# VIRTOOL NETWORKS TESTS SCALING CAPABILITIES OF THEIR VIRTUAL NETWORK ANALYZER

**VirTool Networks is a Canadian technology company that develops software tools for cloud network operations. They came to CENGN to validate that their Virtual Network Analyzer (VNA) can operate at large scale in CENGN's OpenStack environment.**

Kelowna-based VirTool Networks introduced their first product a year ago at the 2017 OpenStack Summit in Boston. It has continued to receive positive feedback due to its unprecedented features and ease of use. Looking to build on that momentum, VirTool Networks completed a CENGN project deploying their solution in our commercial grade OpenStack environment. The project provided them the opportunity to test the scalability performance of OpenStack cloud network analysis with their VNA product.

## OPENSTACK EXPLAINED

OpenStack is a free, open source cloud operating environment that allows its users to construct and manage cloud systems. It provides its users with software tools to control, process, store, and network the components of a data center. The OpenStack project began in 2010 and has grown to be one of the most widely adopted cloud computing platforms.

## OPENSTACK TROUBLESHOOTING BEFORE VNA

Configuring and troubleshooting an OpenStack cloud requires deep networking expertise and a strong understanding of OpenStack's internals. While the software platform is a free open source project, it can often be difficult to configure the system to a company's requirements and needs. Existing troubleshooting techniques to diagnose network issues begin with a checklist of manual steps using command line interface (CLI) tools to determine the network's behaviour. This can be a very time-consuming, expensive, and frustrating process, even for those familiar with OpenStack networking. VirTool Networks is simplifying OpenStack operation by providing real-time network visualization, packet flow analysis, and a dashboard that displays all the information a user needs to know about their OpenStack cloud.

## VIRTUAL NETWORK ANALYZER FEATURES

VirTool's VNA provides companies with the ability to visualize and troubleshoot their entire OpenStack environment as well as diagnose problems visually using packet capture and packet tracing with their graphical user interface.

This OpenStack network troubleshooting solution makes analysis easy for its users by allowing them to:

- View an entire cloud network in real-time
- View current CPU utilization of the physical and virtual hosts
- Easily locate traffic hot spots and congestion points
- View live switch and bridge interface statistics
- Instantly capture traffic from any point in the cloud
- View the paths that packets take through the network
- Visually identify where packets are being dropped
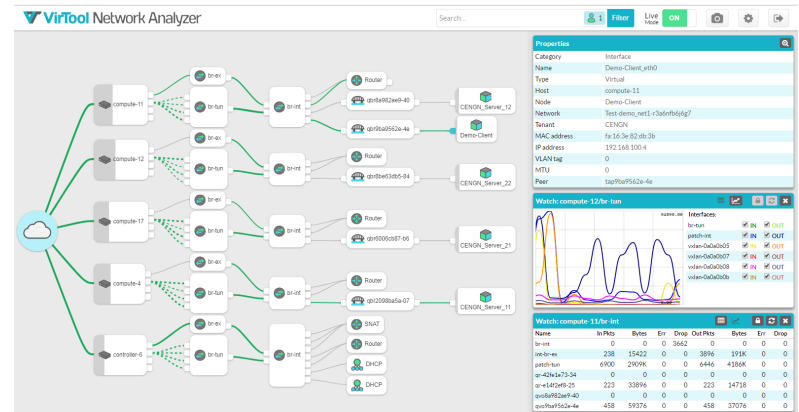


Example of the VNA dashboard depicting an OpenStack Network

VNA has three components: an agent, a collector, and the dashboard. The VNA agent is deployed on physical nodes such as the compute, controller, and storage nodes in the network. The VNA Collector collects the information picked up by the agents that are deployed on the nodes. The VNA Dashboard is connected to the controller to display all the information in real time on the users' web browser. Users can drill down on the dashboard to view more information and filter for packet types such as TCP, ICMP, and more to determine traffic patterns or collect statistics.
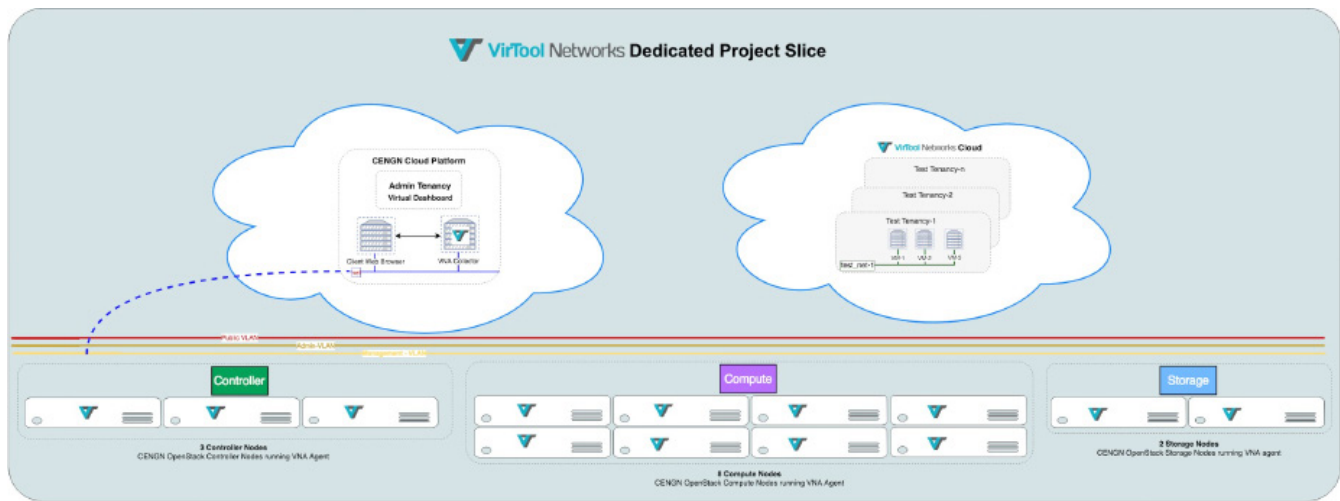
## PROJECT SETUP

