

Intent Driven Network Operations with AppFormix Advanced Analytics Platform

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DURING THIS SESSION: YOU WILL BE ABLE TO...

- Understand AppFormix network monitoring and analytics capabilities
- Understand how AppFormix
 - Simplify network operations
 - Maximize network performance
 - Drive network automation

CHALLENGE

Data Collection and Analysis



LARGE # OF HETEROGENEOUS HARDWARE & SOFTWARE COMPONENTS

- Large # of heterogeneous, fragile & interconnected hardware and software components → make it a challenge to run cloud-enabled infrastructure at scale



HUGE AMOUNTS OF MONITORING DATA FROM MULTIPLE SOURCES

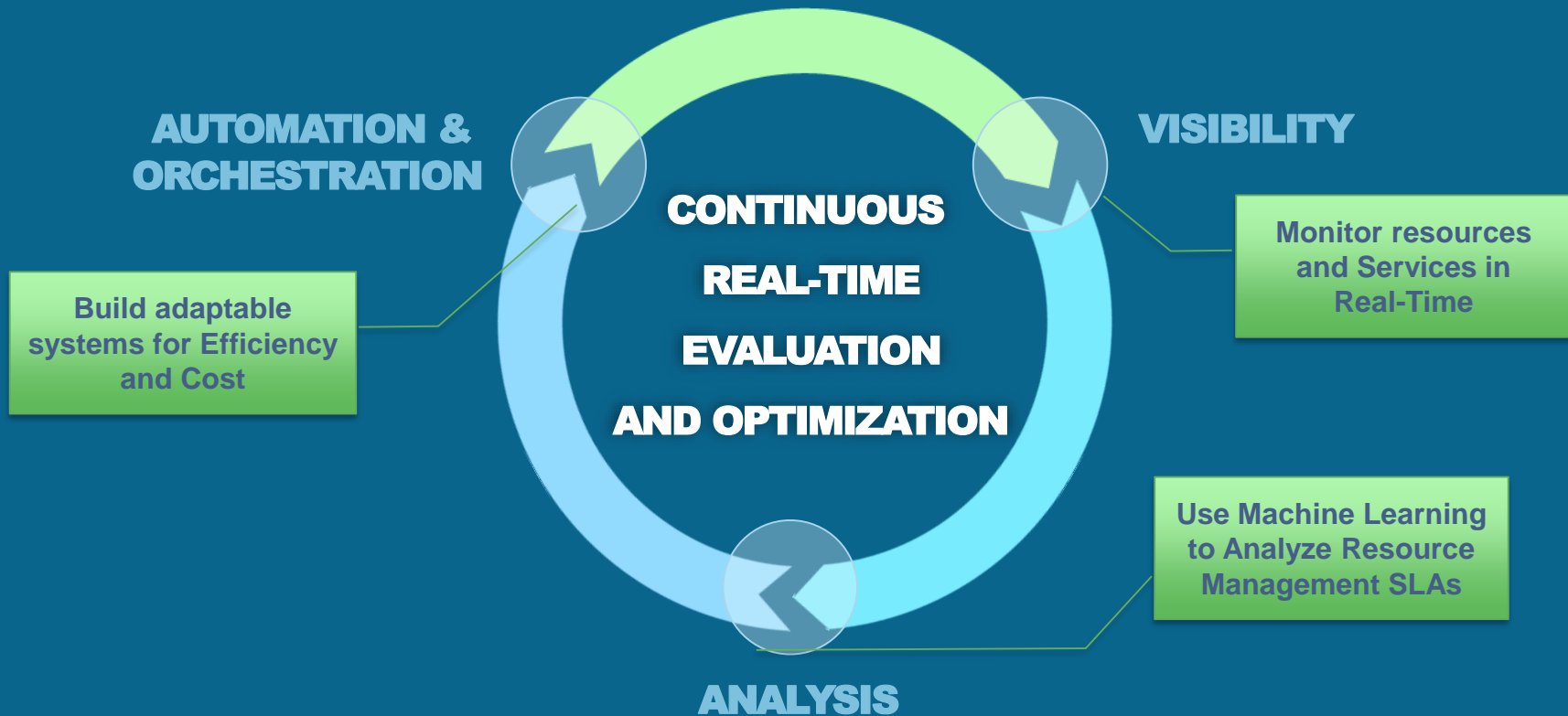
- Multiple data sources generate large amount of data
- Real-time management and monitoring of large & disparate data sets requires complex data, network and storage management tools



