MULTI-CLOUD VISIBILITY AND OPERATIONS WITH APPFORMIX ANALYTICS

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“INTENT-DRIVEN CLOUD”

AUTOMATION & ORCHESTRATION

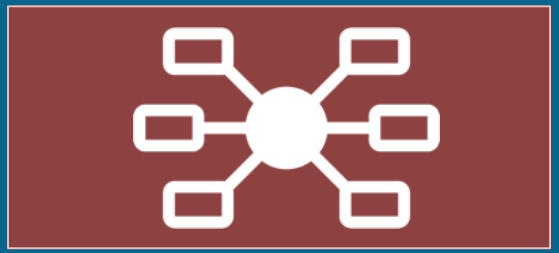
VISIBILITY

ANALYSIS

AppFormix

CLOUD OPERATIONS CHALLENGES

Visibility and Analysis

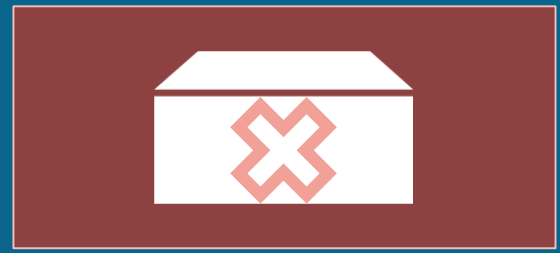


DYNAMIC ENVIRONMENTS OF HETEROGENEOUS HARDWARE & SOFTWARE COMPONENTS

- Large # of heterogeneous, fragile & interconnected hardware and software components → make it a challenge to run cloud at scale
- Components come and go dynamically in software-defined, cloud-native environments

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 / storage management tools



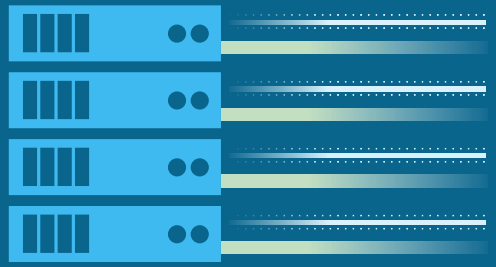
NO OUT-OF-THE BOX SOLUTION

- Legacy tools were not built for cloud-native environments, and to correlate across layers of the physical and virtual infrastructure
- Open-source based tools require significant customization

PROBLEM:

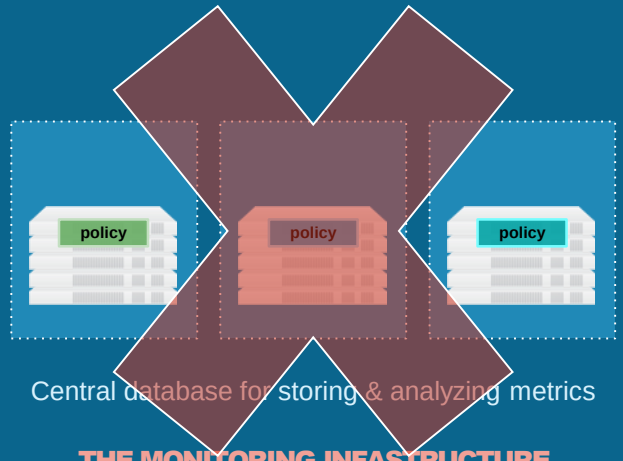
Monitoring technologies are SLOW! INNEFICIENT! INEFFECTIVE!

