

# Juniper and Canonical Jointly Develop Converged Cloud and NFV Infrastructure

Juniper and Canonical partner to deliver open-source based cloud and NFV solutions

## Challenge

OpenStack is the winning platform for cloud and NFV infrastructures, but optimizing its performance, scale, reliability, and streamlined operations is still complex.

## Solution

Together Canonical, the people behind Ubuntu, and Juniper Networks deliver on the promise of OpenStack and SDN. The integration of Ubuntu OpenStack and Ubuntu Server OS into Contrail Cloud Platform creates a turnkey carrier-class infrastructure for NFV, and the integration of Contrail Networking with Canonical OpenStack pairs best-of-breed open-source SDN and cloud orchestration.

## Benefits

- Eliminate lock-in with future proof open source software
- Proven pre-integrated OpenStack and SDN technologies accelerate and ease deployment
- Increase operational effectiveness and decrease cost of ownership with fully integrated management and automated workflows



Supported by Canonical

OpenStack has quickly become the obvious choice to build infrastructure as a service (IaaS) platforms for hybrid and private cloud solutions, as well as carrier NFV solutions.

The benefit of Canonical and Juniper's adoption of the open source software paradigm and a technology alliance partnership make it easy to choose products in building open cloud solutions free of lock-in without having to take a do-it-yourself stance. Ubuntu, supported by Canonical, simplifies building open elastic and extremely optimized cloud infrastructures. Juniper does the same with SDN and cloud network automation, enabling secure and scalable multi-tenancy by abstracting tenant networks and allowing tenants to manage their networks based on APIs and telemetry of application conditions.

Moving to an open architecture frees cloud builders from costly and proprietary technologies of the past and future. Today, that OpenStack architecture is available as a carrier-class turnkey solution with the simplicity of unified product support.

## The Challenge

Today's large organizations and service providers need to be able to efficiently provide secure, high-performance, SLA-compliant cloud services and virtualized network functions to multiple tenants across multiple locations and hybrid cloud topologies. At the same time, they want to make best practical use of existing equipment to avoid rip-and-replace expenditures. While SDN is a novel approach to networking and puts significant sophistication into software, SDN deployment for the cloud should not need to be challenging nor require any upgrade of the physical network. Similarly embracing open source software, should provide lower cost and flexibility of choice without forcing the operator to assemble, test, and optimize all the pieces.

## Converged Cloud and NFV Infrastructure Solutions

### The Best of Both Open-Source Worlds

The Juniper Networks® and Canonical partnership began with Juniper and the [OpenContrail](#) project participating in Canonical's OpenStack Interoperability Lab (OIL), an integration lab in which Canonical tests its cloud partners' products in Ubuntu OpenStack configurations. Juniper and Canonical jointly oversee the automated testing of Ubuntu OpenStack with Juniper's Contrail Networking, developed in the open-source OpenContrail codebase. The addition of the carrier-grade SDN solution leverages OIL to ensure the solution meets the demanding needs of IT operators on multi-vendor hardware in a plethora of configurations.

Juniper and Canonical collaborate and coordinate product engineering and upstream contributions to continue to expand an open and functioning OpenStack ecosystem for enterprises and service providers to deliver cloud and NFV solutions. As partners, Juniper and Canonical also work with customers to incorporate service provider requirements into OpenStack, NFV and SDN open source projects.

## Canonical OpenStack with Contrail Networking

[Canonical OpenStack](#) ensures a straightforward implementation of a production-grade cloud. Ubuntu Server, the reference Linux-based OS for the OpenStack project used by over 65% of large-scale production OpenStack clouds, combines with Canonical's tested suite of cloud tools to create a cloud optimized for scale-out performance.

Building on the interoperability established in OIL, Juniper's [Contrail Networking](#) is now available as a proven and preferred SDN option for multi-vendor physical networks. It meets and exceeds the requirements of Canonical OpenStack's Neutron networking component with massive scale, and enhanced performance and reliability.

