Happiest Minds* Simplifies OpenStack* Cloud Services for CommSPs

"Cloud-in-a-Box" platform, optimized for Intel® Xeon® processor-based servers, provides complete OpenStack-based service deployment infrastructure, augmented with open source software for automation of ongoing software maintenance.

Introduction

As consumer consumption of data services continues to grow, internet of things (IoT) services become popular, and 5G services open new revenue generating possibilities, communications service providers (CommSPs) are looking to expand their cloud infrastructure. This shift to the cloud is providing a foundation for more agile networks that can keep pace with customer demands. One popular platform option is OpenStack,* which offers a complete solution for cloud servers. But OpenStack is growing in complexity, which threatens its success in a CommSP network. Intel® Network Builders partner Happiest Minds* is responding to a need to simplify cloud service deployment with a fully integrated OpenStack server platform that includes automated deployment and software update capabilities.

Managing Growing OpenStack Complexity

Many CommSPs view OpenStack as an attractive option for building out a cloud infrastructure because it is open source and thus has no vendor lock-in. The OpenStack community is very active in adding new features, improving security capabilities and "hardening" the software for real-world CommSP cloud data center deployments.

But as OpenStack has added new capabilities, it has also grown more complex, which means it is more arduous to deploy and maintain. As of June 2018, there are nine core functionality components in OpenStack, in addition to more than 40 non-core functions.[1] The expanding capabilities of OpenStack add significant value, but also come with their own development and upgrade schedules.

This complexity makes ongoing manual upgrading of the system an expensive process that is hard to scale across an entire CommSP network that could include potentially thousands of servers, each possibly with a different OpenStack configuration. On top of these updates, there are virtual network functions (VNFs) that also must be deployed and maintained in a timely manner.

One approach to this complexity is to create a fully integrated OpenStack "cloud-in-a-box" system with all of the components installed along with automation to simplify deployment and ongoing upgrades.

Happiest Minds Creates OpenStack Cloud-in-a-Box

Happiest Minds' Cloud-in-a-Box (CIB) is a complete solution based on open source software that is optimized to run on servers powered by Intel® Xeon® processors. These include Intel Xeon Scalable processors, which feature scalability to deliver workload-optimized performance in data center and NFV applications.

The CIB solution is based on OpenStack compute (Nova*), network (Neutron*) and cloud controller software components. It is designed to provide remote deployment of a complete NFV service. All that needs to happen onsite is that the server must be installed and connected to the internet. The entire CIB solution can be deployed, updated, and orchestrated remotely, which can significantly reduce deployment and maintenance costs.

To manage CIB storage, Happiest Minds chose Ceph* to provide virtualized storage clusters for the CIB instead of the available OpenStack options, which are not optimized for managing storage clusters. The CIB leverages Juju,* an open source application modeling tool, running on a metal as a service (MAAS) cloud server to deploy, configure and scale the Ceph installation. By using a standalone Ceph management add-on to OpenStack, the CIB provides outstanding storage extensibility and scalability.

Once the OpenStack infrastructure components are installed, the CIB utilizes Tacker,* an open source VNF manager (VNFM) and NFV orchestrator (NFVO) for VNF deployment. Tacker deploys the VNFs utilizing YAML rules. As part of this phase, the open source Data Plane Development Kit (DPDK) is installed for enhanced data plane performance and a virtual test environment is established to give the ability to fine tune VNF performance.

While a variety of VNFs can be included, the standard offering from Happiest Minds includes the following:

- virtual local traffic manager
- virtual router
- virtual firewall
- virtual session border controller

The Open Platform for NFV (OPNFV)* is used in conjunction with OpenStack to establish the NFV infrastructure. In the CIB, this environment is modified using YardStick,* an open source project to ensure infrastructure compliance, and Functest,* which is software that delivers testing methodology, test suites, and cases to ensure VIM and NFVI elements of an OPNFV environment. This solution upgrades the automated deployment capability with the ability to also provide performance and conformance testing of the VNFs and of the entire system.

Another key element required to remotely manage a CIB is monitoring the functional status of the hardware and software behavior testing and confirmation and availability of OpenStack services. For this functionality, the CIB has integrated open source system monitoring software Nagios.* Along with these tools, the CIB has procedures for failure detection, troubleshooting, and auto recovery.

This technology combination has created a standalone platform that can support multiple CommSP services. In the standard configuration outlined above, the CIB is ideal as a remote office router supporting network security and voice transport. But the use of open technology means the system supports other services as well. The built-in remote deployment and orchestration/management tools allow easy re-configuration of VNFs for a very agile service provisioning platform. The support for modern storage systems provides a scalable and reassignable storage system when compared to legacy hard drives.

