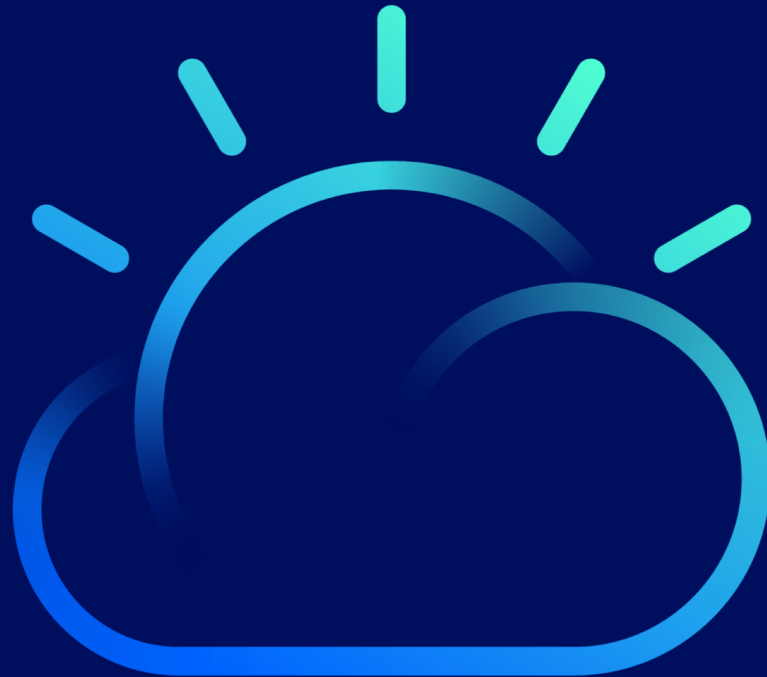


Netcool Operations Insight (NOI) - Network Performance Insight (NPI) v1.2.3

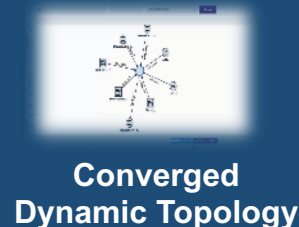


Use-Cases Demo



Krishna M. Kodali –Sr. Software Engineer - IBM
- kmkodali@us.ibm.com

IBM Netcool Operations Insight



**Powered by the Proven value
of Netcool OMNibus**

**Flexible, Mobile-Ready
Dashboards for Managed
Communications**

**Accelerated with Innovative
Cognitive Analytics for
Efficiency and Agility**

**Easily Extend across all IBM
and 3rd party solutions for
broadest management
available**

**On Premises
Cloud
Hybrid**



End Users



Devices



Web Servers



App Servers



Databases



Storage



Network

Core Functionality

- Advanced IT Event Correlation and Analysis
- Event Analytics
- Log Search Analytics
- Event Enrichment
- Common UI for dashboards

Available Features:

- Network Discovery and Root Cause Analysis
- Network Configuration Automation and Audit
- Network Performance Management
- Agile Service Manager

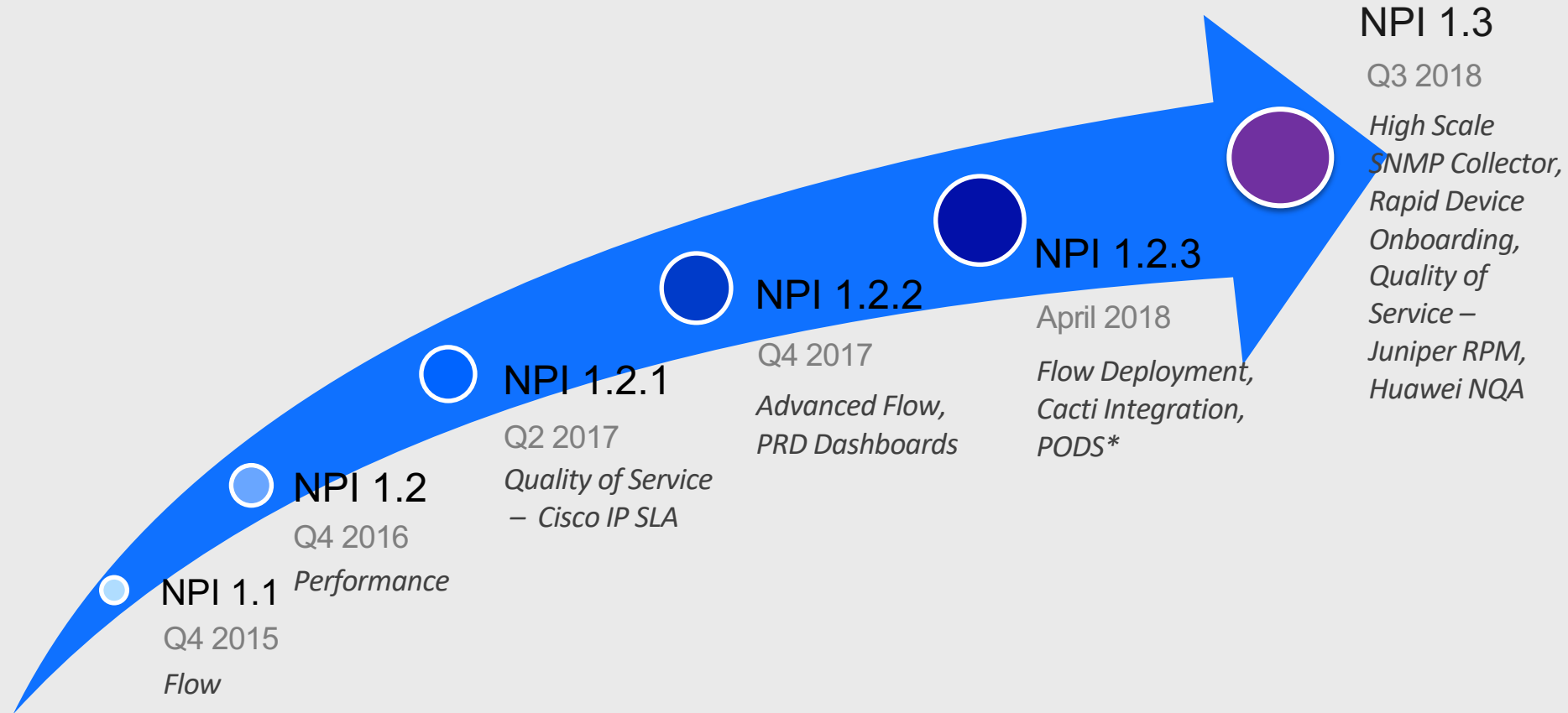
**Optionally extend
for Proactive
Operations**