NO OUT-OF-THE BOX SOLUTION

- Legacy tools were not built for cloud-enabled environments
- Open-source based tools require significant customization and lack production-grade reliability and scalability

“INTENT-DRIVEN INFRASTRUCTURE”



CROSS LAYER VISIBILITY

Stream analysis to monitor
SLAs and predict faults

APPFORMIX

Real-time optimizations to
improve efficiency and ensure
service availability

Single operations platform to monitor all layers of the infrastructure

APPLICATION & SERVICES



CLOUD INFRASTRUCTURE



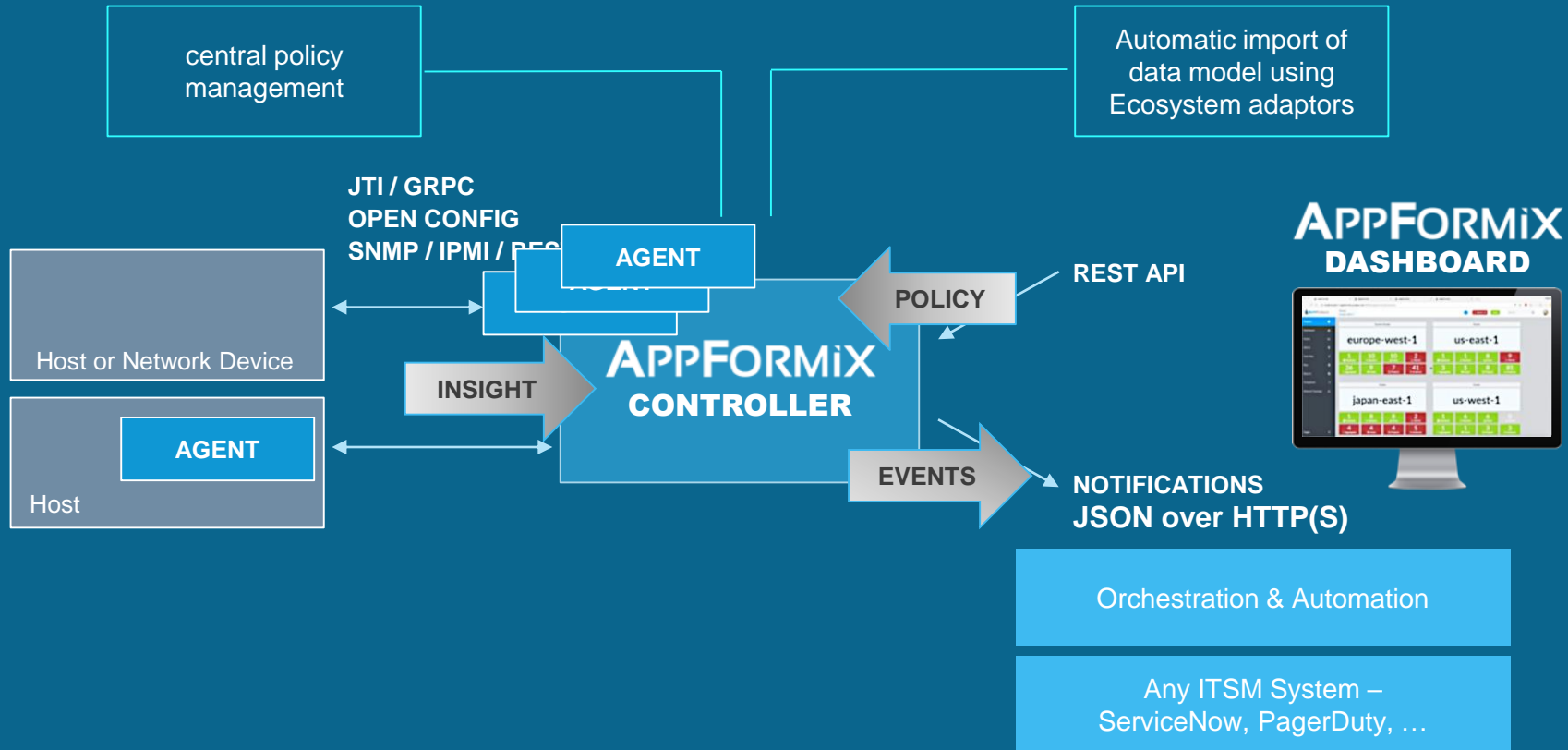
SOFTWARE DEFINED INFRASTRUCTURE



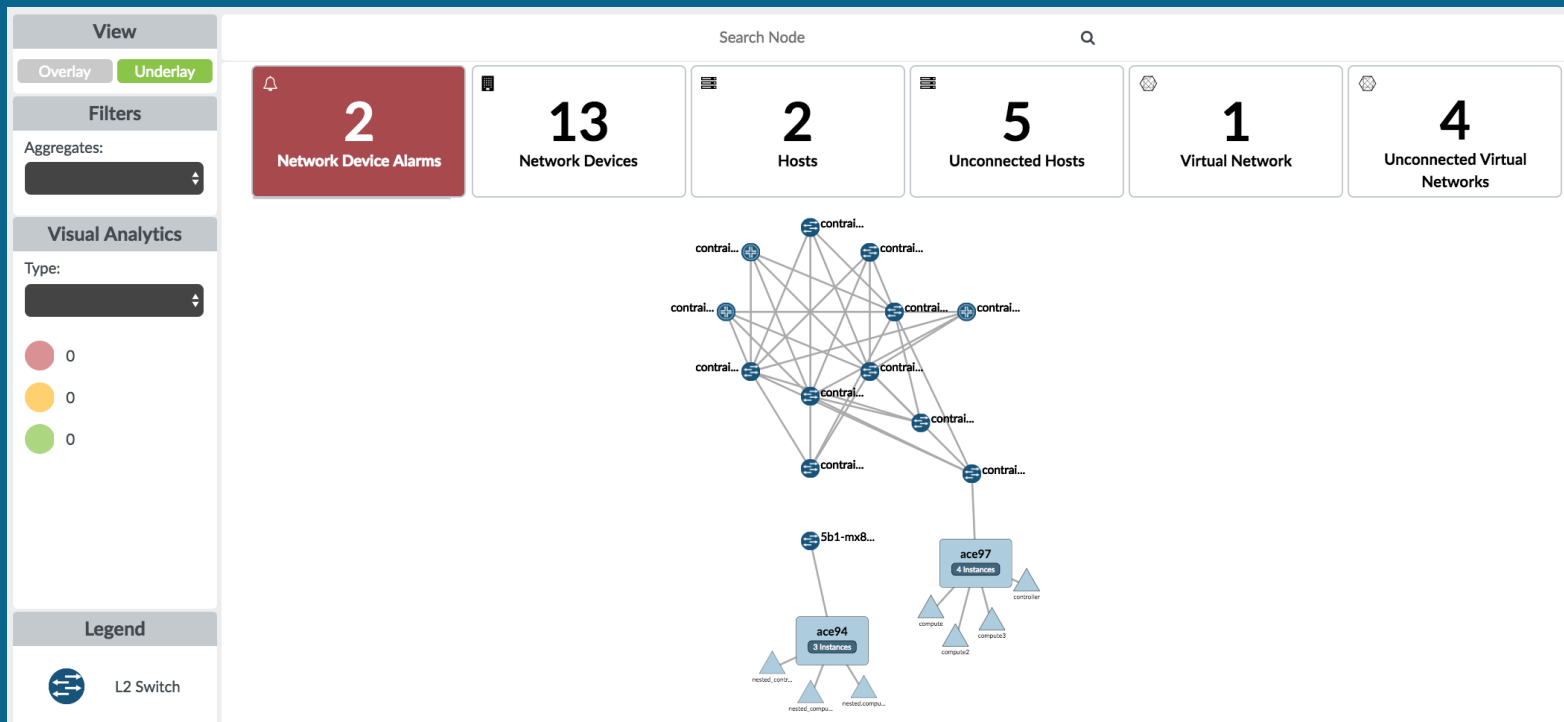
PHYSICAL INFRASTRUCTURE



APPFORMIX ARCHITECTURE

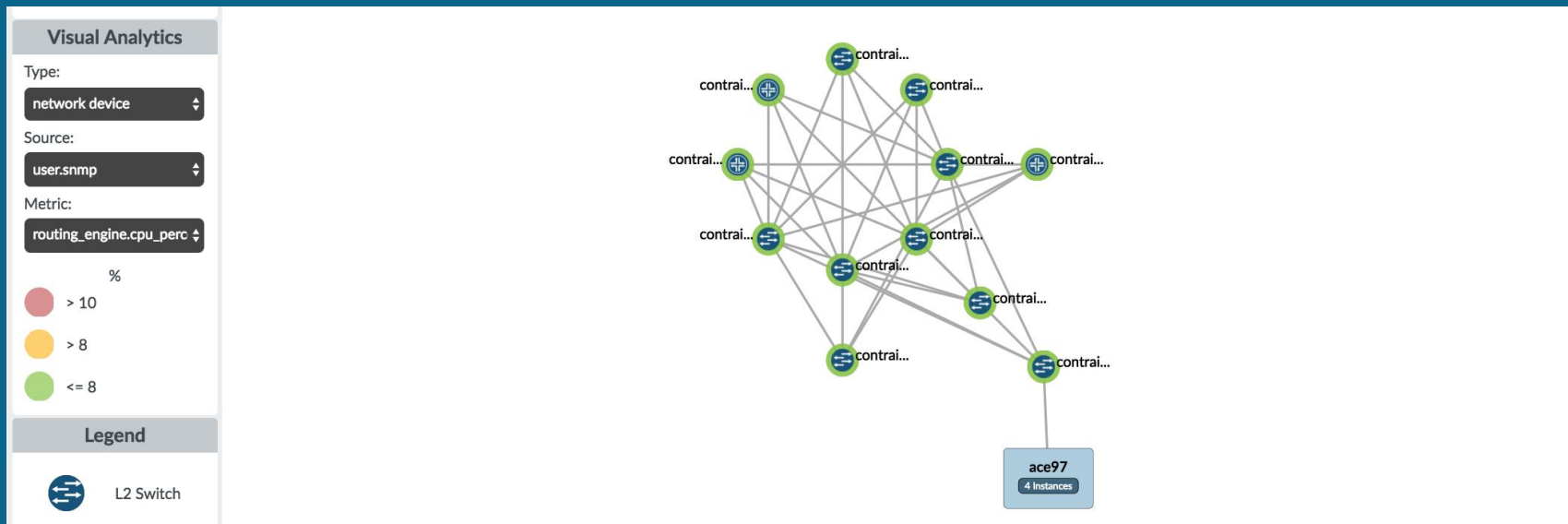


NETWORK TOPOLOGY - UNDERLAY



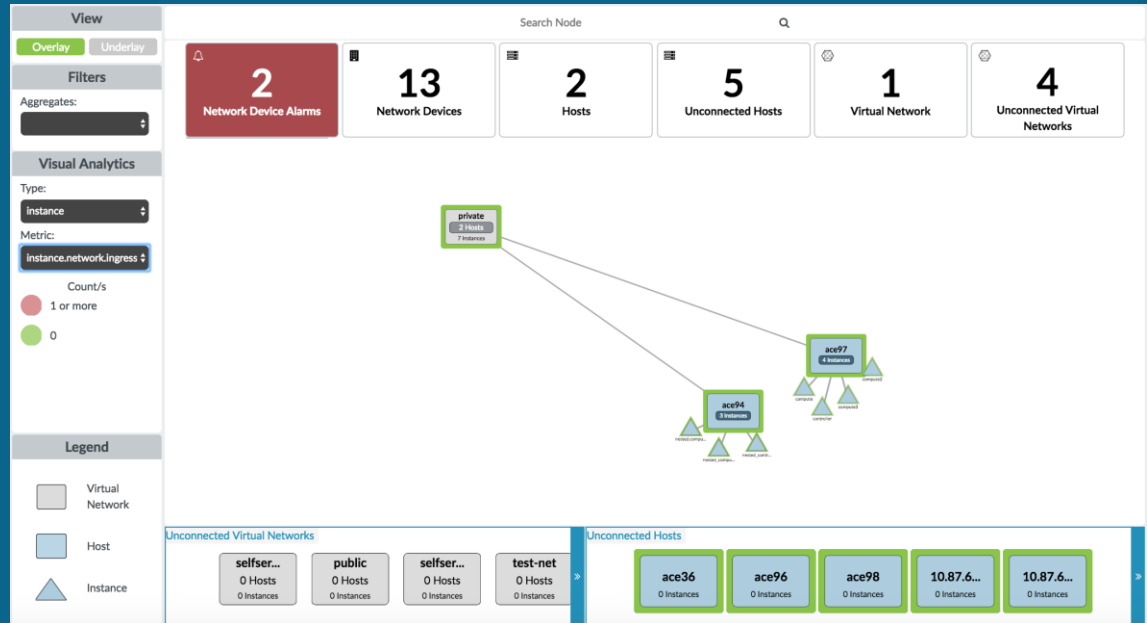
NETWORK DEVICE HEATMAP

