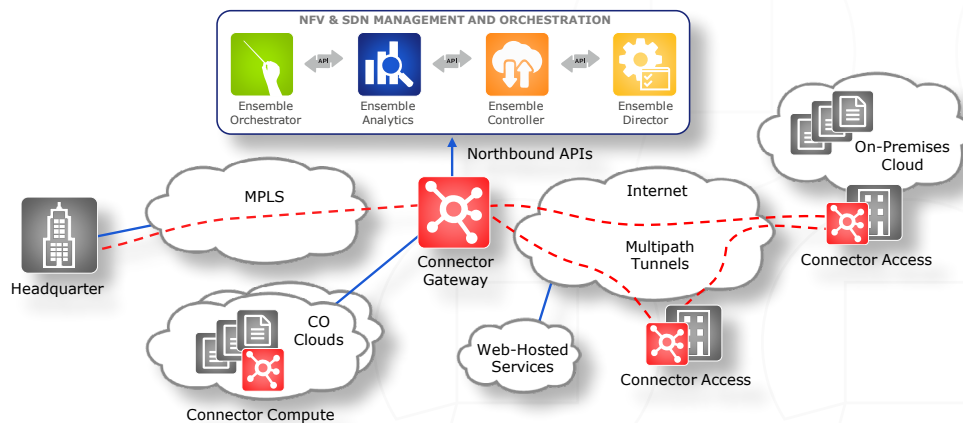
High-level specifications

Services	Management/security	Protocols
<ul style="list-style-type: none"> • MEF CE 2.0 compliant services • Virtual routing and forwarding • Generic routing encapsulation • IPsec secure transport • BGP for Layer 3 VPNs and IP 	<ul style="list-style-type: none"> • YANG / NETCONF and REST APIs • Command line interface (CLI) • SNMP event reporting • OpenStack service APIs • Radius, TACACS+ 	<ul style="list-style-type: none"> • Link loss forwarding (LLF) • Link OAM based on 802.3ah • Service OAM based on Y.1731 • Link aggregation based on 802.1AX • eBGP / iBGP with security
Cloud services	Traffic management	Zero touch
<ul style="list-style-type: none"> • OpenStack Kilo Controller (Glance, Swift, Keystone, Nova, Neutron, ...) • OpenStack Kilo Compute (Nova, Neutron, Ceilometer, Cinder) • KVM / QEMU 	<ul style="list-style-type: none"> • DPDK set of libraries and drivers for fast packet processing • Matching criteria based on inner / outer VID, pbit, 5-tuple header • Egress bandwidth limiting 	<ul style="list-style-type: none"> • Two-factor authentication (2FA) over secure SSL tunnel • Management tunnels over IPsec with encryption • NETCONF call home based on draft-IETF-netconf-call-home

Applications in your network

High-performance network virtualization platform for hosting multi-vendor VNFs

- Encapsulation and routing protocols enable Ensemble Connector to build both overlay networks and VPNs through the legacy underlay network
- Ensemble Connector can establish overlay tunnels on existing IP backbones to tunnel Layer 2 and Layer 3 services with encapsulation
- Ensemble Connector creates a hosting environment and provides the services for connecting VNFs to the network or to other VNFs
- Virtual routing function (VRF) forwarding models support address space overlapping and enable Ensemble Connector support of multi-tenancy use cases



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