

AppFormix

Product Overview

Today's software-defined cloud infrastructure and associated workloads are massive, dynamic, and highly elastic. To operate effectively, such infrastructure not only requires the ability to adapt to the rate of change, but also the intelligence to anticipate and prevent future risks and satisfy emerging demands, all in real time.

AppFormix is built from the ground up to address these challenges with ease of use in mind. AppFormix enables cloud infrastructure to be "self-driving" by automating operations with real-time visibility, predictive analysis, and real-time orchestration and optimization capabilities.

Product Description

Juniper Networks® AppFormix leverages big data analytics and machine learning as part of a distributed analysis platform, making the power of self-driving infrastructure available at the core of the cloud. AppFormix redefines state-of-the-art telemetry and management across software-defined infrastructure and application software layers, delivering real-time and historic monitoring, performance visibility, and dynamic optimization features to improve cloud orchestration, security, accounting, and planning for users.

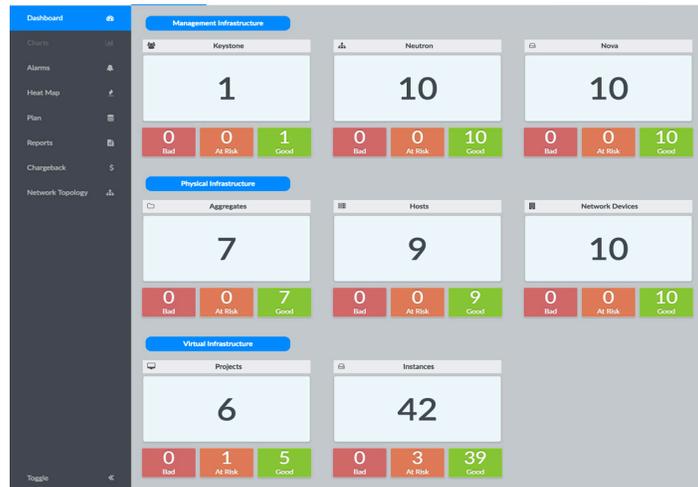


Figure 1: AppFormix infrastructure dashboard

AppFormix operates in hybrid, private, and public enterprise and telco cloud environments built on OpenStack, Kubernetes, and Amazon Web Services (AWS). AppFormix manages containers, virtual machines, and virtualized network functions (VNFs) to support multitenant, dynamic, and constantly evolving cloud infrastructure and workloads.

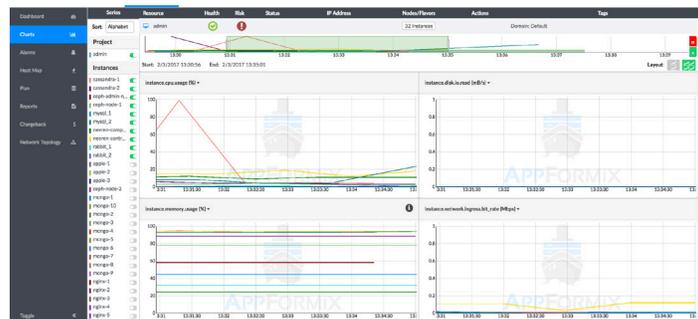


Figure 2: AppFormix real-time charts



AppFormix analyzes metrics in real time across all aspects of shared infrastructure—compute, storage, and networking—and associates resource consumption with containers and virtual machines. Operators use AppFormix to control and visualize how infrastructure resources are utilized by workloads, in order to plan for and provide adequate capacity to ensure smooth application performance.



Figure 3: AppFormix reports

AppFormix provides operators of software-defined data centers with a comprehensive toolset that offers visibility into operational performance and infrastructure resources.



Figure 4: AppFormix host dashboard

AppFormix is a fundamental building block of Contrail Enterprise Multicloud for enterprises and Contrail Cloud for service providers.

Architecture and Key Components

AppFormix provides resource control and visibility for hosts, containers, and virtual machines in any cloud infrastructure.

The AppFormix software consists of multiple components:

- A smart agent to monitor and analyze resource usage on infrastructure devices (compute, network, storage, etc.)
- A Platform Controller, which offers REST APIs to configure the system
- A DataManager, which distributes and stores data from multiple agents
- Analytics modules that correlate and analyze events across the entire infrastructure
- A dashboard, which provides a web-based user interface
- Adapters, which discover platform-specific resources and configure the Controller (adapters exist for OpenStack, Kubernetes, Amazon Elastic Compute Cloud [EC2], and Contrail SDN)

Agents run on the resource devices of the infrastructure that provide the compute, network, and storage resources required to execute and connect application workloads both in and across clouds. A compute node may be a bare-metal host or a virtual machine (VM). The network resource devices can be physical or virtual as well.

With a built-in distributed analytics engine, AppFormix Agent processes and analyzes raw resource metrics on-the-fly and at the source before sending useful signals to the rest of the system. Such advanced technology and distributed architecture ensure timeliness of the operational data as well as scalability of the deployment.

