

Intent Driven Network Operations with AppFormix Advanced Analytics Platform

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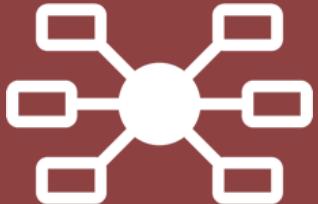
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DURING THIS SESSION: YOU WILL BE ABLE TO...

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

CHALLENGE

Data Collection and Analysis



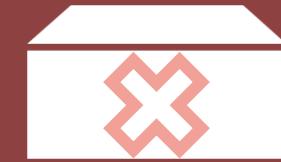
LARGE # OF HETEROGENEOUS HARDWARE & SOFTWARE COMPONENTS

- 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

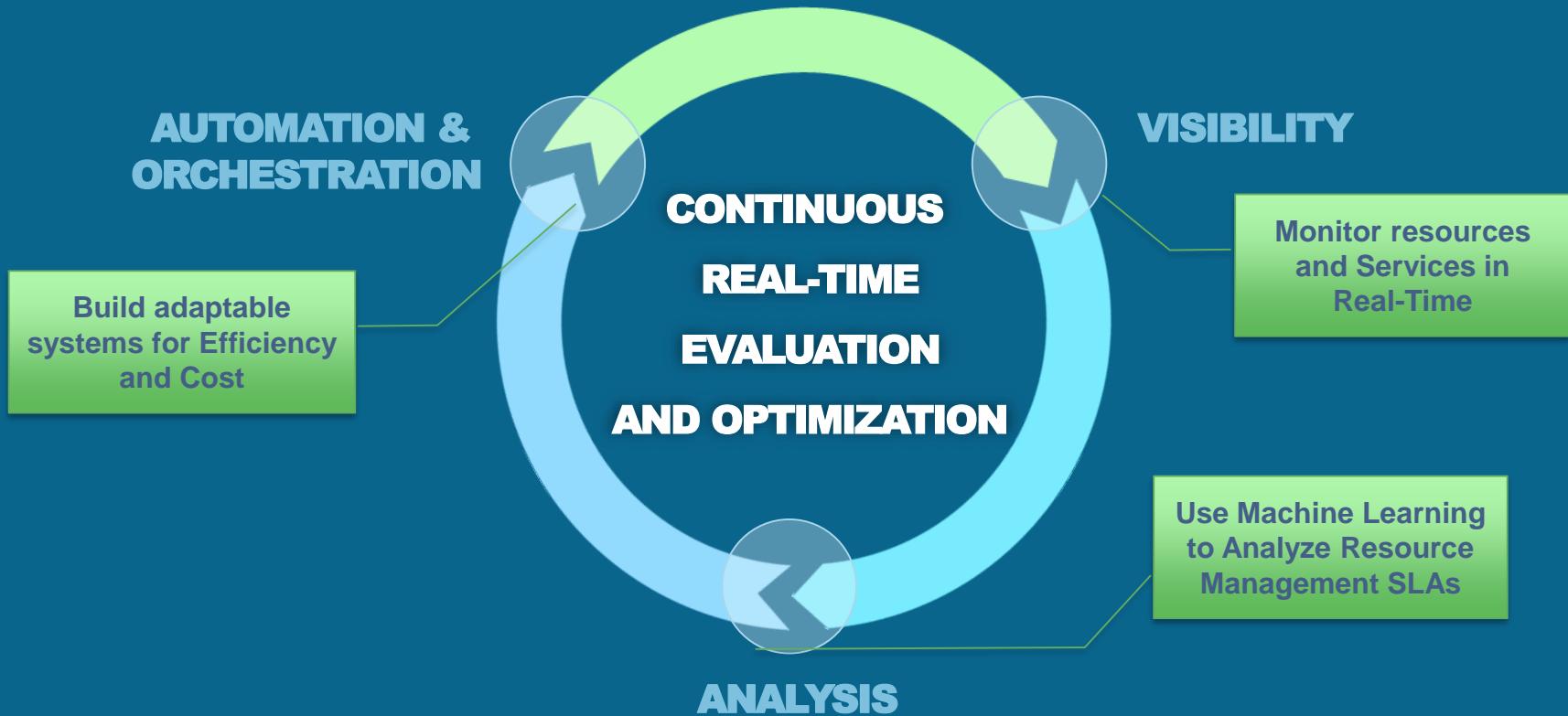
- Multiple data sources generate large amount of data
- Real-time management and monitoring of large & disparate data sets requires complex data, network and storage management tools