To test VNA, the agent and collector were deployed on the CENGN Testbed and then a series of tenant workloads were gradually added in groups.

**Step 1:** The VNA agent was deployed on 3 controller nodes, 8 compute nodes, and 3 storage nodes. The VNA collector was deployed on a virtual machine (VM) in the CENGN environment. The VNA dashboard was run using a web browser deployed on a VM within the CENGN network.

**Step 2:** A single instance of the traffic generation test workload was deployed in order to baseline its performance and confirm resource requirements.

**Steps 3:** Blocks of tenant workloads were added in stages and the performance and correctness of VNA was verified.



VNA Cloud Overview
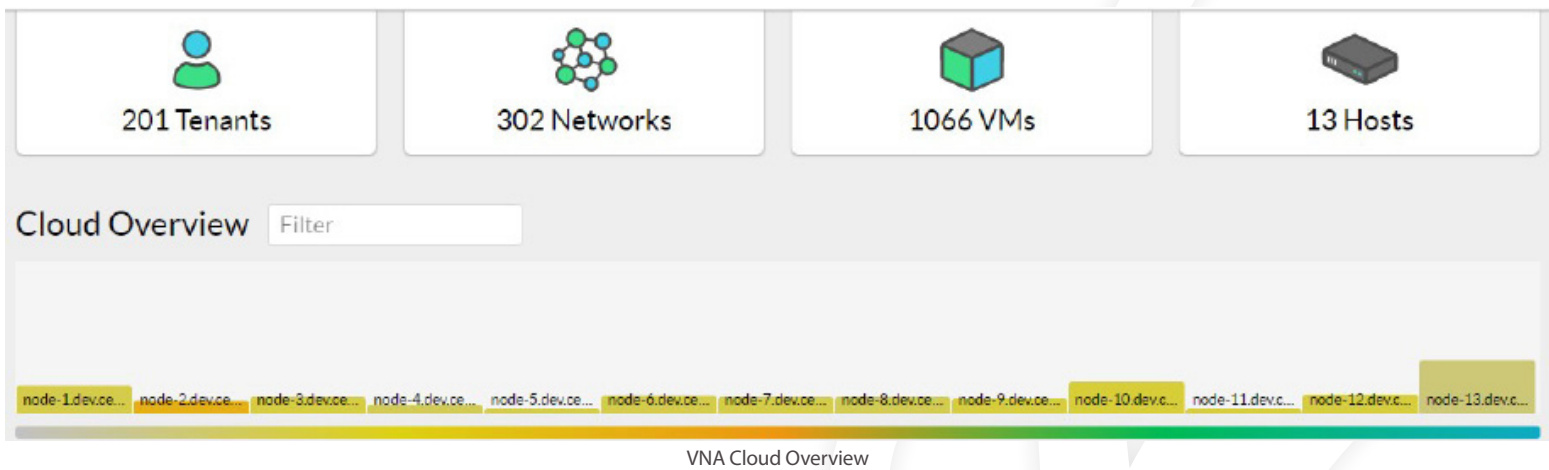
## THE RESULTS

The environment was successfully scaled up to reach the project targets, which surpassed 200 tenants, 300 tenant networks, and more than 1000 VMs across the 8 compute nodes in the CENGN cloud test segment. During the tests, the VNA cloud visualization continued to perform correctly along with all visibility, metrics, and search capabilities. The user interface remained responsive, and its packet capture and tracing features continued to function as expected. CPU and memory utilization on the hosts were measured and found to be well within reasonable expectations based on the high density of VMs per physical host.

The test results showed that the VNA solution is able to perform well at large scale and provided a benchmark on the resource requirements it needs to be deployed in bigger environments. This is great information for VirTool to provide prospective customers as they look at deploying VNA in their large-scale clouds.

Completing a CENGN project provided value for VirTool Networks in a number of ways. Deploying their solution in a larger OpenStack environment determined the capabilities of their product when scaled. In addition to scaling, the project provided insights on other areas that the solution can be improved upon. Upon completing this project, VirTool Networks gained the data needed to ensure their solution is scalable to potential new clients with larger cloud platforms.