PLUMgrid | BROADCOM®

Container and OpenStack Traffic Monitoring with Broadview™ Instrumentation and PLUMgrid CloudApex

About BroadView™ Instrumentation and PLUMgrid CloudApex

What is BroadView Instrumentation?

Broadcom's BroadView™ Instrumentation is a software suite that enables advanced network monitoring solutions and leverages unique telemetry offered by industry-leading Broadcom silicon. BroadView offers advanced packet tracing tools to reduce dropped packets and increase network performance. BroadView delivers unprecedented visibility into the internals of a switch for proactive congestion or microburst analysis. BroadView's groundbreaking features facilitate innovative solutions for network optimization and automation triggered by advanced analytics.

BroadView highlights:

- Open instrumentation API across the Broadcom silicon portfolio
- Industry-leading advanced telemetry features for datacenter and service provider networks
- Reference implementations for integration with OpenStack, enabling faster time-to-market

What is PLUMgrid CloudApex?

PLUMgrid CloudApex is a visualization and monitoring platform, that works in conjunction with PLUMgrid container and OpenStack networking suite to display real-time status of physical and virtual resources including status of underlay, overlay, virtual domains, containers, virtual machines, and security policies in software defined data centers. PLUMgrid CloudApex simplifies everyday operations at scale, speeds network deployments, and minimizes production downtime.

CloudApex highlights:

- Affinity-based GUI: Mapping between virtual and physical resources
- Real-time update on system health with cloud-wide search for cloud entities
- Troubleshooting and remediation with real-time heatmap visualization to diagnose and fix problems

Solution Highlights

Smarter Analytics

BroadView provides many features to enable smarter analytics. Features such as Buffer Statistics Tracking, headroom usage, and timing awareness provide unprecedented visibility and enable better control over the internals of the switch state, thereby leading to smarter analytics.

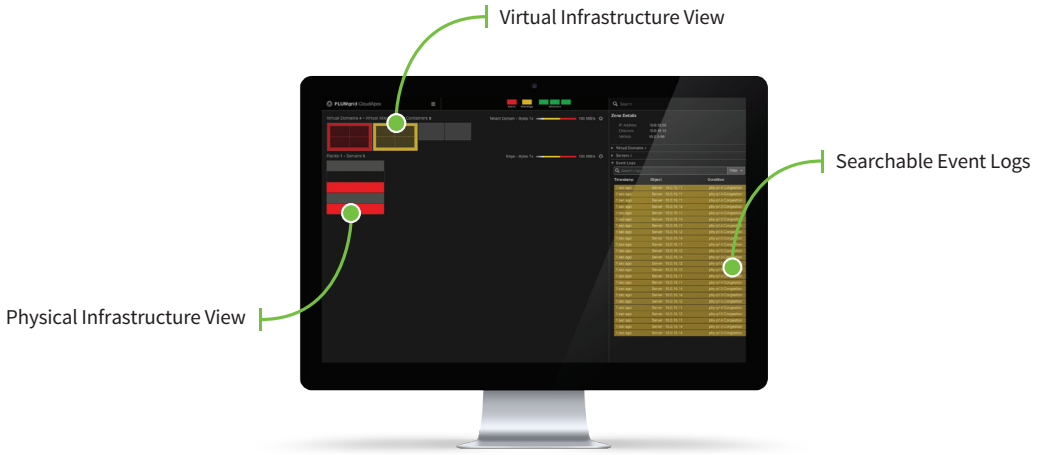
Real-Time Cloud Visibility

PLUMgrid CloudApex is a real-time visualization and monitoring platform for container and OpenStack clouds, designed to help cloud operators and administrators throughout the entire lifecycle of a cloud.

Overview

Data centers need monitoring solutions that display physical and virtualized resources that are intuitive, easy, and intelligent. As container and virtual machine deployments increase with hundreds to thousands of virtual endpoints, monitoring solutions are needed that display and correlate analytics from physical infrastructure such as servers and switches, to virtual resources. Traditional alerts-based GUI and modern visualization techniques must converge to provide a holistic view of software defined data centers. With CloudApex, PLUMgrid delivers a breakthrough, intuitive monitoring platform that displays, correlates, and remediates issues reported by underlay and overlay infrastructure with detailed logging, configurable heatmaps and security policy views.

PLUMgrid CloudApex is designed to help IT and cloud operators throughout the entire lifecycle of running container and OpenStack clouds. With support for Docker, Mesos, and Kubernetes environments, PLUMgrid CloudApex provides a comprehensive monitoring tool with the broadest container portfolio. For OpenStack data centers, PLUMgrid CloudApex supports Canonical Ubuntu, Mirantis, Rackspace, and Red Hat. From initial deployment to runtime operations all the way to upgrades, PLUMgrid CloudApex collects information from thousands of locations in the cloud and correlates and presents them to the user in an intuitive and simple visualization format.



Broadcom and PLUMgrid have joined forces by adding BroadView Instrumentation capability to CloudApex through a southbound (SB) Broadview collector plugin to communicate with the BroadView Agent, receiving realtime data about the underlay buffer state. Broadcom has also developed the BroadView Instrumentation REST API so that applications can access the Instrumentation service. The solution makes use of two open source projects, both written in Python, which are hosted at OpenStack's github site.