Agenda:

- ITNM & NPI – Quick Overview
- Integration walk-through
- Use-Cases Demo
- Q & A

NPI Evolution



Version Compatibility Chart at <https://ibm.biz/BdYxNK>

* PM OOTB Device Support (PODS)

Capabilities in NPI (since NOI v1.4.x)

- UI: Introduction of new performance dashboards for the network SME persona based on Persistent Responsive Dashboard (PRD): Network Performance Overview, Network Traffic Overview, Extensive Flow-related Reports and On-Demand Device Performance Report
- Analytics: Dynamic deviation analytics that highlight devices which are behaving badly compared to past performance (historical)
- Integration: Out of the box integration with Cacti
- Scalability: **Introduction of new High Scale Collector – SNMP**, to meet the needs of enterprises with thousands of devices to monitor
- Flow: Advance flow analytics supporting Cisco AVC such as NBAR2 for application recognition, ART for application response time and Queue Drop for QoS, monitoring via IP Groups and PR-SCTP transport protocol in addition to UDP for reliable transmission of flow
- SNMP: **Introduction of Rapid Device Onboarding capability** to allow users to configure the collection of performance metrics of new SNMP device types plus Performance Management OOTB Device Support (PODS) for Cisco, Juniper and Huawei devices
- IP SLA: In addition to Cisco, support is **extended to Juniper RPM and Huawei NQA**
- **Deployment Flexibility**: The option to install NPI for Flow only deployment without pre-requisites of NOI Operations and Network Management
- Platform Support: NPI Hadoop stack now is based on **Hortonworks Data Platform (HDP)**

NPI Value Propositions

Performance Management solution that delivers seamless contextualized insights

Enterprise Challenges

Lack of Visibility

Network Use of Cloud-Centric Applications

User complains that Outlook email synchronization is slow.

Lack of Visibility

User Experience: Applications & VoIP Network Services

User complains poor VoIP quality

NPI Benefits

Expose

Use of bandwidth consuming applications and users

*NPI analyzes the application traffic bandwidth consumption:
NPI exposes other applications (NetFlix, YouTube) competing with Outlook for Internet bandwidth.*

Possible remedies: Either increase bandwidth or review device QoS policy

Isolate

Network causes of applications latency

NPI identifies delay contribution of each segment – LAN, WAN, Application Server.

Possible remedies for LAN and WAN: Review device QoS policy

Assess

Impact of network traffic load on overall quality latency sensitive service

*NPI reports the quantitative value of Voice Quality:
If MOS value is low (poor), then it confirms the link quality is poor.
If MOS value is high (good), then the cause is not link-related.*

Validate

Effectiveness of network QoS policy

*NPI assesses the VoIP traffic is being prioritized (ToS) correctly with sufficient bandwidth (queue drop monitoring). **Possible remedy:** apply device QoS policy*

Flow Monitoring with Network Performance Insight (as from v1.2.2)

See what is consuming network bandwidth and the traffic flowing across the network, integrated with Network Manager for aligned topology and custom device & interface names

Flow See what is consuming network traffic resources

- Supports 30k fps per commodity node on 1000 interfaces.
- Clustering of multiple nodes for unmatched scalability
- Pre-processed and custom aggregation of flow data, including Application, ToS, Protocol, Source IP, Destination IP, Conversations and Autonomous Systems
- Threshold alerts
- Support Cisco AVC (NBAR2, ART and QoS Queue Drops)
- Support Bandwidth Usage monitoring by IP Groups
- Support PR-SCTP protocol in addition to UDP for reliable transmission of flow

Flow formats	Vendor	Versions	Traffic types	Protocols
NetFlow	Cisco	1, 5, 9	IPv4 IPv6	ssh
J-Flow	Juniper	5, 9		ftp
cflow	Alcatel	5, 9		telnet
NetStream	Huawei	5, 9		smtp
IPFIX	Industry standard	X		snmp
				http
			

Quickly see what is consuming network traffic resources

NPI Architecture

With Micro Services for Flexible Deployment Configurations

Landing Page for
Operations Manager,
On-Demand Filtering
Reports

IBM DASH
For Operations
via Device Dashboard

UI
Service

NPI Performance
Dashboard

Apache Spark Analytics Services

Flow
Aggregation

Entity Aggregation &
Threshold Violation

Storage Service
(Storage, Query, Federation)

Apache Hadoop
Distributed File System

DNS
Service

Event
Service

Kafka Message Bus

Adv. Flow Collector
Service

SNMP Discovery
Service

Polled Data
Service

NCIM
Service

SNMP Collector
Service

Formula
Service

Cacti
Service

NetFlow v9
(including Flexible
NetFlow (FNF) and
Cisco NBAR2) and
IPFIX

Flow

ITNM Collector

IP SLA

Network Manager
Poller

Network Manager
(NCIM)