Real-time network health and performance at-a-glance















































NETWORK TOPOLOGY - OVERLAY

- Overlay network discovery and monitoring via integration with infrastructure orchestrators and SDN controllers
- Correlated topology between overlay and underlay entities



NETWORK INFRASTRUCTURE SLA

User-configurable Health and Risk SLA Profiles

<div> <div>13</div> <div>Total</div> <div>0</div> <div>Bad</div> <div>0</div> <div>Risk</div> <div>13</div> <div>Good</div> </div>								
Resource	View	Health	Risk	Management IP	Node Type	Switch Type	Source	Description
5b1-mx80-1...				10.87.68.120	physical-router		user.jti	
contrail-qfx1				10.102.44.1	physical-router	qfx3500s	user.snmp	
contrail-q...				10.102.44.10	physical-router	qfx3600-16qs	user.snmp	
contrail-q...				10.102.44.11	physical-router		user.snmp	
contrail-q...				10.102.44.12	physical-router		user.snmp	
contrail-qfx2				10.102.44.2	physical-router		user.snmp	
contrail-qfx3				10.102.44.3	physical-router		user.snmp	
contrail-qfx4				10.102.44.4	physical-router	qfx3500s	user.snmp	
contrail-qfx5				10.102.44.5	physical-router		user.snmp	
contrail-qfx6				10.102.44.6	physical-router	qfx3500s	user.snmp	
contrail-qfx7				10.102.44.7	physical-router	qfx3500s	user.snmp	

Health Profile

Host

Aggregate

Instance

Project

Network Device

Virtual Network

Profile has been applied. Please delete profile to add or remove rules.

Threshold: Any Rule

Rule Name	Rule Description
network_device_in_error_rate	Generate network_device alert for ifInErrors if sum over 1s duration interval is above 0 in 1 of last 1 intervals.
network_device_out_error_rate	Generate network_device alert for ifOutErrors if sum over 1s duration interval is above 0 in 1 of last 1 intervals.

Risk Profile

Host

Aggregate

Instance

Project

Network Device

Virtual Network

Profile has been applied. Please delete profile to add or remove rules.

Threshold: Any Rule

Rule Name	Rule Description
network_device_in_error_rate	Generate network_device alert for ifInErrors if sum over 1s duration interval is above 0 in 1 of last 1 intervals.
network_device_out_error_rate	Generate network_device alert for ifOutErrors if sum over 1s duration interval is above 0 in 1 of last 1 intervals.
network_device_in_discard_rate	Generate network_device alert for ifInDiscards if sum over 1s duration interval is above 0 in 1 of last 1 intervals.
network_device_out_discard_rate	Generate network_device alert for ifOutDiscards if sum over 1s duration interval is above 0 in 1 of last 1 intervals.