Solution Highlights

- Innovative SDN-based traffic monitoring solution that combines the open source BroadView suite and PLUMgrid's CloudApex
- Seamless compatibility and ease of integration by utilizing native APIs for BroadView
- Visualize data at a granular level—down to the server, switch, port, virtual domain, VM, and container
- Improved data center visibility and better user experience by combing Broadview with CloudApex's affinity based GUI
- Enforce policy consistency across north-south and east-west data center traffic through centralized management.
- SDN driven stable environment accessible to vendors for NFV. interop testing that includes firewalls for tenant separation

The first, broadview-lib, provides an API for sending RESTful requests to configure the BroadView agent. It can parse data transmitted by the agent into an easily consumable set of objects. The second project, broadview-collector, is a plugin-based web server that receives async notifications from the agent, and uses community developed plugins to publish them a variety of services in the data center. This solution uses a PLUMgrid-contributed plugin for publishing the collected data into CloudApex.

The integrated solution showcases an innovative SDN-based traffic monitoring solution that combines the open source BroadView suite and PLUMgrid's CloudApex. CloudApex utilizes the native APIs for BroadView, ensuring seamless compatibility and ease of integration. With BroadView and CloudApex, users can leverage data at a granular level—down to the server, switch, port, virtual domain, VM, and container—and apply these to the OpenStack and container based environment to make proactive decisions. The end result provides a better user experience and greater application availability, with much improved data center visibility.

Benefits

- Comprehensive container and OpenStack Clouds monitoring solution, mapping underlay networks congestion to overlay virtual domain view with BroadView Instrumentation and PLUMgrid CloudApex
- Intuitive physical and virtual resources visualization and traffic congestion prevention with microburst detection, leading to much improved and automated SLA compliance
- Powerful visualization for BST counters as searchable logs with congestion location indication in both virtual and physical infrastructure

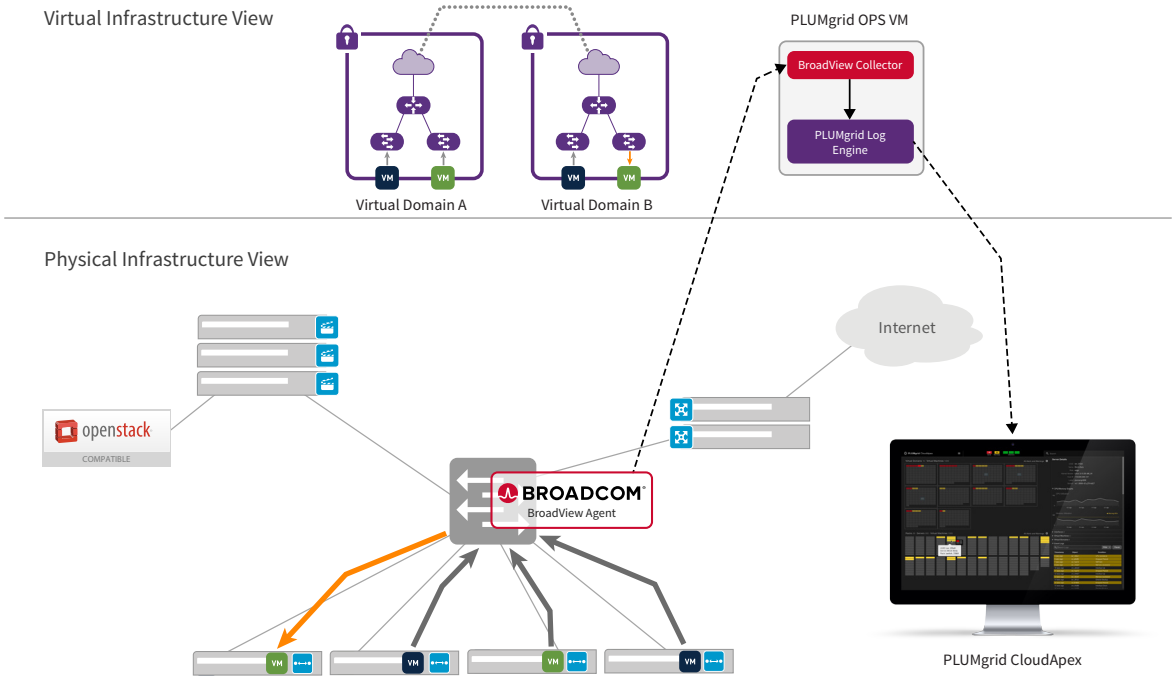
Demo Components

- EdgeCore AS-5712 switch running:
  - OpenSwitch OS
  - BroadView Agent
- x86 servers to host OpenStack with PLUMgrid ONS and CloudApex
- BroadView Collector (https://github.com/openstack/broadview-collector)PLUMgrid OPS VM with BroadView Collector plugin to monitor logs and statistics
- Traffic generation through iPerf

PLUMgrid Ignition

PLUMgrid Ignition provides the keys to test drive the installation, configuration and operation of PLUMgrid Open Networking Suite (ONS) and PLUMgrid CloudApex for Containers & OpenStack.

For more information, visit: http://www.plumgrid.com/plumgrid-ignition/



Demo Flow

- EdgeCore AS5712 switch runs OpenSwitch with BroadView Agent
- In PLUMgrid ONS enabled OpenStack cloud, workload VMs have been deployed in two different Virtual Domains
- Congestion flow is introduced when multiple VMs send UDP traffic over limit of the receiver VM can hold
- Broadview Agent pushes logs into PLUMgrid log engine which can be visualized on the CloudApex UI
- CloudApex identifies the congestion in both virtual and physical infrastructures

About Broadcom

Broadcom (NASDAQ: AVGO) is a diversified global semiconductor leader built on 50 years of innovation, collaboration and engineering excellence. Broadcom's extensive product portfolio serves multiple applications within four primary end markets: wired infrastructure, wireless communications, enterprise storage and industrial & others. Broadcom is changing the world by Connecting everything®.

For more information, visit: www.broadcom.com

PLUMgrid is a leader of secure and scalable software-defined networking (SDN) solutions for containers & OpenStack® clouds. To learn more about PLUMgrid visit: http://www.plumgrid.com