The agreement between Canonical and Juniper for coordinating seamless bidirectional support, enables Canonical to provide customers with a simple single point of procurement for cloud solutions and services based on this combined technology offering.

## Automated Deployment and Scale with Juju

Using Juju as the free and open source service modeling technology, you can install an OpenStack cloud within minutes reusing the expertise and best practices that Canonical has programmed into Juju charms for the core OpenStack projects available in Canonical OpenStack. With the addition of the Juju charms available for the Contrail Networking service, it is now equally simple to deploy your Canonical OpenStack cloud with SDN to reap the benefits of Contrail over OpenStack's default Neutron networking implementation. What's more, because Juju manages the deployment at the service level, not the machine level, it enables you to efficiently manage the cloud infrastructure and applications at scale as you grow.

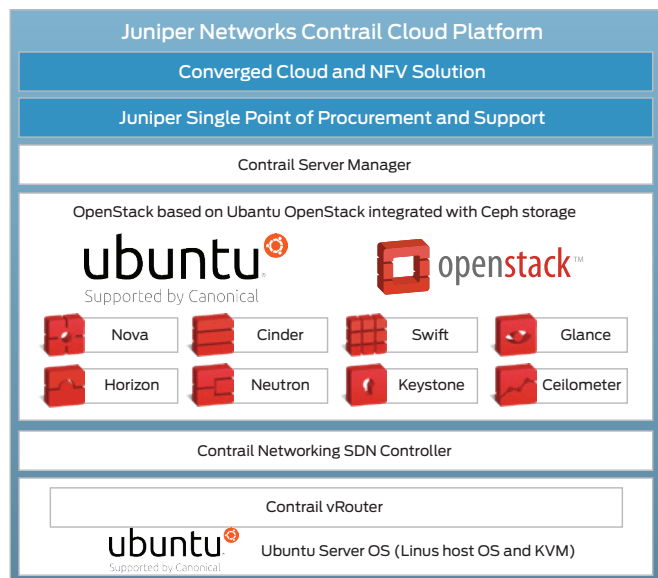
## Juniper Contrail Cloud Platform

Juniper's [Contrail Cloud Platform](#), is a joint carrier-grade OpenStack solution for cloud and converged NFV infrastructure that now integrates Contrail Networking, Ceph distributed storage, and server management with Ubuntu OpenStack and Ubuntu Server OS to maximize performance, scale and reliability of the OpenStack components.

The agreement between Canonical and Juniper for coordinating seamless bidirectional support, enables Juniper to also provide customers with a simple single point of procurement for cloud and NFV solutions and services for the entire suite of Contrail Cloud Platform components.

### Contrail Cloud Platform Solution Components

**Juniper Networks Contrail Networking:** Contrail Networking, developed in the open source OpenContrail codebase, is an SDN solution comprised of a highly available controller and a server-embedded virtual router. This leading cloud network virtualization and service orchestration solution is powered by open technology for multi-vendor hardware and improves business agility with security, availability, performance, automation, and elasticity.



**Ubuntu OpenStack:** Ubuntu OpenStack is the leading OpenStack Distribution used by over 2500 organizations worldwide. Ubuntu OpenStack's popularity comes from its focus on flexibility and performance so that end users can install the cloud they want with the performance they need. Ubuntu OpenStack closely tracks upstream OpenStack for a reference implementation that minimizes lock in and maximizes interoperability. Coupled with powerful deployment and management tools, Ubuntu OpenStack is the fastest way to become productive with open source IaaS.

**Ubuntu Server OS:** Ubuntu Server is the leading platform for scale-out computing. Designed at a time when cloud computing was starting to become a reality, Ubuntu Server has become the defacto standard operating system for workloads in clouds where it commands as much as 70% market share in the leading public cloud providers. With innovations such as Cloudinit, Linux containers (LXC and Docker), and most recently LXD, the container hypervisor, Ubuntu Server continues to stay at the forefront of DevOps deployments.