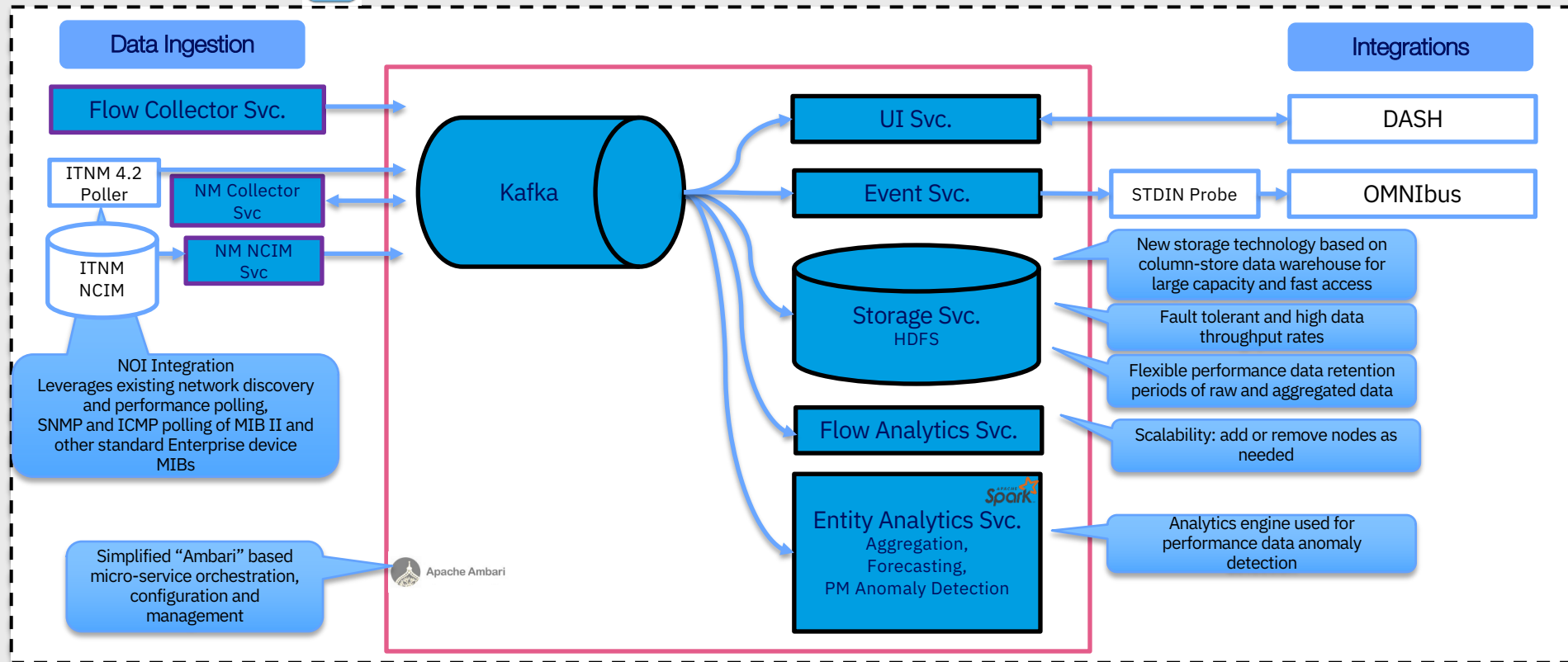
Cacti



Extend storage of Snmp Performance Raw Data Using NPI Integration



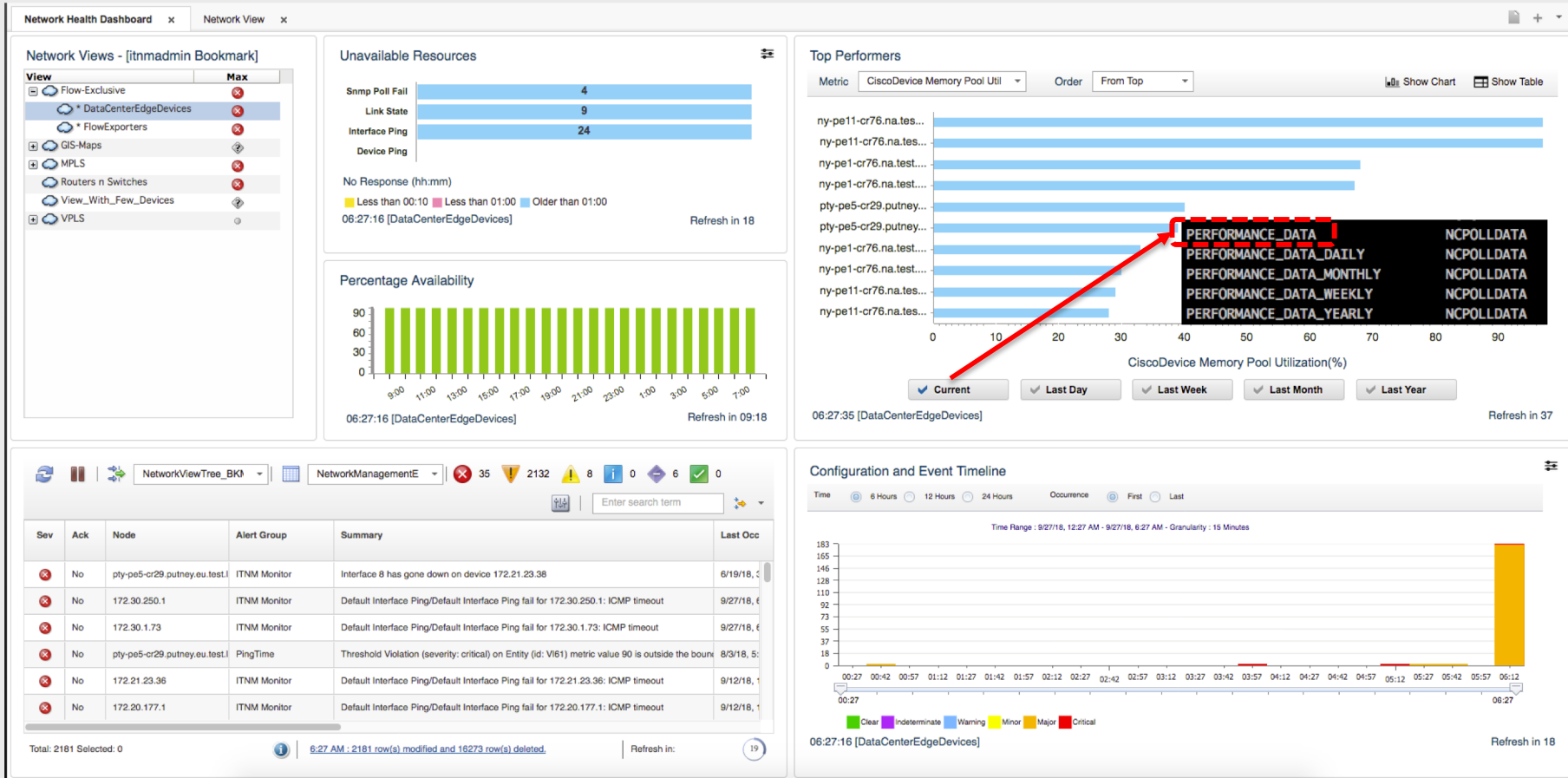
ITNM ↔ NPI – New Microservice Architecture (Data Flow)



