

VNF deployment of active Virtual Test Agents to ensure network performance and end-user experience

In this use case, Alcatel-Lucent and CloudBand Ecosystem member Netrounds have worked to demonstrate a programmable activation test and end-user assurance solution based on Virtual Network Function (VNF) deployment of Netrounds' Virtual Test Agents (VTAs) on the CloudBand platform.

CloudBand ECOSYSTEM PARTICIPANTS

- Alcatel-Lucent
- Netrounds

Challenge

In the past hardware-based test and measurement (T&M) equipment has been used to test activated services and hardware-based monitoring probes have been used to ensure services. This equipment is not well suited for usage in automated delivery processes built for virtualized services.

It is difficult to attach hardware devices in a virtual world. Moreover, it is not agile and is very expensive to physically distribute the T&M hardware required at specific geographic locations. In addition, the use of classic hardware-based T&M devices results in high CAPEX and OPEX.

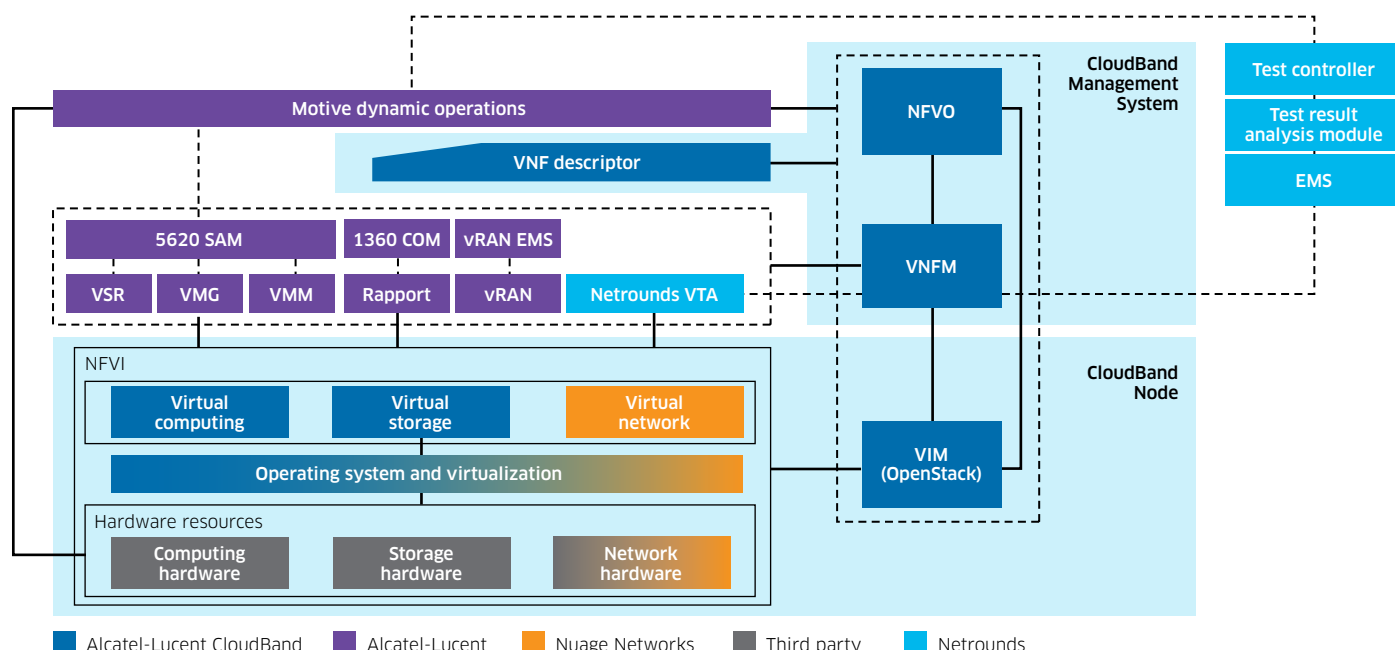
Solution components

The suggested solution is an automated deployment of Virtual Test Agents to enable orchestrated activation testing and assurance.

The solution is composed of the following components:

- Alcatel-Lucent CloudBand Node providing the Network Functions Virtualization Infrastructure (NFVI) and Alcatel-Lucent CloudBand Management System (CBMS) activating NFV Orchestrator (NFVO), together serving as a complete carrier-grade NFV platform purpose-built for service providers.
- Netrounds Control Center, including test controller and analysis functions, with a feature-rich northbound API for tight integration toward a Motive operations support system (OSS).
- Distributed VTAs, deployed on-demand and remotely controlled through the Control Center API, enabling active assurance of networks, services and applications end to end and from the end-users' perspective.