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



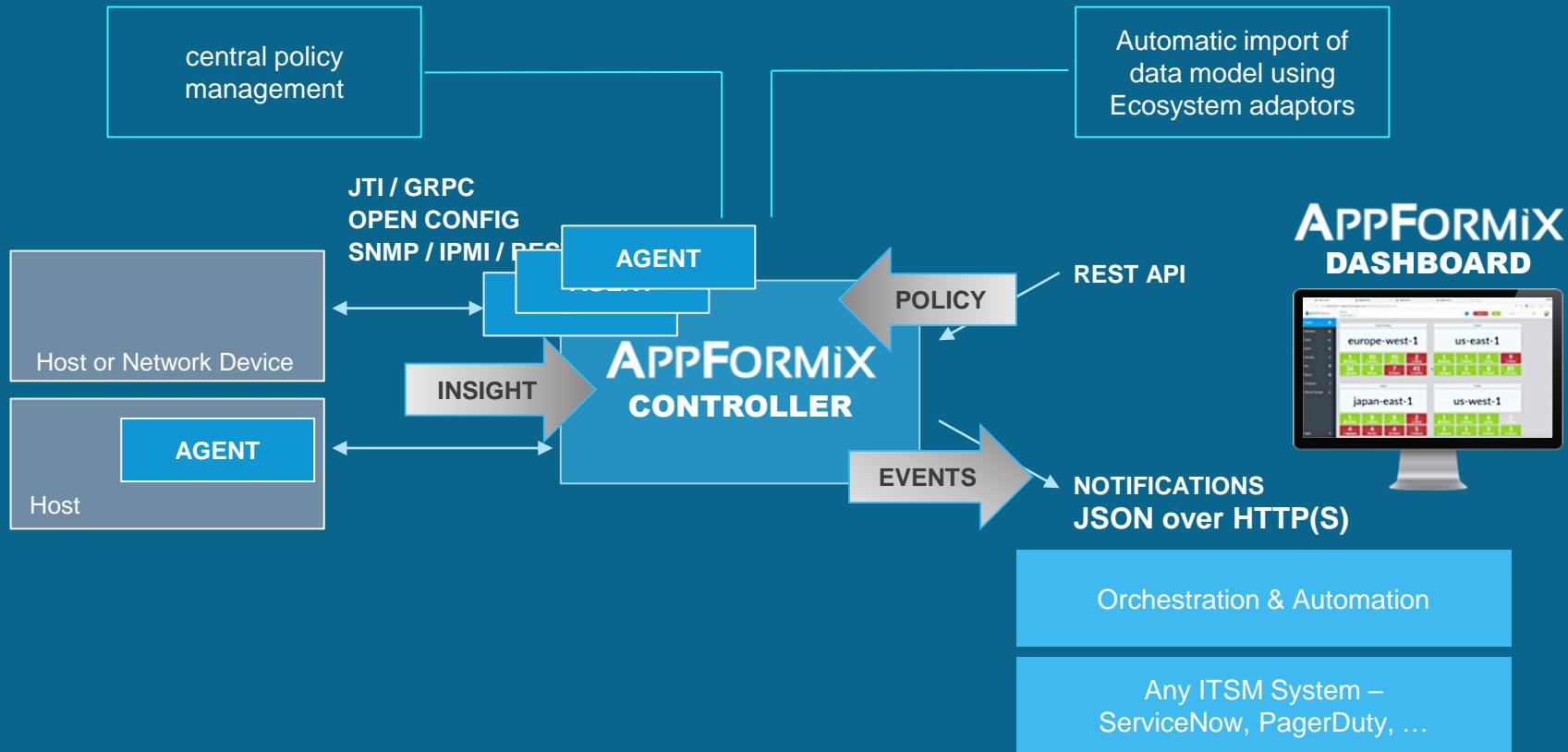
SOFTWARE DEFINED INFRASTRUCTURE



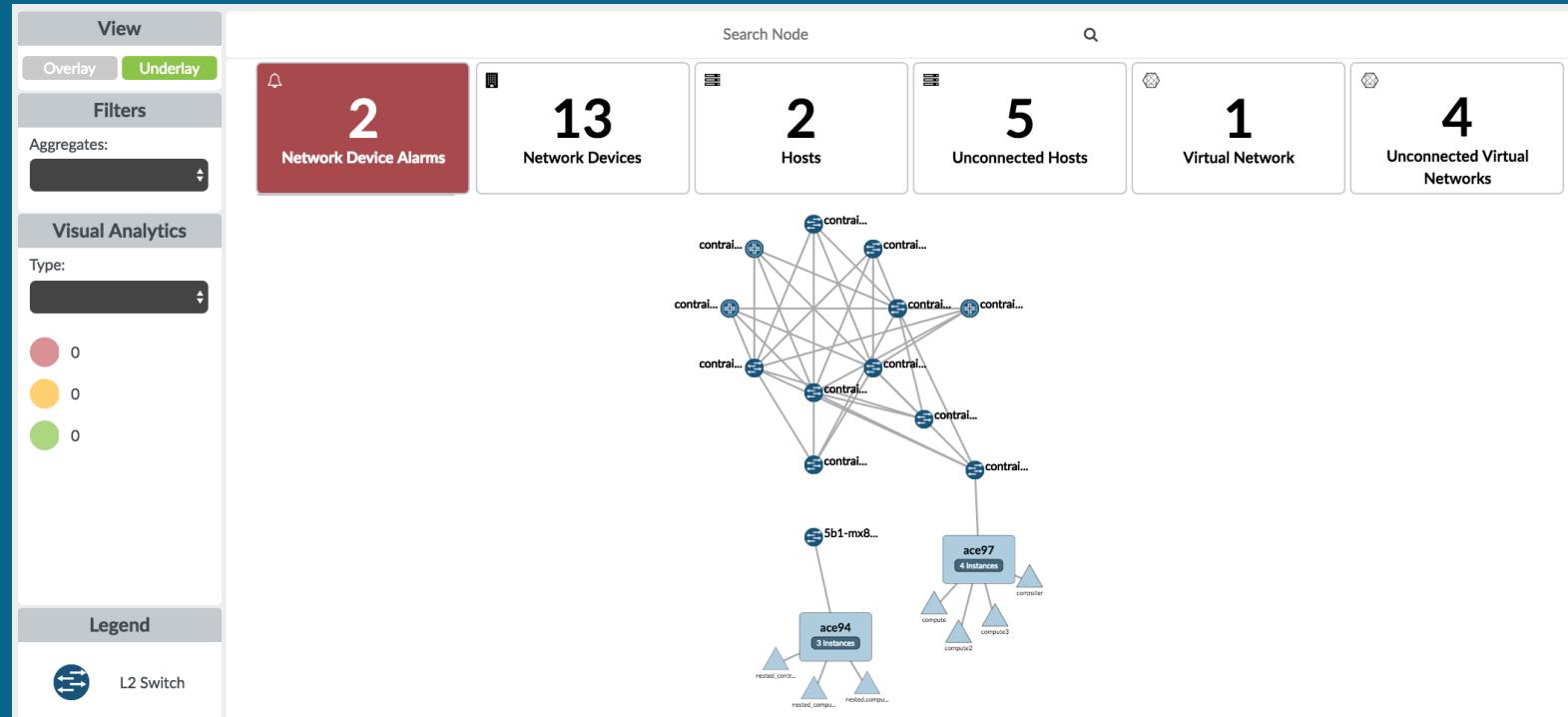
PHYSICAL INFRASTRUCTURE



APPFORMiX ARCHITECTURE

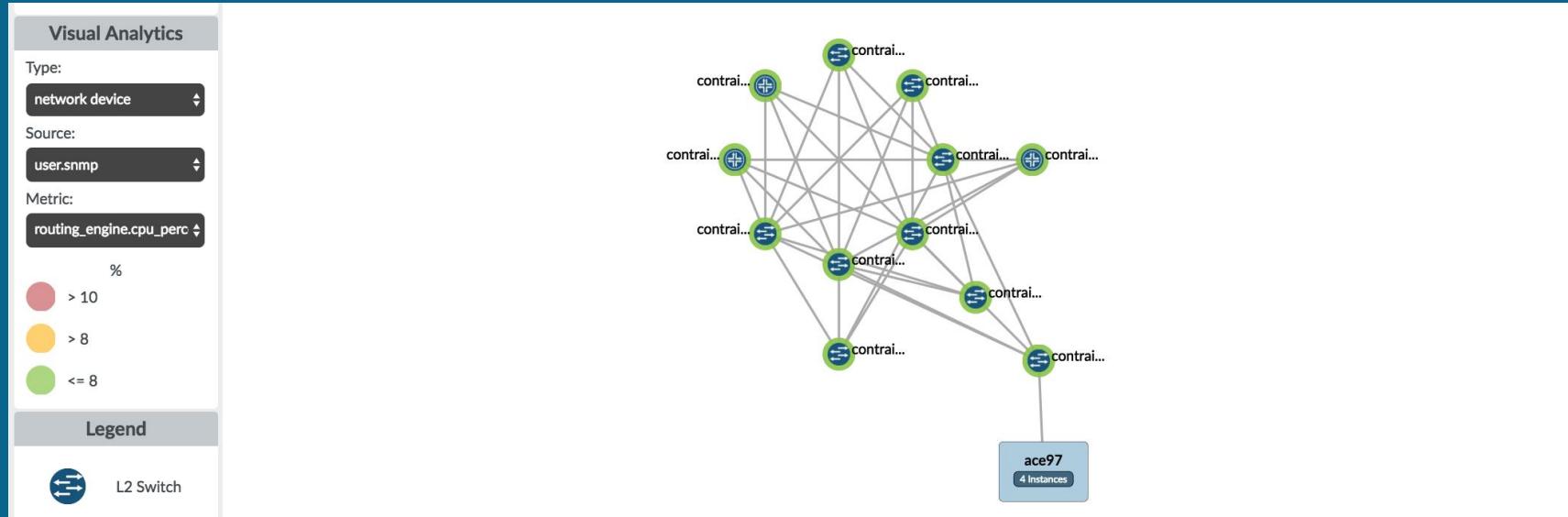


NETWORK TOPOLOGY - UNDERLAY