Integration with NPI brings two key new capabilities

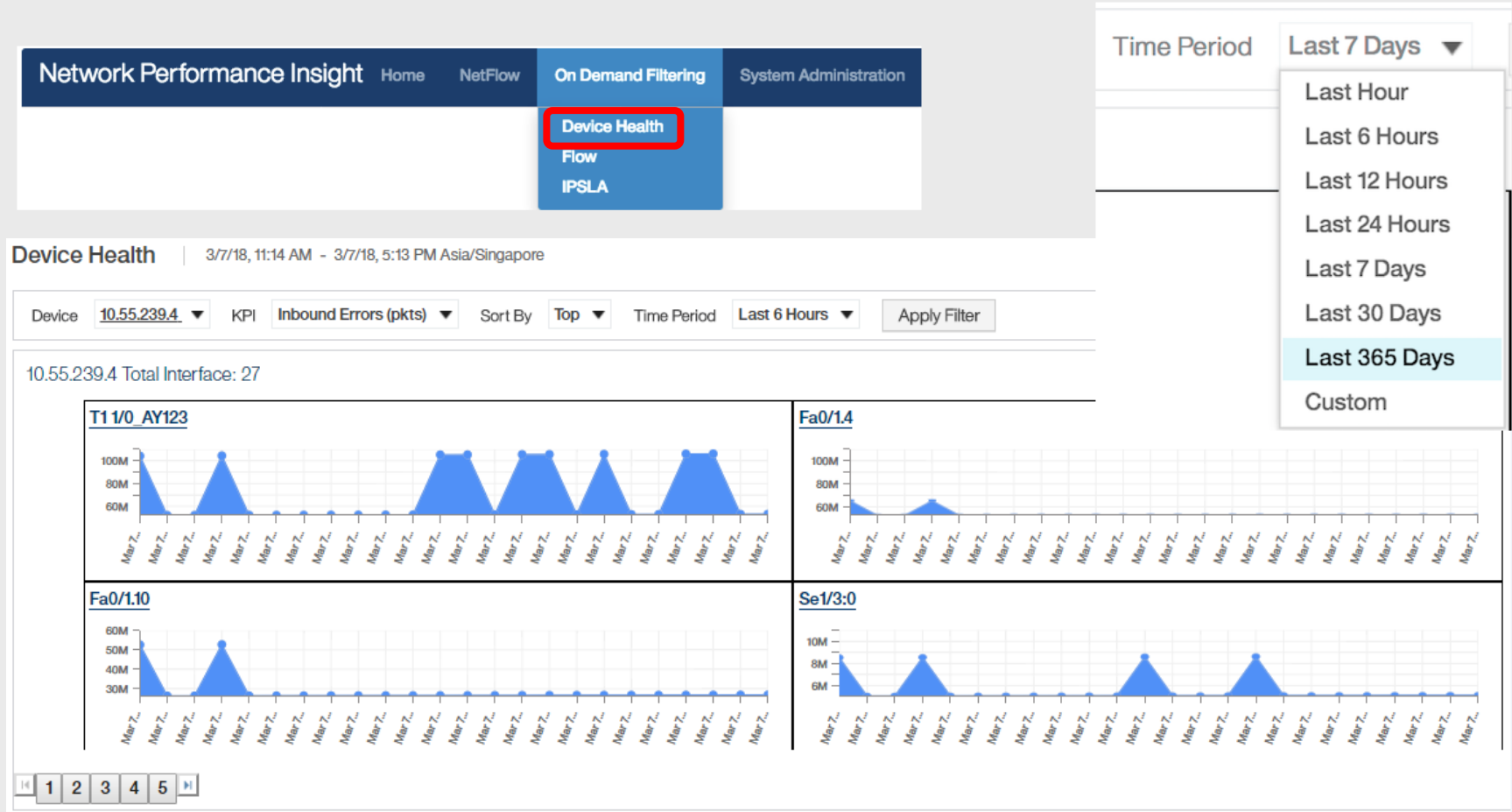
- 1 – Extending storage of Performance metrics for Anomaly Detection.
- 2 – Flow

Historical Data with-in Network Health Dashboard (NHD)



➤ More about EWMA is at <https://ibm.biz/BdYp3Q>

Historical Raw Data with-in NPI (Device Health) – 365 days



What is Flow ?