The remaining components run on a class of “infrastructure nodes,” such as the OpenStack infrastructure service nodes or Kubernetes master nodes, which execute services that power software-defined infrastructure. The host on which the AppFormix platform components execute, known as an AppFormix platform host, can be either a physical server or a VM.

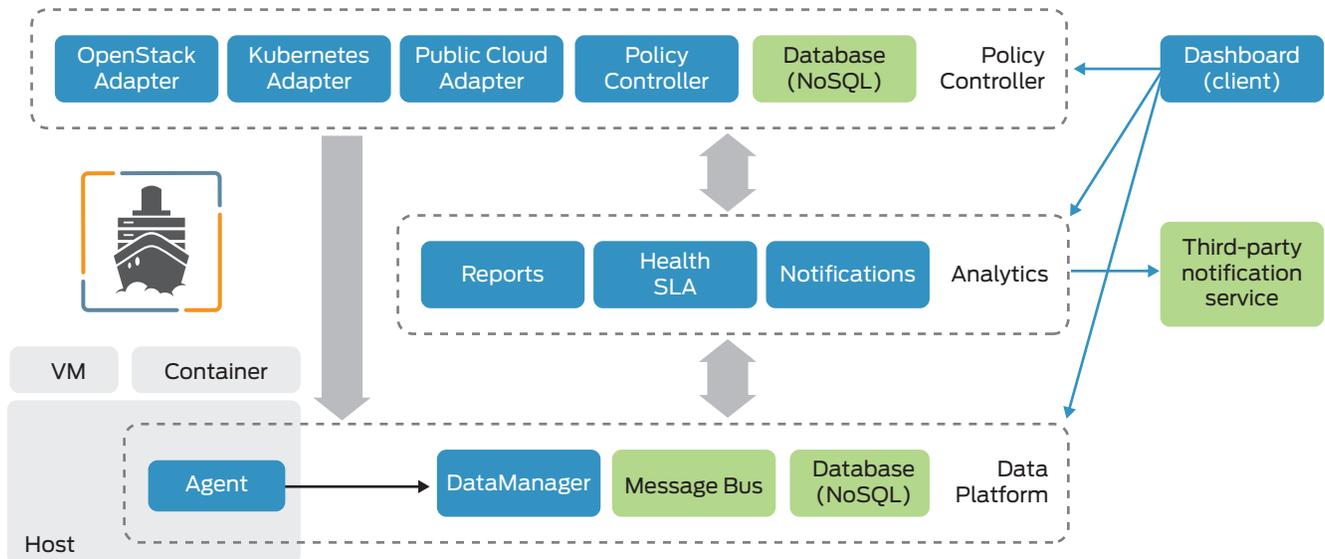


Figure 5: AppFormix architecture

Features and Benefits

Real-Time Metrics and Alarms

A “metric” is a measured value for an element in the infrastructure, providing operators with essential visibility into all facets of an infrastructure. AppFormix Agent collects and calculates comprehensive metrics, in real time, for hosts and instances, as well as for networks, storage, services, and other elements. These metrics are then displayed in the AppFormix Dashboard as real-time charts and reports.

With AppFormix, an operator can also configure alarms against values or conditions of metrics or groups of metrics within the infrastructure. Whenever these configured values or conditions are met, alarms are triggered in real time to notify the operator. AppFormix software also plots these alarms on charts in both real time and time-series fashion, giving the operator a holistic view of current status as well as past trends.



Figure 6: AppFormix Alarms screen

Machine Learning

AppFormix can apply machine learning to dynamically learn and baseline the performance of applications and infrastructure elements while they operate, generating alarms when real-time metrics deviate from historical trends that exceed a user-configured tolerance level. The result is a monitoring policy that is aware of the dynamic nature of workloads that place differing resource demands over time. Operators can also leverage this machine learning capability to monitor applications and infrastructure elements when the performance profile and operational boundaries are not yet known.

Health Monitor

The AppFormix Dashboard provides operators with a quick and intuitive overview of the health and projected risk of the infrastructure and its workloads via the Health Monitor pane. Health status can indicate whether a resource is currently operating outside a user-specified performance policy, while risk uses historical trends to determine whether a resource may be unhealthy in the future.

For example, if the AppFormix Platform Controller is not receiving heartbeats from a host, then that host and all of its instances will be marked as unhealthy with a condition called “missed heartbeat.”



Figure 7: AppFormix Health Monitor

While AppFormix supplies a default set of health and risk profiles, users may also configure customized profiles to suit their environment.

Notifications

When alarms are triggered, in addition to the graphical representation on the dashboard UI, AppFormix also provides users with the ability to notify external systems of the alarms.

For each alarm, AppFormix can post a structured description of an event as a JSON payload to an external HTTP endpoint. These notifications can be used to initiate any action or workflow, whether it is corrective, preventive, or otherwise, to keep the infrastructure and its workloads operating in their optimal state.

For operators’ convenience, AppFormix comes pre-integrated with PagerDuty and ServiceNow, two of the most popular incident management platforms in the industry.