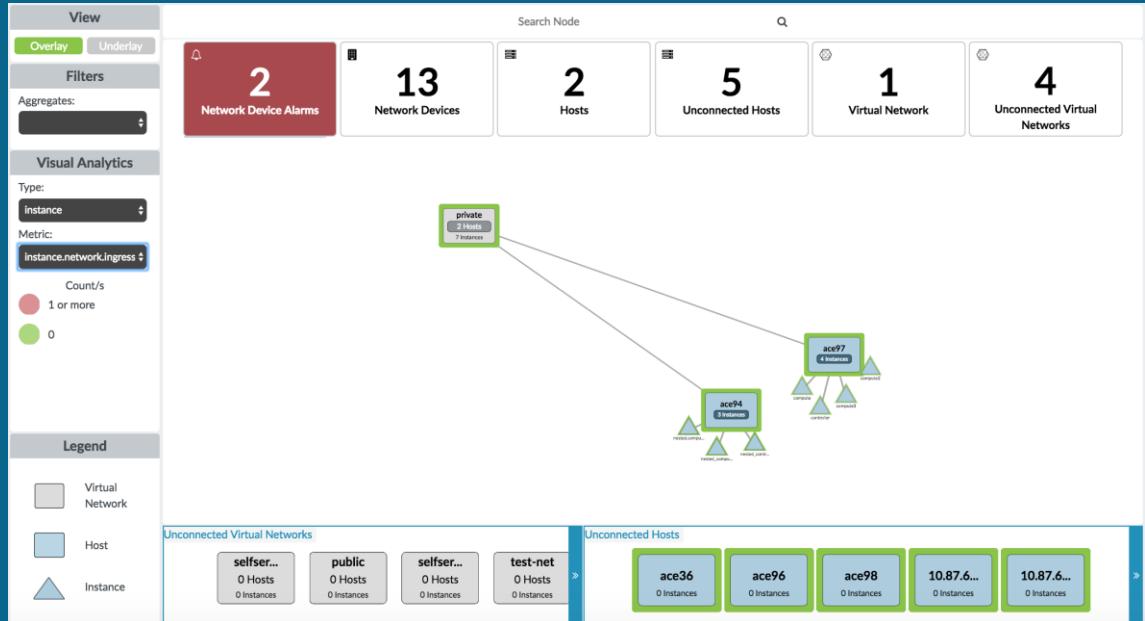
NETWORK DEVICE HEATMAP

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

		13		0		0		13	
		Total	Bad	Risk	Good				
Resource	View	Health	Risk	Management IP	Node Type	Switch Type	Source	Description	
5b1-mx80-1...				10.87.68.120	physical-router		user,rti		
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		
contrail-q...				10.102.44.8	physical-router		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
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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.