Network flow records

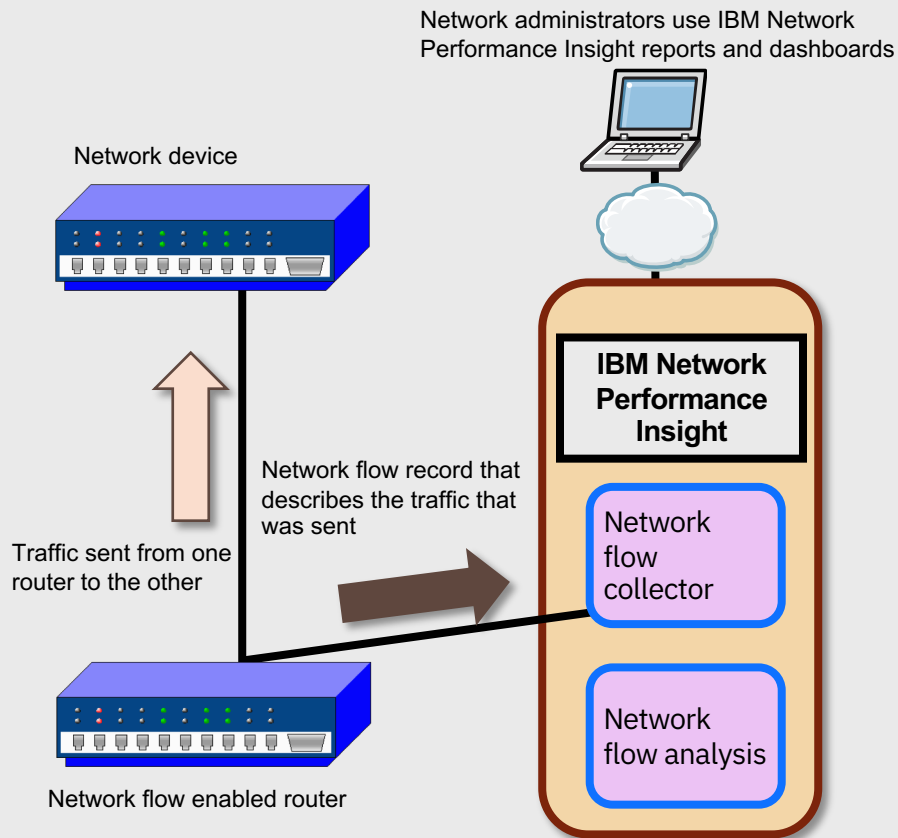
A network flow record is data generated by a network device, such as a router or switch

The data in a network flow record describes the network traffic that has passed through the router or switch


Network devices that have network flow enabled send their network flow records to a collector


IBM Network Performance Insight collects these flow records, analyzes them, and stores them



IBM Network Performance Insight users get reports and dashboards to help them understand the traffic on their network






Flow Enabled Devices & Interfaces

- Navigate from 'Console Integrations'  -> NPI -> System Configuration



Flow Devices ×		
Flow Devices		
Configure SNMP Credentials for each device		
 		
Exporter IP	Created Time	Enrichment State
172.20.161.5	9/14/18, 5:24 AM	NEW
172.20.162.110	8/1/18, 10:47 AM	NEW
172.20.177.1	8/29/18, 12:34 PM	NEW
172.30.135.1	9/5/18, 10:58 AM	NEW
172.30.233.11	8/29/18, 8:44 AM	NEW



Interfaces ×				
Flow Interfaces				
Configure the interfaces that should be monitored using flow data				
 				
Enabled	Interface	Speed(bps)	Direction	Actions
Yes	172.30.80.6-49	0	Egress	Edit Disable
No	pty-pe5-cr29.putney.eu.test.lab-Gi0/1	4294967295	Ingress	Edit Enable
Yes	rchmd-pe1-cr29.richmond.eu.test.lab-Gi0/1	1000000000	Ingress	Edit Disable
Yes	rchmd-pe1-cr29.richmond.eu.test.lab-Vi114	1000000000	Egress	Edit Disable
Yes	pty-pe5-cr29.putney.eu.test.lab-Vi61	1000000000	Ingress	Edit Disable
Yes	ny-pe11-cr76.na.test.lab-Gi1/25	100000000	Ingress	Edit Disable

E.g. of Flow Enabled Device Configuration & ITNM Device Structure

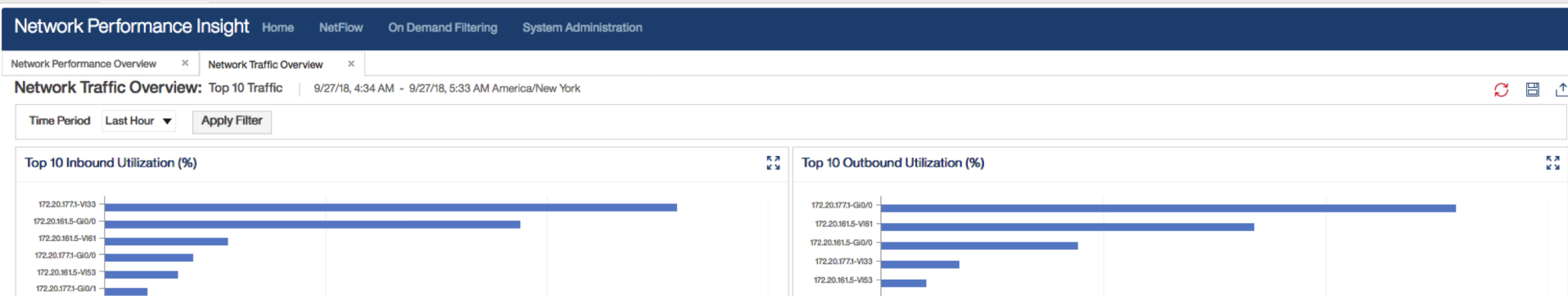
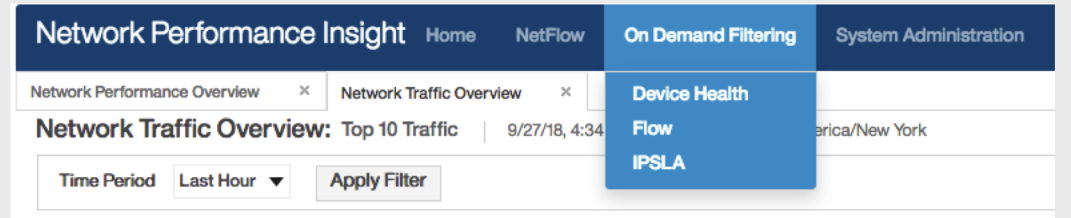
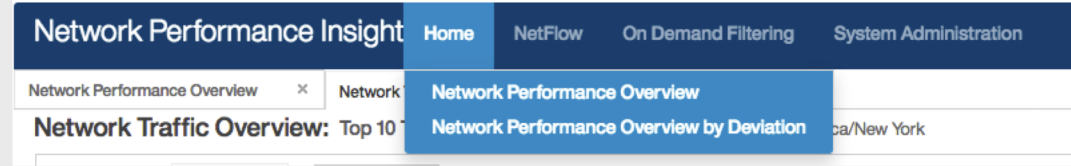
```
pty-pe5-cr29#show flow exporter
Flow Exporter Krishna:
Description:          flow exporter for Krishnas demo server
Export protocol:      NetFlow Version 9
Transport Configuration:
  Destination IP address: 172.20.161.5
  Source IP address: 172.20.161.5
  Source Interface: Loopback0
  Transport Protocol:  UDP
  Destination Port:    4379
  Source Port:         61231
  DSCP:                0x0
  TTL:                 255
  Output Features:     Not Used
Options Configuration:
  c3pl-class-table (timeout 600 seconds)
  c3pl-policy-table (timeout 600 seconds)
  application-table (timeout 600 seconds)
  application-attributes (timeout 600 seconds)
```