INEFFICIENT REQUEST-RESPONSE



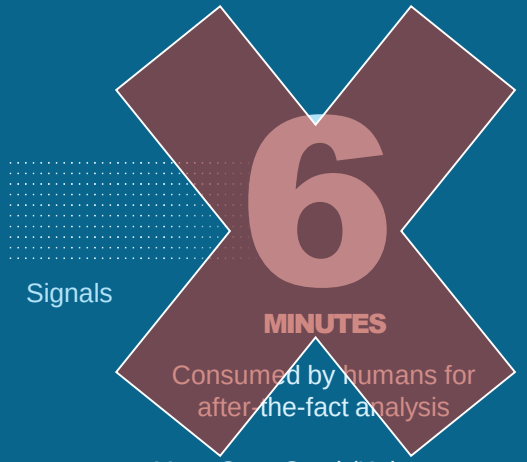
Compute & Storage Infrastructure

Metrics



Central database for storing & analyzing metrics

THE MONITORING INFASTRUCTURE IS MORE COMPLEX THAN THE INFRASTRUCTURE THAT IS BEING MONITORED



Signals

Consumed by humans for after-the-fact analysis

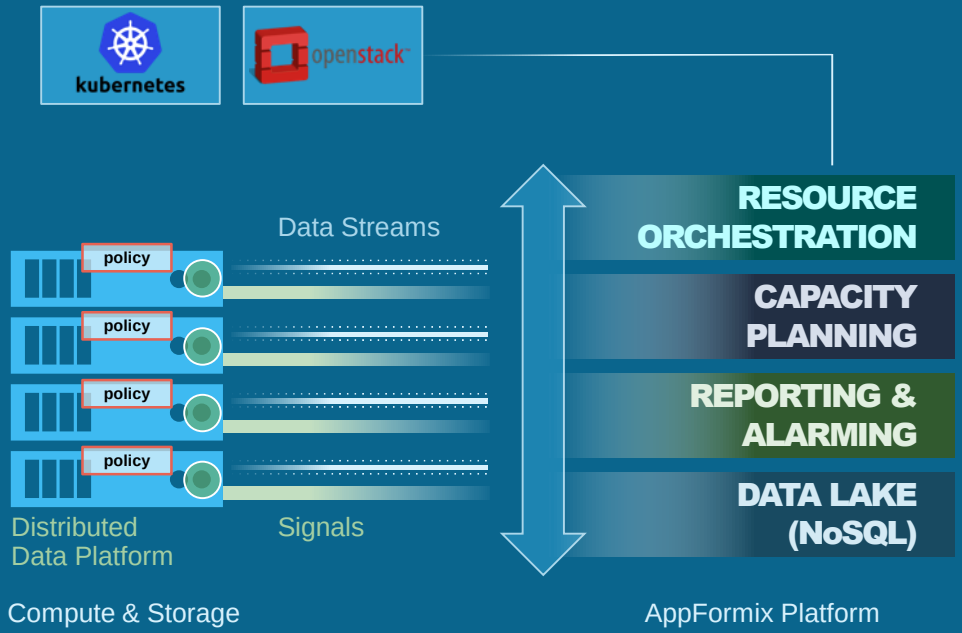
Your OpenStack/Kubernetes

NEED REAL TIME

TOO SLOW TO INFLUENCE ORCHESTRATION

APPFORMIX – DISTRIBUTED STREAM ANALYSIS & OPTIMIZATION

Fast! Efficient! Responsive!



ACTIONABLE SLA MONITORING

- Notifications to external orchestration systems
- Enhanced, state-based scheduling according to resource management SLA