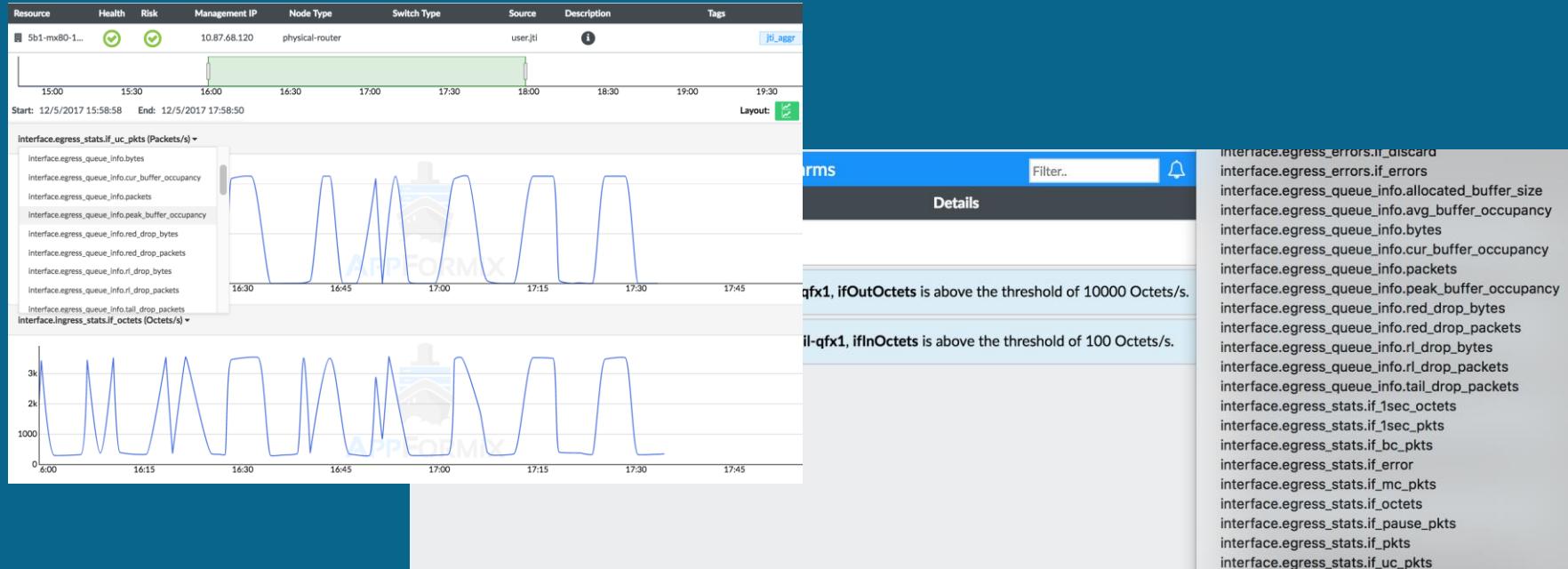
NETWORK TELEMETRY

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-ovewview.html

ANALYZING JTI METRICS

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



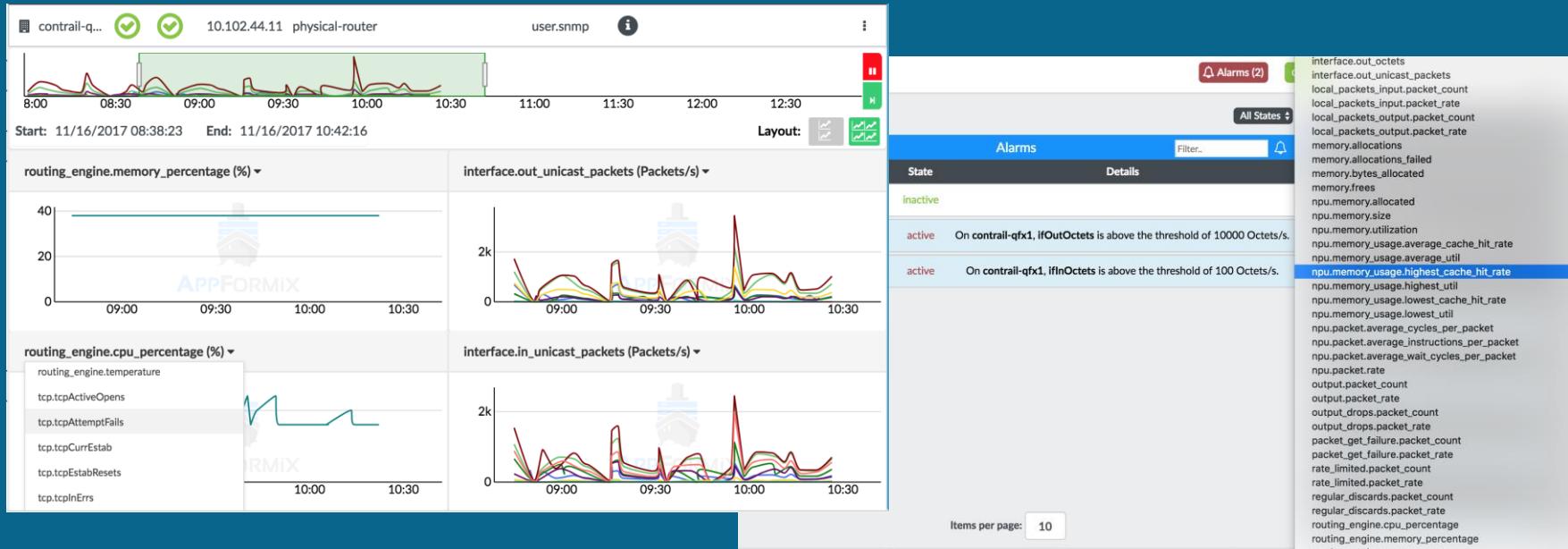
SNMP-BASED MONITORING

Monitor network devices via SNMP

The screenshot shows the 'Network Device Settings' interface. On the left, a sidebar lists various settings: AppFormix Settings, Services Settings, Notification Settings, SLA Settings, Oversubscription, Plugins, Network Topology, Network Devices (which is selected and highlighted in blue), and About. The main content area is titled 'Network Device Settings' and contains tabs for 'SNMP Devices' (selected) and 'JTI Devices'. Under the 'SNMP