OpenStack Networking that Scales!

The next generation of OpenStack Networking has arrived. Enterprises and service providers are no longer constrained by the basic Neutron networking service that comes with OpenStack, which provides only very basic network services, requires manual configuration and has limited scalability. For customers who want production-ready virtual and physical network agility, flexibility and performance, help has arrived!

Dynamic Virtual Networks – Data Center

CPLANE Dynamic Virtual Networks – Data Center (DVNd) delivers high performance Layer 2 and Layer 3 virtual networks that quickly and seamlessly connect hundreds of physical compute nodes and thousands of virtual machines. DVNd eliminates the hassles and limitations associated with legacy network architectures and protocols such as VLANS and Spanning Trees, while providing maximum flexibility and performance in securely isolating and configuring applications and tenants.

Seamless OpenStack Integration

DVNd easily integrates with the OpenStack framework to transparently provide virtual network services. There are no dependencies on any of the embedded OpenStack databases or schemas, so there are no special hooks or configuration files to worry about. DVNd seamlessly handles the standard networking requests from the Nova scheduler and quickly provisions high performance, highly available virtual networks.
DVNi Features

- Network
  - Tenant and network isolation (L2/L3 VXLAN)
  - Unlimited tenants, network and subnets
  - Cross domain (subnet/tenant) routing
  - DHCP, Floating IP, NAT, DDoS protection, QoS
  - Native access services via Overlay Gateway Router (OGR) virtualized network function
  - BGP advertisement for virtual router next hop
  - Seamless overlay extension into MPLS

- Flow optimization
  - Local L3 routing (distributed router)
  - Broadcast elimination (local ARP proxy)
  - No unnecessary multi-hop backhauling

- Compute Node Agent
  - Multiple hypervisor support
  - Zero-touch management
  - Auto restart and reconfiguration of compute nodes
  - Separate NICs for SNAT, data and floating IP
  - NIC bonding
  - SSL for all cross-server communication

- Name Service and Bootstrap
  - Auto registration of OVS with SDN controller
  - Resiliency, failover and load balancing to SDN controller
- Integrated Management Console
  - Complete data coherency with OpenStack Horizon
  - Hierarchical and graphical views
  - ARP table visualization
  - Flow rule (VM-VM) mapping, validation and consistency checking
- Ultra-lightweight OpenStack Controller Node plugin
  - Lightweight Neutron pass-through
  - No dependency on OpenStack schemas and databases
- Automated Installation and Deployment
  - OpenStack Newton/Ocata compatible
  - TripleO, Red Hat Director & JuJu Charms automated provisioning

**Release Support**
- Newton/Ocata support for CentOS 6.6 and RHEL 5/6/7
- Newton/Ocata support for Ubuntu 14.04 TLS
- ML2 support for Newton/Ocata
**Deployment Architecture**

DVNd integrates with OpenStack by completely replacing all of the functions normally provided by the OpenStack Network Node. DVNd handles all Nova service requests for networking by building a complete topology map of the compute nodes, which auto-register with the CPLANE SDN controller when they are initialized. Optimized flow rules are then pushed to only the nodes in the participating subnet via the CPLANE CP Agent, which creates flow tables through standard OVSDB/OVS-CTL requests. All network services (routing, DHCP, Floating IP, NAT, ARP Proxy, etc.) are handled locally, eliminating the need for external routing services. Gateway services are provided by the CPLANE Overlay Gateway Router (OGR), a lightweight virtualized network function.

**CPLANE Networks CP Agent**

- **VM**
- **vSwitch**
- **Routing Flows**
- **L3 Router**
- **Local DHCP**
- **Floating IP**
- **NAT**
- **ARP Proxy**
- **OGR Gateway**
- **ACL/DDoS**

**Management Network**

- **External Network (Floating IP)**
- **VXLAN**
- **Data Network**
- **SDN Controller** (Neutron (API pass-through))
- **OpenStack Controller**
- **OpenStack Network Node**
  - **L3 Router**
  - **Floating IP**
  - **NAT**
  - **DHCP**

**Dynamic Virtual Networks – Data Center – Architecture**
Single Integrated Solution

CPLANE’s Dynamic Virtual Networks – Data Center is a fully-integrated solution that provides complete OpenStack cloud networking from a single platform. When combined with CPLANE’s Multi-Site Manager (MSM) solution, DVNd provides complete software-defined networking for seamless integration within and across cloud pods, data centers and geographically distributed cloud sites.

DVNd leverages the performance and reliability of standard OpenStack distributions for Red Hat (OpenStack Platform 8 certified) and Canonical. MSM utilizes Canonical’s JuJu Charms to provide easy point and click deployment.

About CPLANE.ai

CPLANE.ai orchestrates and manages highly-distributed clouds for Edge Computing, IoT, Industrial IoT, MEC, Fog, and intelligent edge applications. We eliminate the complexity associated with deploying cloud resources to millions of Edge Computing end points, allowing enterprises and service providers to focus on value-added business and IT services.

To learn more about our fully-integrated cloud orchestration and software-defined networking solutions, visit us at: www.cplaneai.com

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