CONTINUOUS ANALYSIS OF METRICS

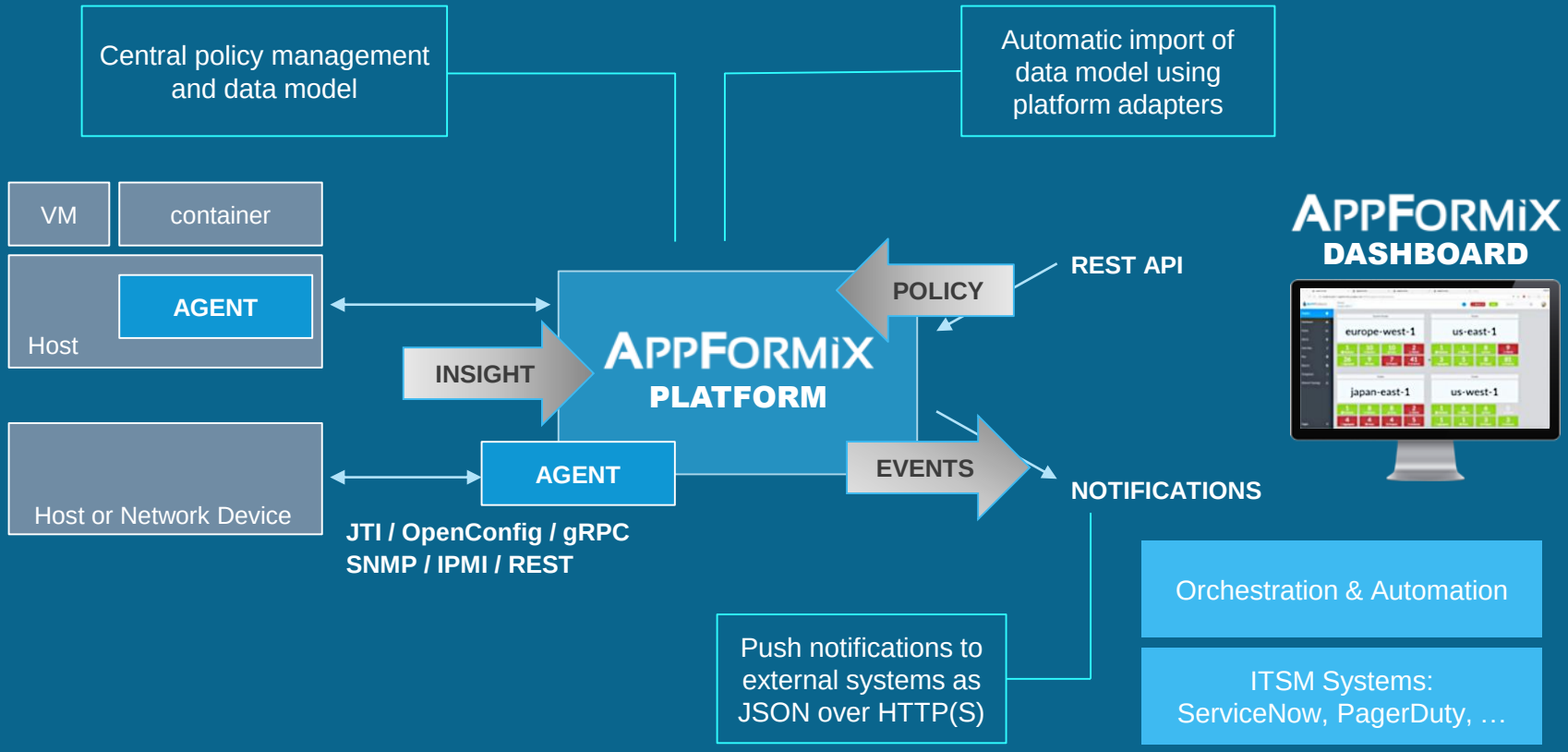
- Analyze more metrics
- Faster prediction of failures

SOLUTION SCALES WITH YOUR INFRASTRUCTURE

- Distributed stream-based analysis
- No central choke-point!

REAL TIME

APPFORMIX ARCHITECTURE




VISIBILITY

CROSS LAYER VISIBILITY

Stream-based analysis for responsive SLA monitoring and fault detection

Machine learning for adaptive monitoring

AppFormix

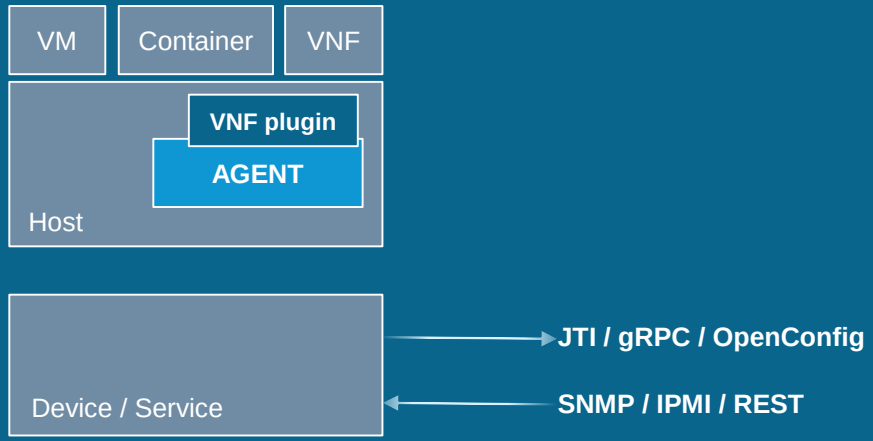
Reactive and proactive orchestration to improve efficiency and service availability