Conclusion

Today's CommSP operating environment puts a premium on network service agility and scalability. OpenStack-based cloud services can deliver these benefits but come with much more deployment and maintenance complexity than legacy systems. Happiest Minds' CIB solution leverages a wide range of open source technologies to build a platform that maximizes the agility and dramatically reduces the complexity.
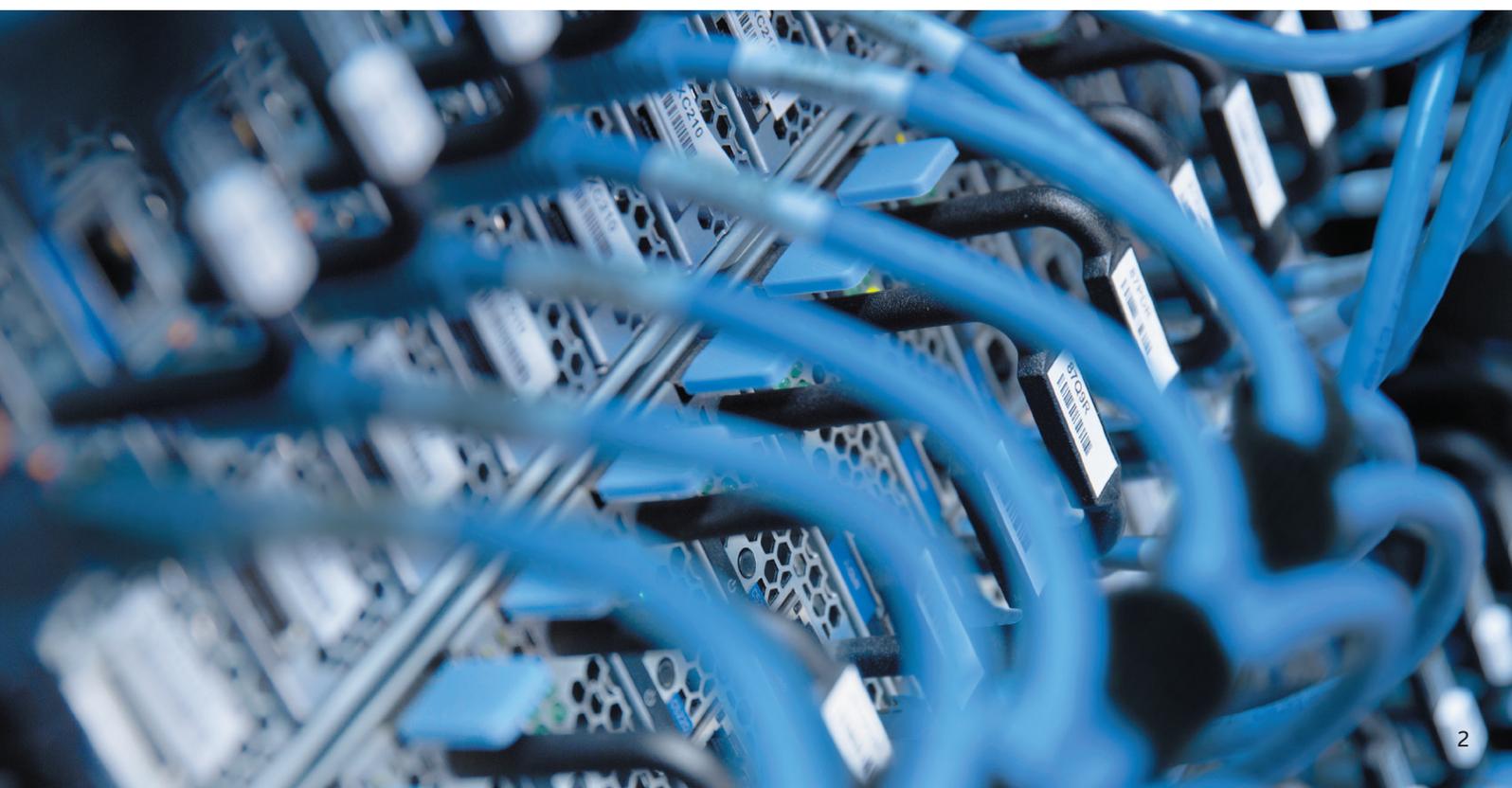
About Happiest Minds

Happiest Minds enables digital transformation for enterprises and technology providers by delivering seamless customer experience, business efficiency, and actionable insights through an integrated set of disruptive technologies: big data analytics, internet of things, mobility, cloud, security, and unified communications. Happiest Minds services have applicability across industry sectors such as retail, CPG, e-commerce, banking, insurance, hi-tech, engineering R&D, manufacturing, automotive and travel/transportation/ hospitality. As a Mindful IT Company, the focus is on "Being Mindful" and "Doing Mindful," which involves perceiving immersively, processing non-judgmentally, and performing empathetically. Headquartered in Bangalore, India, Happiest Minds has operations in the US, UK, The Netherlands, Australia, Middle East, and Turkey.

About Intel® Network Builders

Intel Network Builders is an ecosystem of infrastructure, software, and technology vendors coming together with communications service providers and end users to accelerate the adoption of solutions based on network functions virtualization (NFV) and software defined networking (SDN) in telecommunications and data center networks. The program offers technical support, matchmaking, and co-marketing opportunities to help facilitate joint collaboration through to the trial and deployment of NFV and SDN solutions. Learn more at http://networkbuilders.intel.com.