Reports, Capacity Planning, and Chargeback

AppFormix reports enable users to analyze how infrastructure resources are consumed over time. Reports may be generated over a specified time period and organized by different scopes: project, host, department, and so on. In each case, the report shows resource utilization for a specific project or scheduled on a particular resource device. The dashboard displays reports in both graphical or tabular formats. Users may also download report data as an HTML-formatted report, raw comma-separated value (CSV) file, or JSON-formatted data for further analysis.



Figure 8: AppFormix report graphical view

Table with columns: Project ID, Action Instance, Flavors, Cost ID, Department Cost, VCPUs, VCPUs Usage (1hr), Active Memory (MB), RAM Usage (MB) (1hr), Disk Size (GB), Disk Usage (GB) (1hr), Total Hrs, Last Hr. The table contains multiple rows of resource usage data.

Figure 9: AppFormix report tabular view

In many cases, simply knowing the resource consumption is not enough. To help administrators accurately plan for the future, AppFormix software provides robust capacity planning functionality that gives operators a simple, precise view of the infrastructure's current resource configurations, used resources, and available resources as well as usage patterns. Based on this valuable data, administrators can make informed decisions regarding capacity expansion, resource re-allocation, or both.

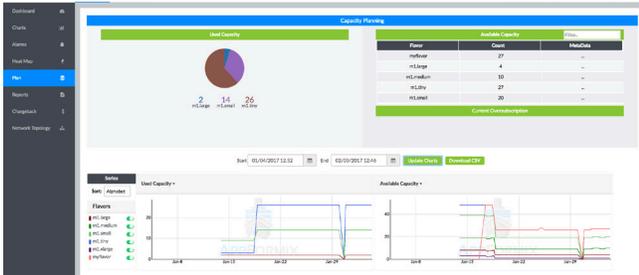


Figure 10: AppFormix capacity planning view

For those who need to seamlessly integrate cloud infrastructure with one's existing business support system (BSS), or are simply looking to implement a new one, AppFormix provides a chargeback feature that allows operators to set prices for the compute, network, and storage resources offered within the infrastructure. AppFormix software calculates the cost based on resource usage and presents the costs in reports and cost forecasts. Operators can configure cost-sharing among different organizational entities (e.g., departments).

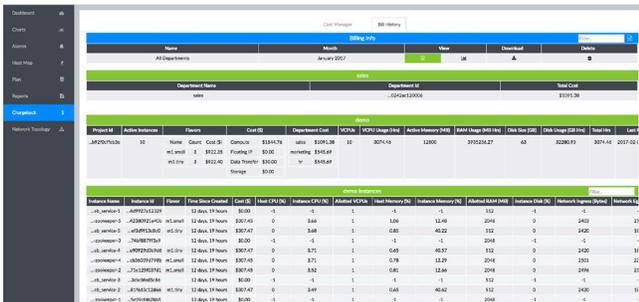


Figure 11: AppFormix chargeback report



Figure 12: AppFormix chargeback chart

Available on AWS Marketplace

AppFormix is available on the AWS Marketplace to provide automated operations, visibility, and reporting within AWS VPCs, private clouds, and on-premises resources. Customers using AppFormix on AWS can bring their own AppFormix license; contact a Juniper sales representative to obtain one.

Specifications

AppFormix components can operate on any physical or virtual compute resources. For the most up-to-date AppFormix installation and resource requirements, please refer to the AppFormix product installation guide on www.juniper.net.

The AppFormix Platform Controller node has the following minimum requirements:

- CPU: 8 cores (virtual or physical)
- Memory: 16 GB
- Storage: 100 GB (recommended)

Ordering Information

This product adheres to the Juniper Software Advantage pricing model; therefore, the following items constitute an order:

- Select a software license based on the number of sockets required. The license is either subscription (fixed term) or perpetual (unlimited term).
 - A subscription software license includes Juniper Care Software Advantage, entitling the purchaser to software updates and upgrades, 24x7 remote technical support, and online support.
 - A perpetual software license excludes Juniper Care Software Advantage; the latter must be purchased.
 - If the order includes a hardware product/platform, select a hardware license based on the networking, connectivity, and/or security requirements (e.g., interface options, I/O, services). You may need to purchase additional licenses in support of the base hardware license (e.g., power cables, network interface cards).
 - If this is a virtual appliance/software product, you would not buy any hardware license from Juniper, but instead would procure the hardware elsewhere. For information on supported hypervisor(s) and VM requirements, please refer to the technical documentation for this product at <https://www.juniper.net/customers/support/>.
- Juniper Networks products are sold directly as well as through Juniper partners and resellers. For information on how to buy, please visit <http://www.juniper.net/us/en/how-to-buy/index>.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

Corporate and Sales Headquarters
Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or +1.408.745.2000
Fax: +1.408.745.2100
www.juniper.net

APAC and EMEA Headquarters
Juniper Networks International B.V.
Boeing Avenue 240
1119 PZ Schiphol-Rijk
Amsterdam, The Netherlands
Phone: +31.0.207.125.700
Fax: +31.0.207.125.701



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