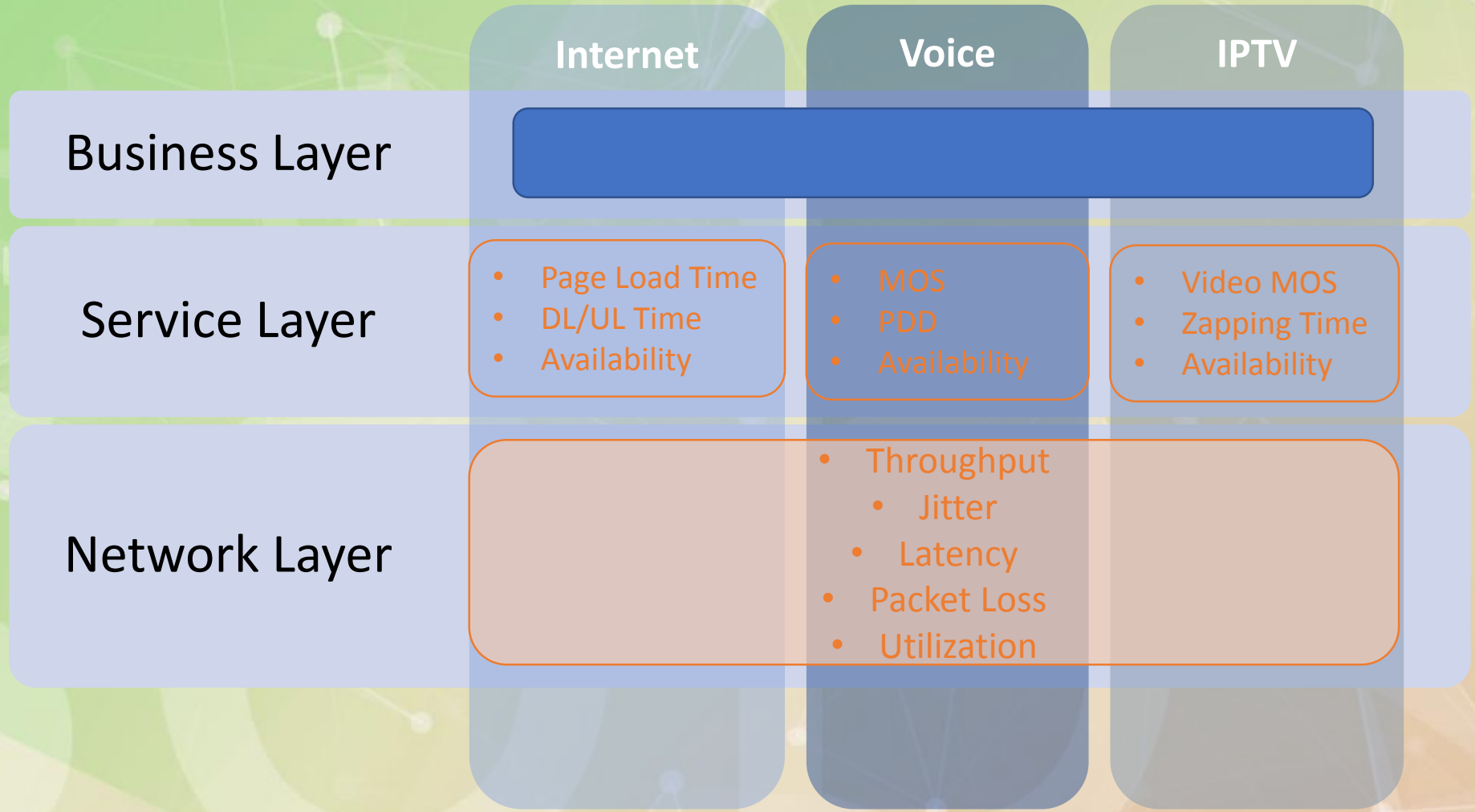
Network Performance Monitoring Tools Assessment for IP & Core Network