Component Path	
Chassis	
Component Detail	
Attribute	Value
ENTITYID	13026
ENTITYNAME	pty-pe5-cr29.putney.eu.test.lab
DISPLAYLABEL	pty-pe5-cr29.putney.eu.test.lab
MANUAL	0
FWREVISION	System Bootstrap, Version 15.0(1r)M16, RELEASE SOFTWARE (fc1)
HWREVISION	V06
MODEL	CISCO2901/K9
NAME	CISCO2901/K9
PARTNUMBER	CISCO2901/K9
RELATIVEPOSITION	-1
SWREVISION	15.4(3)M5, RELEASE SOFTWARE (fc1)
SERIALNUMBER	FCZ1731C599
CDMTYPE	2
PHYSICALINDEX	1
VENDORTYPE	1.3.6.1.4.1.9.12.3.1.3.804
CLASSNAME	Cisco29xx
UPTIME	317d 21h 4m 55s
SERVICES	datalink(2) network(3) transport(4) application(7)
INTERFACECOUNT	26
ISBEPFORWARDING	forwarding
ACCESSIPADDRESS	172.20.161.5
ACCESSPROTOCOL	IPv4

- Flow exporter must also be enabled on loopback along with interfaces

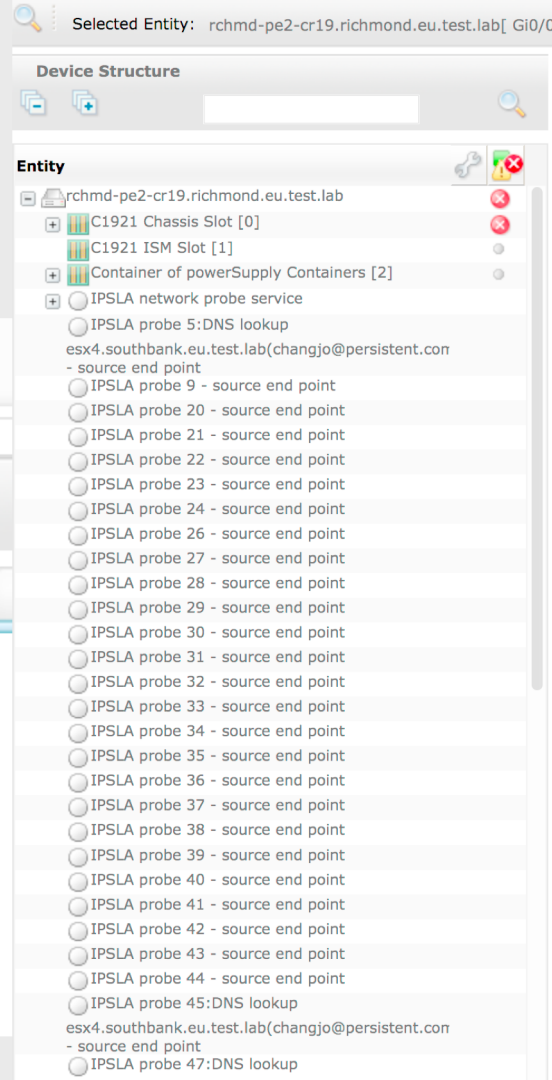
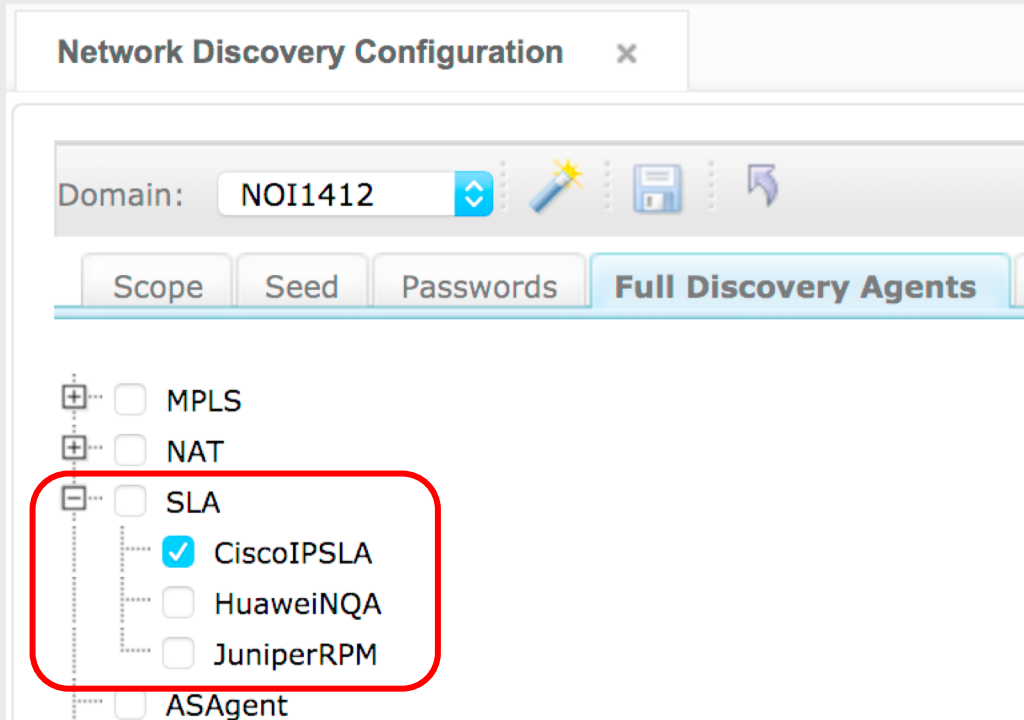
Dashboards reflecting Performance & Flow Data