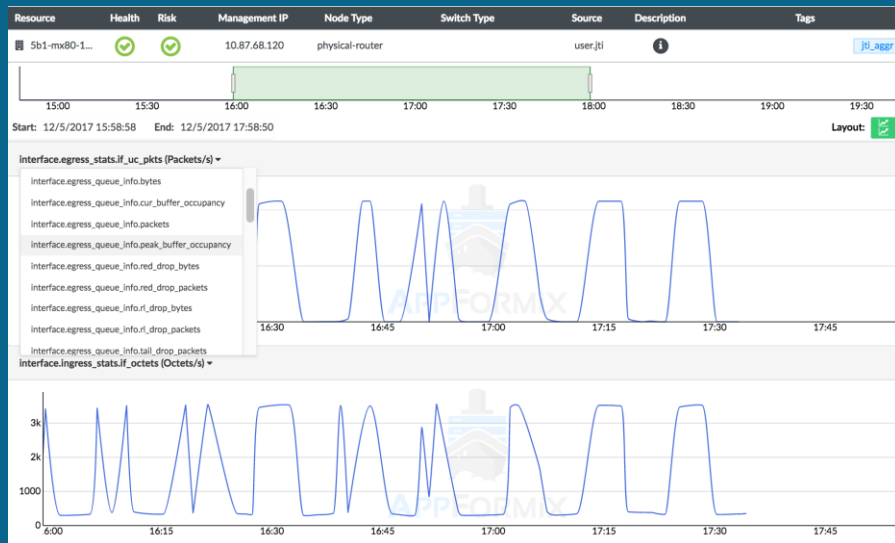
NETWORK TELEMETRY

JUNOS Telemetry Interface (JTI)

- Real-time streaming telemetry at scale
- Performance and resource monitoring, as well as accounting
- Available across many Juniper product lines
- Additional JTI information:
 - https://www.juniper.net/documentation/en_US/junos/topics/concept/junos-telemetry-interface-oveview.html

ANALYZING JTI METRICS

All collected JTI metrics can be charted, alarmed and used in SLA rules in AppFormix



Details

ifOutOctets is above the threshold of 10000 Octets/s.

ifInOctets is above the threshold of 100 Octets/s.

interface.egress_errors.if_discard
interface.egress_errors.if_errors
interface.egress_queue_info.allocated_buffer_size
interface.egress_queue_info.avg_buffer_occupancy
interface.egress_queue_info.bytes
interface.egress_queue_info.cur_buffer_occupancy
interface.egress_queue_info.packets
interface.egress_queue_info.peak_buffer_occupancy
interface.egress_queue_info.red_drop_bytes
interface.egress_queue_info.red_drop_packets
interface.egress_queue_info.rl_drop_bytes
interface.egress_queue_info.rl_drop_packets
interface.egress_queue_info.tail_drop_packets
interface.egress_stats.if_1sec_octets
interface.egress_stats.if_1sec_pkts
interface.egress_stats.if_bc_pkts
interface.egress_stats.if_error
interface.egress_stats.if_mc_pkts
interface.egress_stats.if_octets
interface.egress_stats.if_pause_pkts
interface.egress_stats.if_pkts
interface.egress_stats.if_uc_pkts

SNMP-BASED MONITORING

Monitor network devices via SNMP

[AppFormix Settings](#)
[Services Settings](#)
[Notification Settings](#)
[SLA Settings](#)
[Oversubscription](#)
[Plugins](#)
[Network Topology](#)
[Network Devices](#)
[About](#)

Network Device Settings

SNMP Devices

JTI Devices

Configured SNMP Devices

contrail-qfx1

MIBs	
IF-MIB::ifTable	
IF-MIB::ifXTable	
TCP-MIB::tcp	
APPFORMIX_ROUTING_	
enterprises.2636.3.1.13.1	