Devices' tab, a section titled 'Configured SNMP Devices' lists 'contrail-qfx1'. Below this, a table titled 'MIBs' lists several MIBs with delete icons: IF-MIB::ifTable, IF-MIB::ifXTable, TCP-MIB::tcp, APPFORMIX_ROUTING_, and enterprises.2636.3.1.13.1. At the bottom of this section are buttons for '+ Add MIB' and 'Update MIBs'. Below this table, a list of unconfigured devices includes 'contrail-qfx10', 'contrail-qfx11', and '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

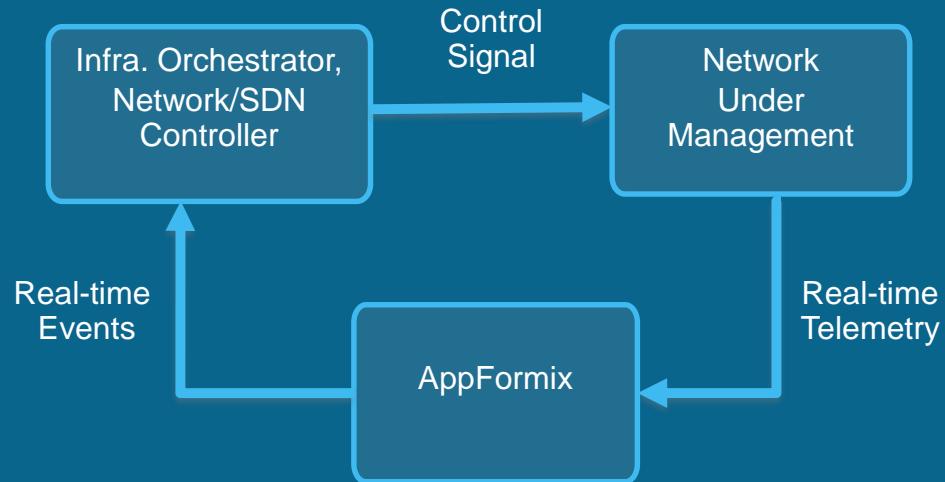
- Machine-learning to determine baseline value
 - Value of “normal” is variable
- User configures acceptable deviation from baseline
- Detect and alarm on sudden spikes and Anomalies



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