Data-driven capacity management

Single operations platform to monitor all layers of the infrastructure

APPLICATION & SERVICES	CLOUD INFRASTRUCTURE	SOFTWARE DEFINED INFRASTRUCTURE	PHYSICAL INFRASTRUCTURE
cassandra, MySQL, docker, RabbitMQ, mongoDB, redis, NGINX	Microsoft Azure, amazon web services, Google Cloud Platform	openstack, vmware, kubernetes, ScaleIO, ceph, OPENCONTRAIL	

VISIBILITY – EXTENSIBLE MONITORING



VNF monitoring via **extensible** plugins

metrics analyzed by AppFormix for alarms and SLAs

"Smart Agent"
Physical Layer, Host OS, Virtual Layer, Containers, Apps

Agentless
Physical and Cloud Infrastructure Monitoring

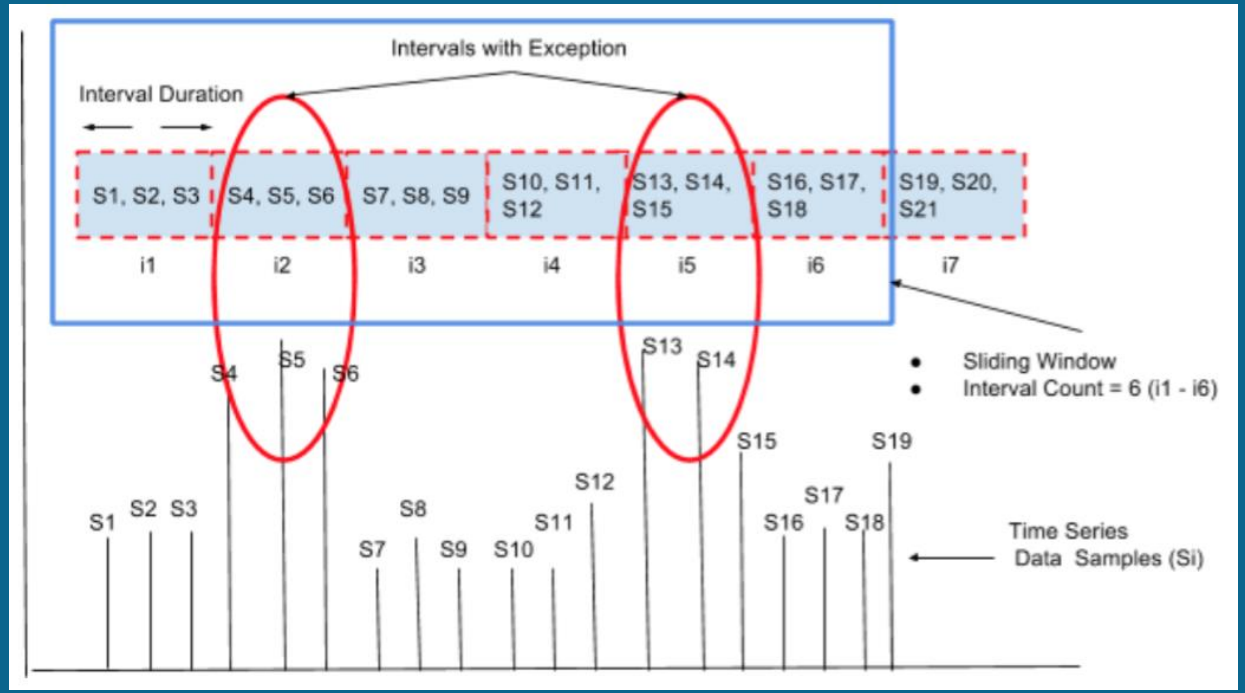

ANALYTICS

APPFORMIX ALARMS

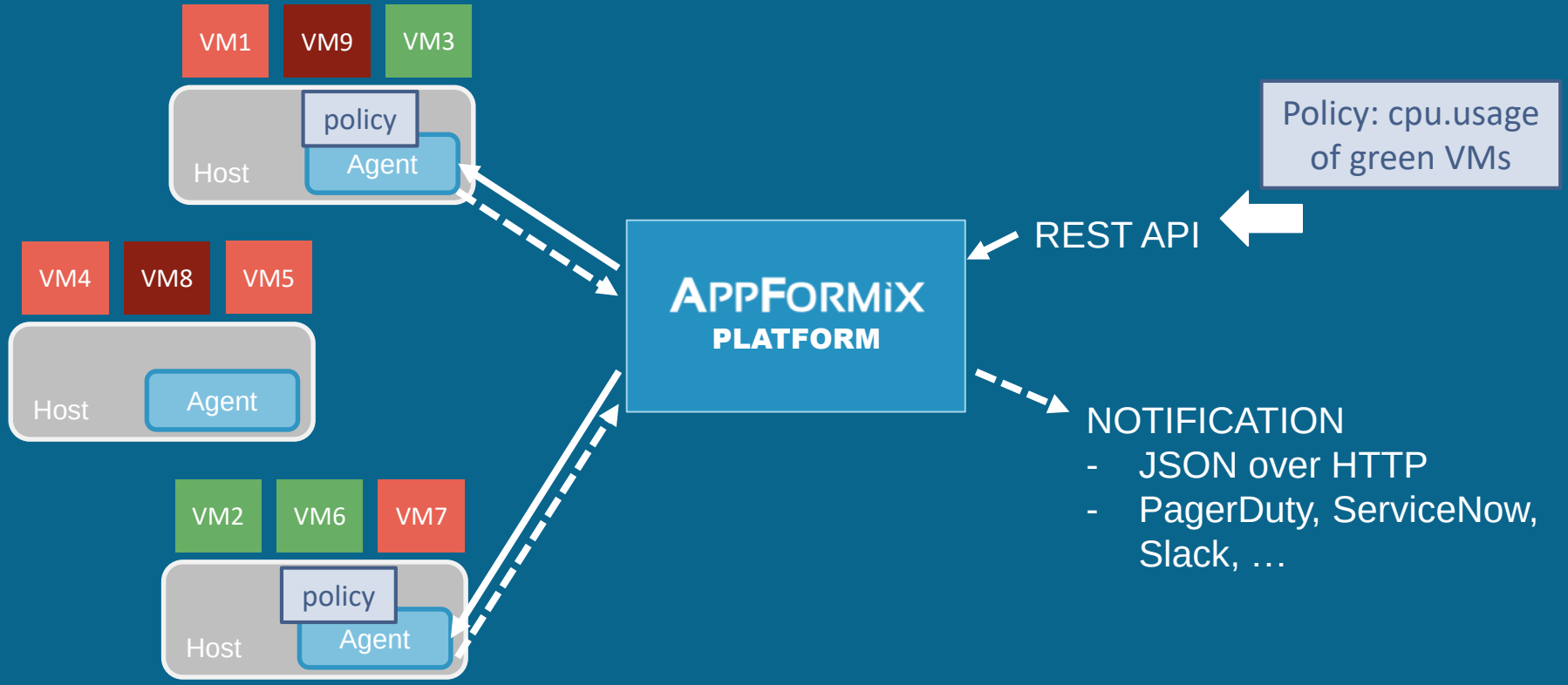
- Defines a monitoring rule for a single metric over a set of entities
- User-defined interval with per-second granularity
- Agent evaluates alarm using streaming analytics as metrics are collected
- May be configured for various system and workload entities
  - Service (OpenStack services, Contrail, Ceph, ScaleIO, VMware services, etc.)
  - Instance (Virtual Machine, container)
  - Host
  - Network device

ALARMS – SLIDING WINDOW

- Powerful controls to configure streaming analysis.
- Detect fine-grained spikes that may be hidden in per-minute averages.