+ Add MIB

Update MIBs

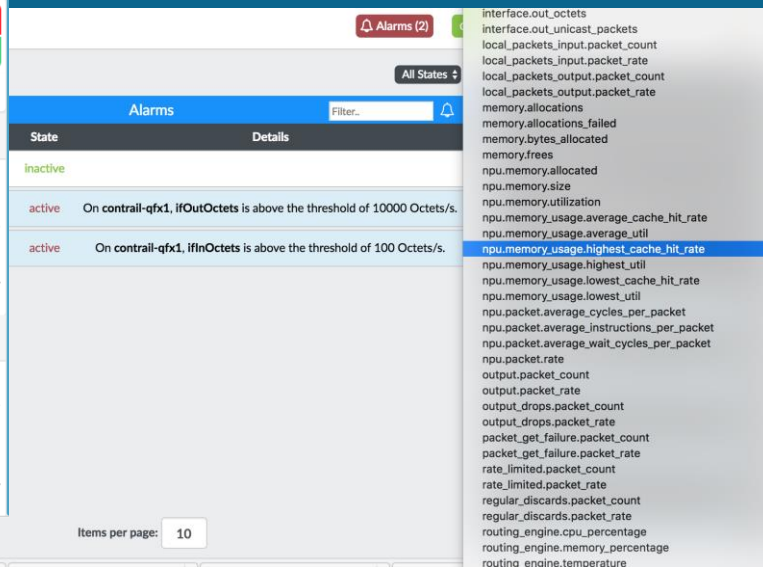
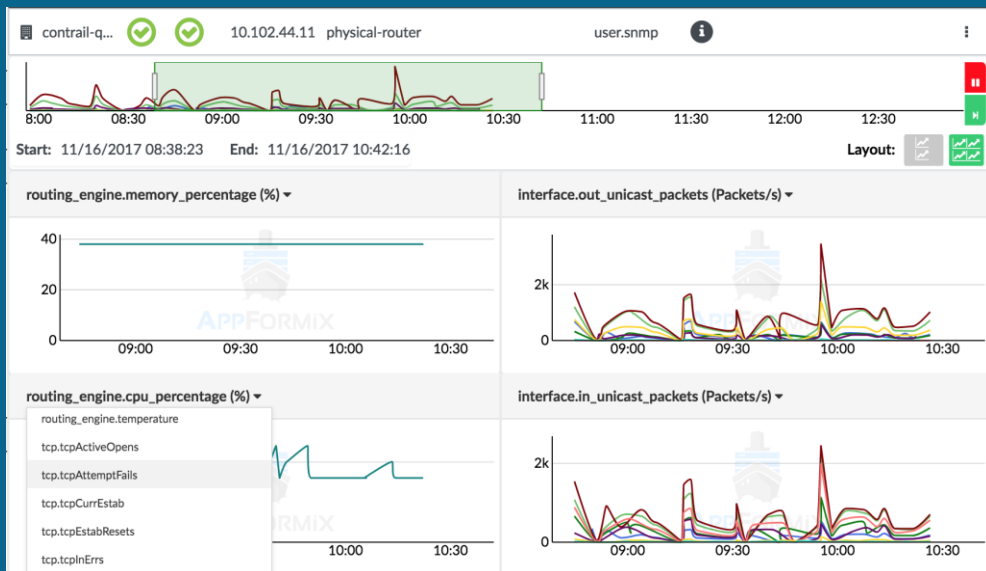
contrail-qfx10

contrail-qfx11

contrail-qfx12

ANALYZING SNMP-BASED METRICS

All collected metrics via SNMP can be charted, alarmed and used in SLA rules in AppFormix