- Network Performance Overview (Combination of SNMP Performance data and Flow)
- Network Traffic Overview (Flow)
- Flow exclusive

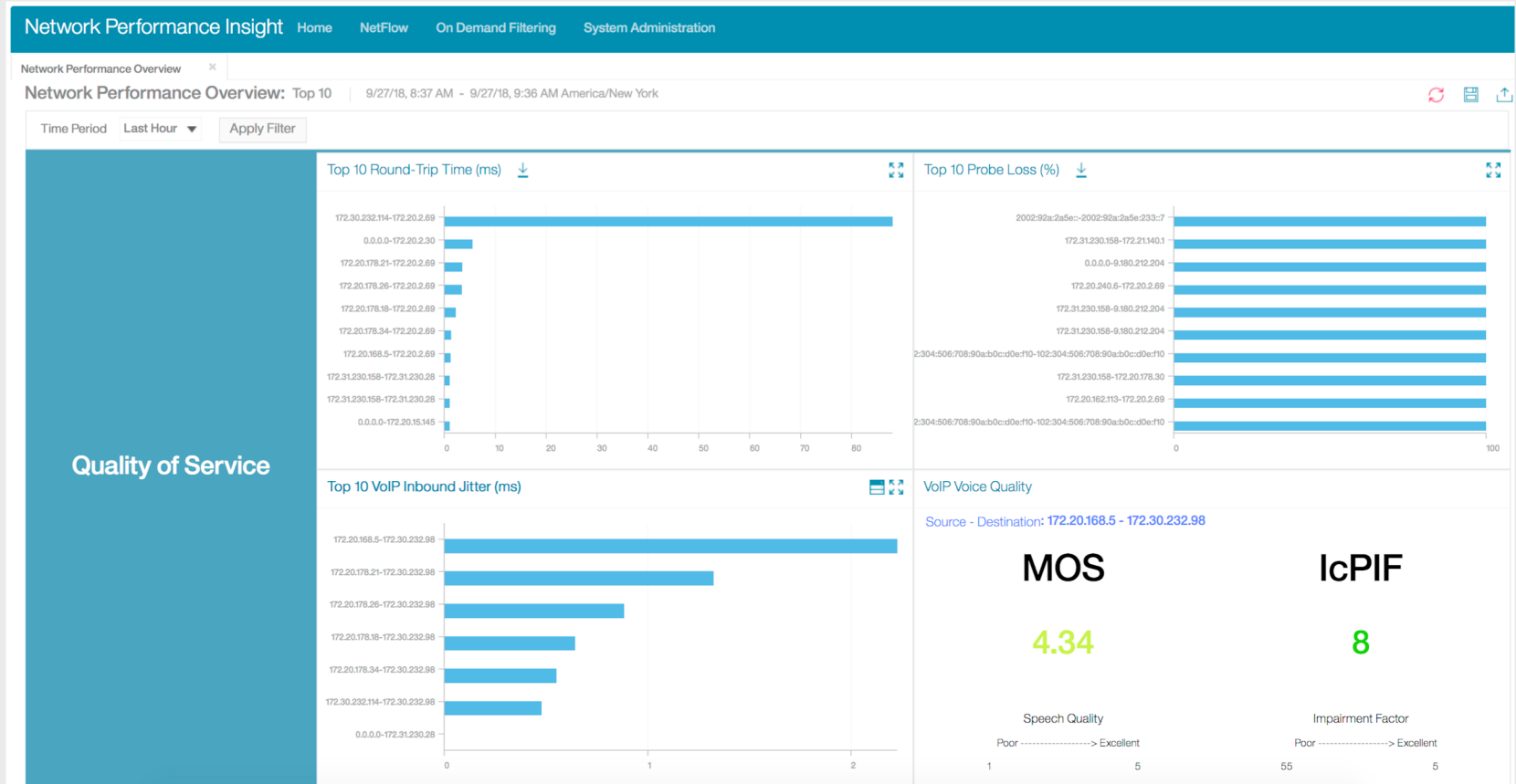


IP-SLA

- SNMP Credentials shared by ITNM & NPI
- More about conf.key at <https://ibm.biz/BdYpwE>