ALARMS – DISTRIBUTED ANALYSIS



STATIC & ADAPTIVE THRESHOLDS

Machine Learning for Adaptive Baseline

STATIC THRESHOLD	DYNAMIC ADAPTIVE THRESHOLD
User-provided threshold	Threshold determined by machine-learning and continuously updated
Best for well-understood performance profiles with absolute or constant boundaries	User-provided sensitivity above or below learned threshold
Examples: packet drops, interface flaps, CPU temperature, disk usage	Moving average can detect sudden changes
	Per-hour baseline for time-varying workloads

SLA POLICY

- Combine multiple Alarms to define performance bounds for a set of entities: hosts, instances, services
- AppFormix continuously monitors whether entities are compliant with the SLA
- Multiple SLA types may be defined: Health, Risk, Scheduling
- Notification when SLA state changes for an entity
- SLA state can be checked at any time in Dashboard or REST API

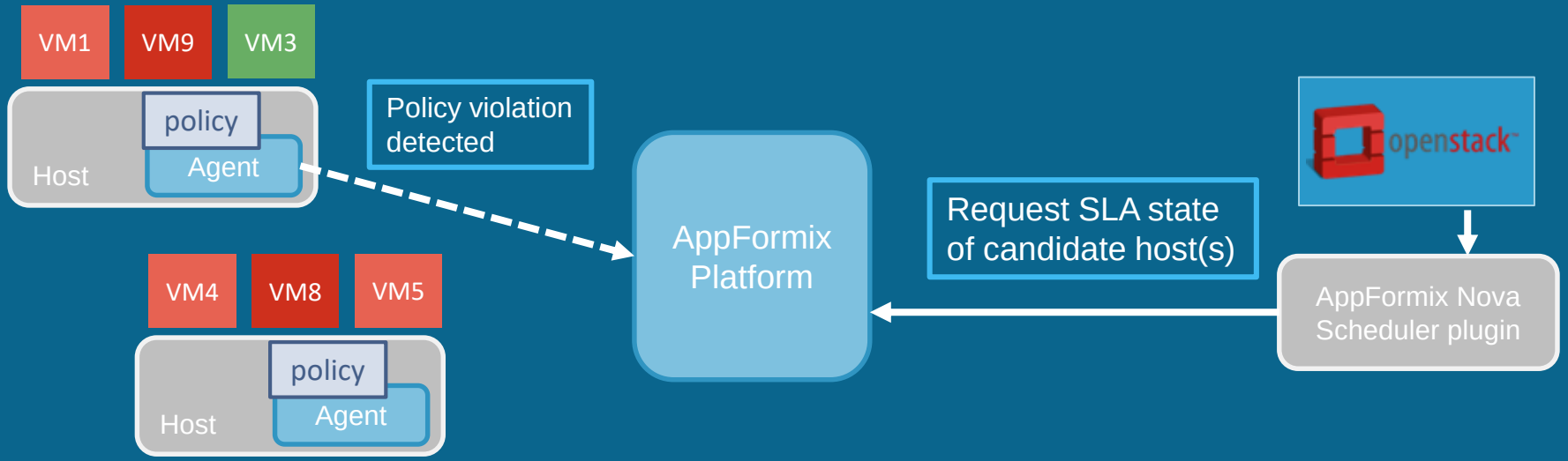

AUTOMATION &
ORCHESTRATION

STATE-DRIVEN AUTOMATION

- User may configure external notification for SLA violation or Alarm
- Prevent service disruption based on adaptive learning, by automatically executing a mitigation action
- Example: Auto-scale VNF based on load of existing VNF instances

STATE-DRIVEN ORCHESTRATION

- Proactively ensure real-time, optimal overall system and workload performance
- Improve scheduler by considering real-time state of the NFVi
- Example: Influence placement based on real-time resource management SLA




DEMONSTRATION

DEMO USE CASES

- Visualization across layers of the infrastructure
- View resource capacity for new or expanding services
- Maximize infrastructure ROI using reports and chargeback
- Improve service availability and performance with actionable insights
- Improve reliability with state-driven workload placement

APPFORMIX

Operations tools for the DevOps Era

IT AUTOMATION

DEVOPS READY

OPERATIONS ANALYTICS

Stream Analysis for real-time risk analysis

STATE-DRIVEN ORCHESTRATION

Prevent Service Disruptions

DATA-DRIVEN CAPACITY PLANNING

Enhance reliability and improve your cloud ROI

ROLE-BASED MONITORING & ALARMS

Empower your users with Role Based GUIs and APIs

BILLING & REPORTING

Showback and Chargeback

vmware

openstack

kubernetes

amazon web services

Microsoft Azure

PHYSICAL AND SOFTWARE DEFINED INFRASTRUCTURE