Figure 1. Joint solution architecture

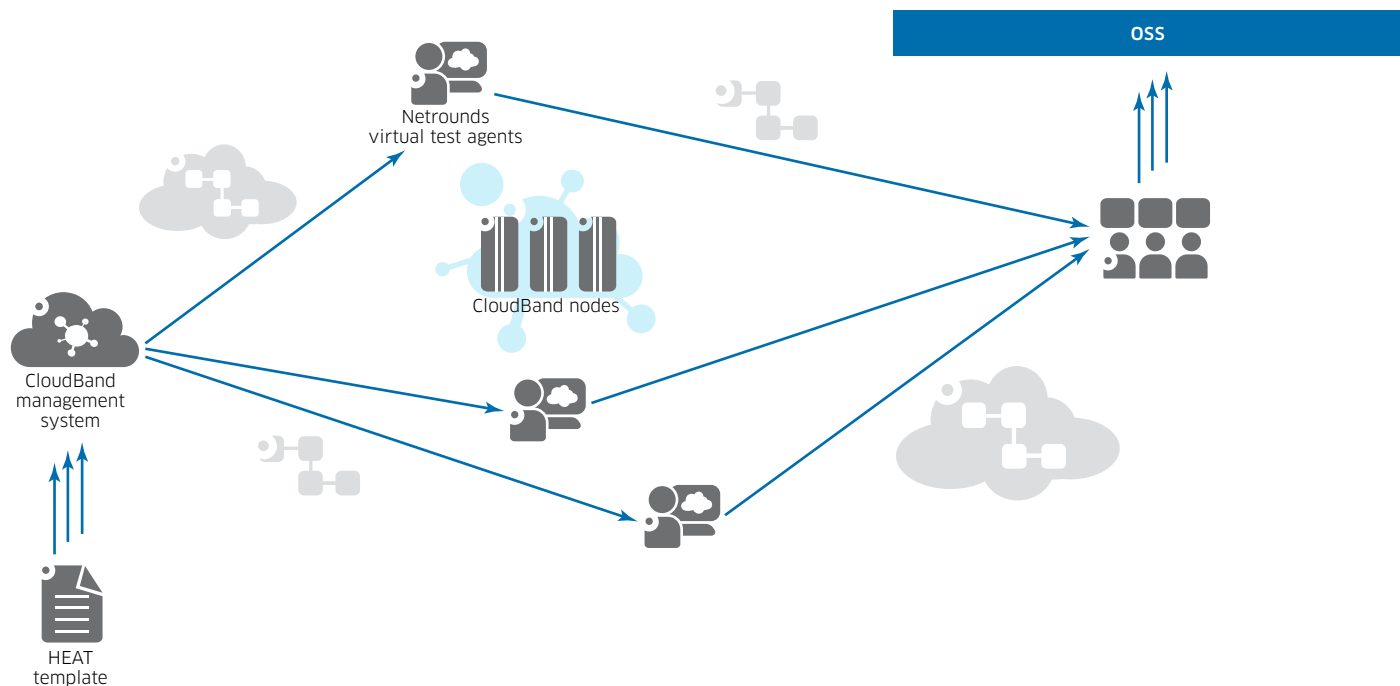


How does it work?

It is assumed that the Service Orchestrator/OSS, such as Alcatel-Lucent Motive or other, has configured all required network resources contributing to the end-to-end service being provisioned. This includes:

1. Configuring network devices and interfaces, both physical and virtual.
2. Instantiating required VNFs for the service, including VTAs used for activation testing, assurance and troubleshooting.

Figure 2. Service Orchestrator/OSS process



This use case aims to deliver feedback to the Service Orchestrator/OSS with information as to whether the service was initially delivered successfully, and also to produce feedback over time if the service level degrades from the end-user perspective. This makes it possible for the Service Orchestrator to take actions to restore the service quality to expected levels and thereby close the loop between fulfillment and assurance.

The following steps explain how a service provider can virtualize its physical test and assurance infrastructure using the CBMS NFV capabilities:

1. Based on an OpenStack heat template, the CBMS performs the following:
 - a. Instantiates one or several Netrounds NFV-based VTAs on a distributed CloudBand Node NFVI at strategic locations along the service path.
 - b. Configures physical and virtual networks required for the VTAs to interconnect with the Netrounds Control Center for remote management and coordination.

- c. Configures physical and virtual interfaces and networks toward the VTAs required to reach relevant services that are to be tested and monitored.
2. The Service Orchestrator/OSS initiates necessary tests and assurance monitoring of end-user experience using the Control Center API.
3. Test and assurance monitoring results and performance metrics are collected from all participating VTAs, aggregated and stored in the Netrounds Control Center database and made available for the Service Orchestrator/OSS in real time through the Netrounds Control Center API.

For detailed troubleshooting, drill-down and collaboration, the Netrounds Control Center provides its own web portal. The same web portal is also used as an integrated development environment for network engineers to build automated test templates and monitoring scenarios.

VNF and platform vendor solution components

Netrounds

Netrounds is a programmable test and service assurance solution using software-based and traffic-generating Virtual Test Agents that are easily used and deployed in distributed NFV environments. All activities are remotely controlled and coordinated through the Netrounds Control Center, using template-based scenarios.

CloudBand

The Alcatel-Lucent CloudBand Management System deploys the Netrounds Virtual Test Agents and the Service Orchestrator initiates activation tests and service level agreement (SLA) assurance monitoring using the Netrounds Control Center API.

Table 1. Key benefits of joint solution

CLEAR ROI	TELCO TRANSFORMATION	INSTANT AND ON-DEMAND
<ul style="list-style-type: none"> Automate time-consuming and manual activation tests Avoid expensive field work requiring skilled workforce Eliminate costly and purpose-built hardware testers and devices 	<ul style="list-style-type: none"> Take gigantic leaps toward an assured, orchestrated and agile network Leverage speed of software for test and assurance Integrate service activation and SLA assurance 	<ul style="list-style-type: none"> Instant orchestration and deployment of remote test capabilities Live feedback of end-user experience, KPIs and SLAs On-demand diagnostics and analytics

Summary

This use case demonstrates a virtualized test and assurance solution using Netrounds Virtual Test Agents orchestrated and instantiated on CloudBand VNF infrastructure and remotely controlled by the Netrounds Control Center. This solution enables cost-effective and large-scale distribution of test and troubleshooting measurement devices that help to reduce service fulfillment cycle time of assured services from months to minutes.