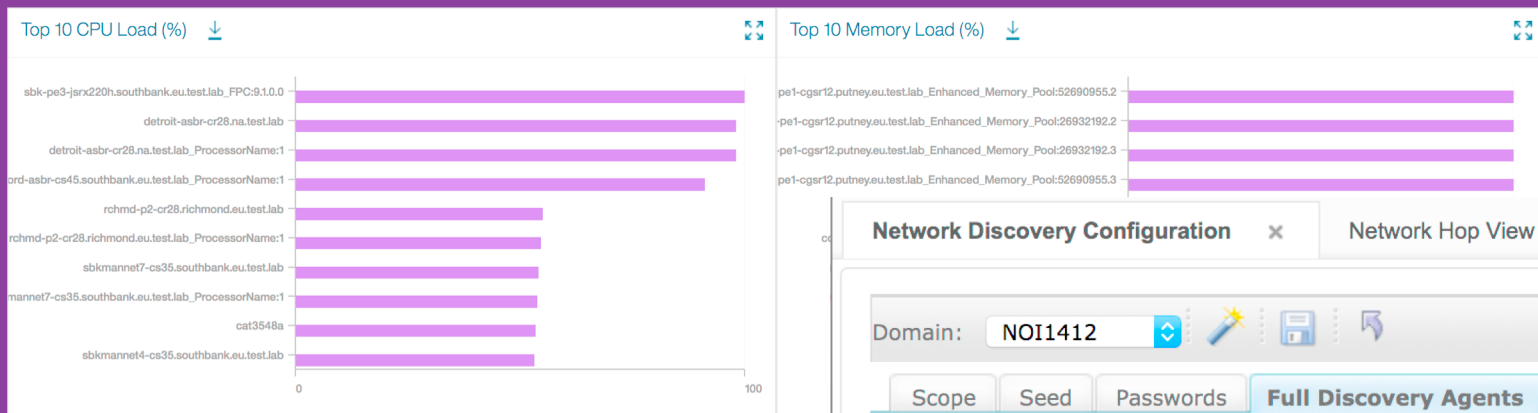
IP-SLA Metrics



- IP-SLA Metrics at - <https://ibm.biz/BdY2HR>
- How to configure QoS & ART at - <https://ibm.biz/BdYpw8>

Performance Metric OOTB Device Support (PODS)

Device Load



- CPU, Memory & Several other metrics
- Must complete post-installation steps listed <https://ibm.biz/BdYpww>

Network Discovery Configuration x Network Hop View x Dashboards x Network Polling x

Domain: NOI1412

Scope Seed Passwords Full Discovery Agents

- ✓ PODS_Cisco_Enhanced_Mempool
- ✓ PODS_Cisco_Entity_Sensor
- ✓ PODS_Cisco_Envmon
- ✓ PODS_Cisco_Memory_Pool
- ✓ PODS_Cisco_Processor
- ✓ PODS_Huawei_Entity
- ✓ PODS_Juniper_Chassis
- ✓ PODS_Juniper_System
- ✓ RedbackContext

	Enabled	Status	Name	Poll Definitions	Device Membership
<input type="checkbox"/>	✓	✓	Cisco Device	CiscoDevice ASR Nexus Fan State,CiscoDevice Fan State more...	Devices
<input type="checkbox"/>	✓	✓	Huawei Device	Huawei CPU Utilization,Huawei Memory Utilization more...	Devices
<input type="checkbox"/>	✓	✓	Juniper Device	JuniperChassis Buffer Utilization JuniperChassis CPU Service Interrupt Utilization JuniperChassis CPU Utilization avg last 5min JuniperChassis Heap Utilization JuniperChassis Temperature JuniperERX CPU Utilization JuniperERX Memory Utilization ...less	Devices

NPI Dashboards and Target Personas

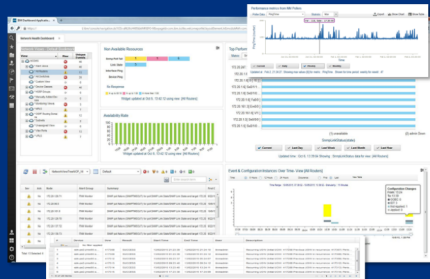
Performance Management solution that delivers seamless contextualized insights



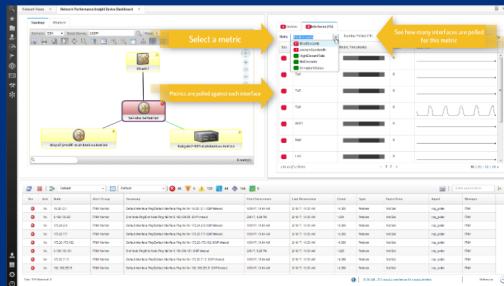
Persona: Annette
IT/Network ops
team generalist

Use Case
Troubleshooting
[Localize Resource
Trouble]

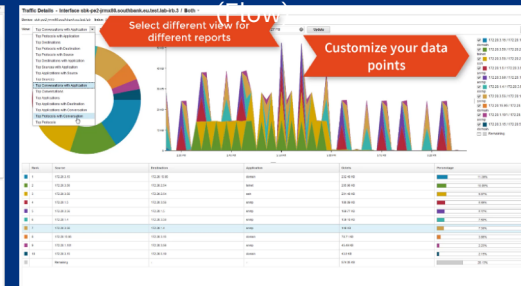
Network Health Dashboard (NHD)



Device Dashboard



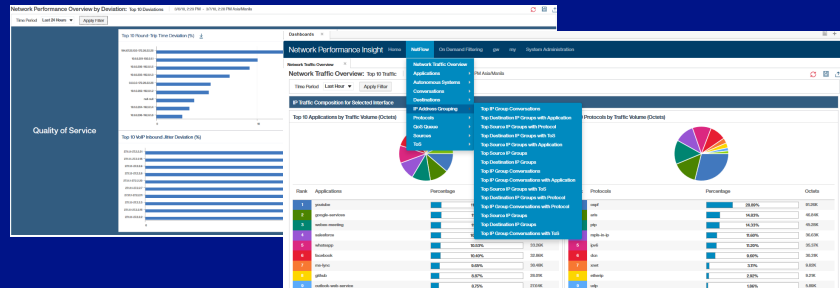
Traffic Details



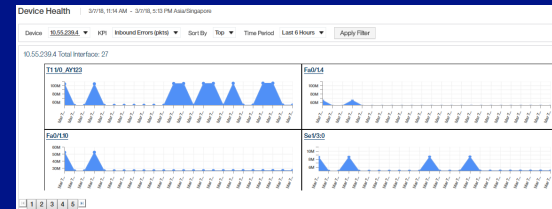
Persona: Alex
Network ops team SME,
Alternate Persona:
Global Operations Mgr

Use Case
Analyze and Report
Resource Performance

Network Performance Overview, Network Traffic Overview



Device Performance Report (On-Demand Filtering)



Quick Demo

and

Q&A