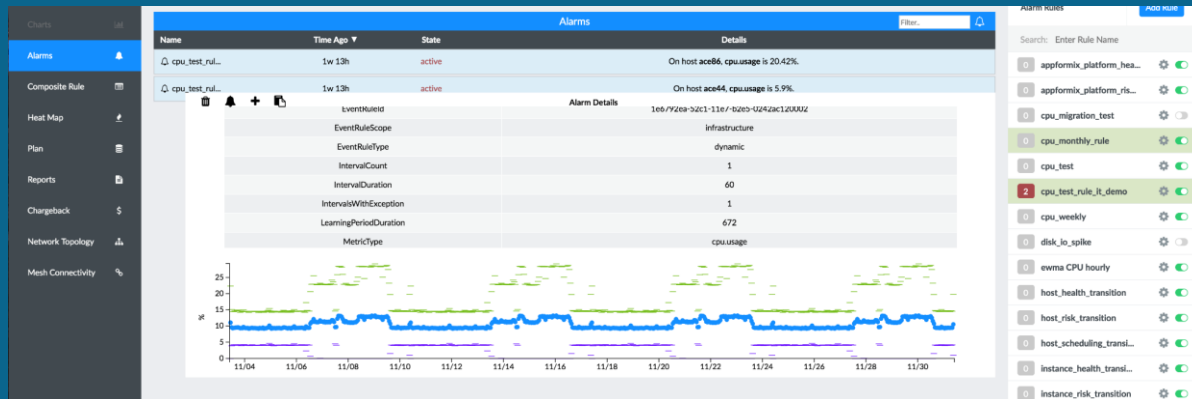


STATIC ALARMS

- Alarm is active when measured value is above or below a static threshold
- Simple to understand and implement
- Good for well-understood performance profile with “constant” boundaries
 - Packet drops, interface flaps, CPU temperature, disk space

DYNAMIC ADAPTIVE ALARMS

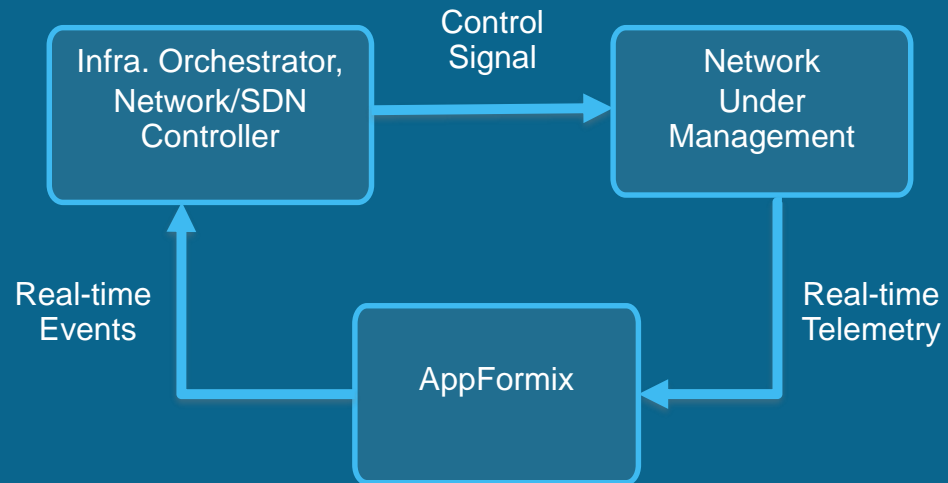
- Machine-learning to determine baseline value
 - Value of “normal” is variable
- User configures acceptable deviation from baseline
- Detect and alarm on sudden spikes and Anomalies



CLOSE-LOOP AUTOMATION

Sending notification signal to ANY HTTP endpoint

- Improve network and infrastructure in real-time
 - Performance, resiliency, scalability, responsiveness, economics
- Example of notification endpoints
 - Network automation system and controllers
 - Incident Management Systems.
 - Collaboration tools



FOR MORE INFORMATION ON APPFORMIX

- <https://www.juniper.net/us/en/products-services/application-management-orchestration/appformix/>
 - Data sheet, solution briefs, demo video, demo request, etc.
- https://www.juniper.net/documentation/en_US/appformix/information-products/pathway-pages/index.html
 - User guide, software download, support, etc.

RECAP – APPFORMIX PROVIDES...

- Cross-layer network discovery and visualization
- Comprehensive monitoring and correlation of physical and virtual network infrastructure and resources
- Scalable, real-time visibility and alarms
- Machine-learning and adaptive analysis
- Optimized network performance, resiliency, scalability, economics and responsiveness through event-driven automation and orchestration



Q&A