**Ceph Open Distributed Storage:** Ceph is an open-source distributed storage solution that Canonical and Juniper have tightly pre-integrated with OpenStack storage components and Contrail Networking for high-performance object, block, and volume storage. This single storage backend enables Contrail Cloud's OpenStack interfaces with virtual machine live migration features. Ceph is inherently scalable and highly available because of its distributed nature in implementing storage replication, stripping and self-healing. The Contrail Cloud graphical user interface and API additions simplify the storage monitoring, planning, disk additions and troubleshooting workflows.

**Contrail Cloud Server Manager:** Contrail's Server Manager interface enables turnkey deployment and management of the entire system's software on to the physical server infrastructure. Workflows include remote operating system re-imaging, remote server power cycling, provisioning and configuring server operating systems and application packages, and monitoring the server inventory with the system software and hardware status.

## Features and Benefits

- Simple deployment and maintenance of your OpenStack infrastructure. The integration available through Contrail Cloud reduces costs by enabling easier management and robust infrastructure scaling.
- World-class solution support available from either Canonical or Juniper as your preferred partner.
- Extreme performance tuning of all Ubuntu OpenStack's components to maximize performance.
- A high-performance and automated virtual networking overlay solution on multi-vendor physical network infrastructure to plug into OpenStack's Neutron networking component.
- Always-up and scale-out SDN control for elastic multitenant clouds with per-tenant or per-application segmentation in the form of networks (virtual and private networks) as a service, load balancing as a service, security policy, network analytics, and more.
- Always-up and scale-out software-defined storage for elastic multitenant clouds.
- An NFV policy framework streamlines service chaining virtualized network functions (VNFs) through and between virtual networks.
- Open standards-based virtual network gateway technology enables and automates the extension of VPNs securely outside data centers to remote facilities and across hybrid clouds. It is widely interoperable with IP-VPN and EVPN physical routers and switches.
- An open SDN API over and above Neutron offers additional networking workflows through an API-driven Web user interface and northbound APIs for deeper DevOps automation.
- A network analytics engine offers out-of-the-box instrumentation, troubleshooting, telemetry, and visibility for network traffic and cloud performance analytics with APIs for exporting data to specialized big data analytics systems such as Hadoop.

## Summary—Juniper and Canonical Deliver Cloud and NFV Solutions

Juniper and Canonical are delivering an open source doubleheader that frees cloud builders from costly and proprietary technologies of the past and future. You can get this carrier-class and turnkey OpenStack solution for converged cloud and NFV with the simplicity of unified Juniper sales and support as Contrail Cloud Platform. You can also choose Contrail Networking with Canonical OpenStack, using the suite of reliable and tested cloud tools from Canonical. Either way, you'll have the best of both worlds.

### Next Steps

If you would like to learn more about this joint solution, please contact your Juniper Networks representative for more information.

### About Canonical

Canonical is the commercial sponsor of Ubuntu, the leading open-source platform for cloud, personal computing and next-generation devices. Ubuntu delivers reliability, performance and interoperability to cloud and scale-out environments, and Canonical's scale-out expertise and orchestration technology enable software-defined networks and storage, providing the platform of choice for network equipment providers and operators. Ubuntu is the world's most popular operating system for OpenStack. Over 80% of the large-scale OpenStack deployments worldwide are on Ubuntu.

With developers, support staff and engineering centers all over the world, Canonical is uniquely positioned to help its partners and enterprise customers make the most of Ubuntu.

### About Juniper Networks

Juniper Networks is in the business of network innovation. From devices to data centers, from consumers to cloud providers, Juniper Networks delivers the software, silicon and systems that transform the experience and economics of networking. The company serves customers and partners worldwide. Additional information can be found at [www.juniper.net](http://www.juniper.net).

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