KJN M-038-2017
Digital Infrastructure Research – Telkom DDS

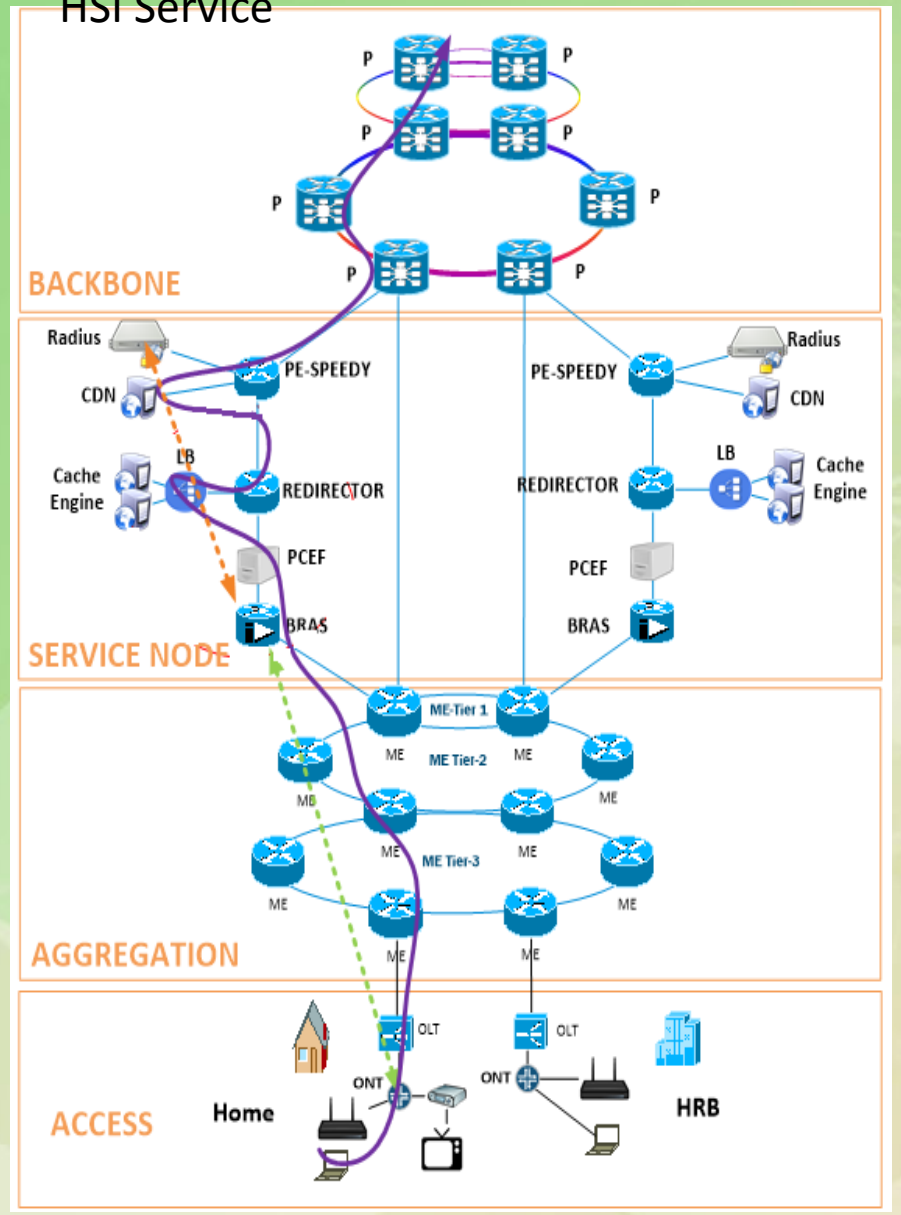
Parameter Service Quality Management

DIGITAL SERVICE

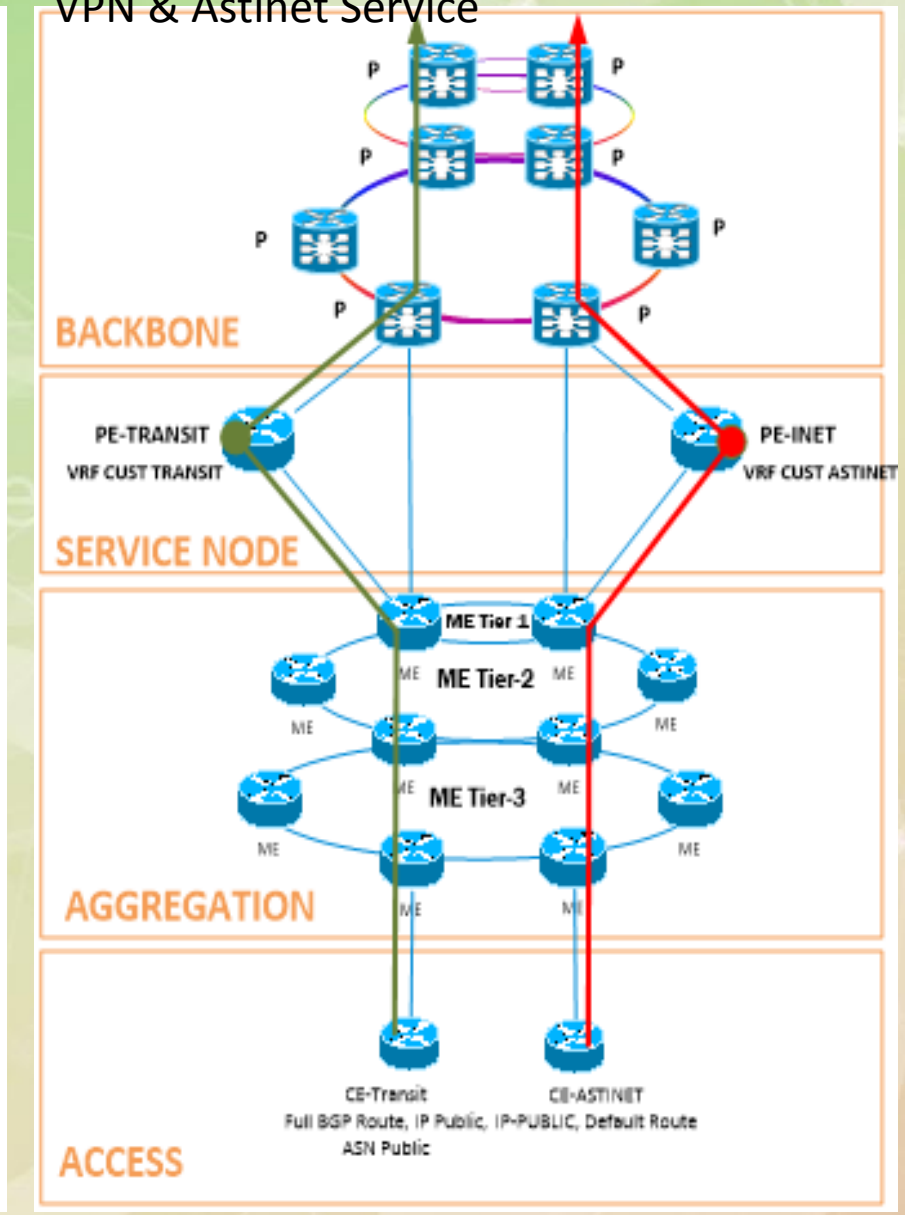


Network Topology per Service (Internet)

HSI Service



VPN & Astinet Service



DIGITAL SERVICE

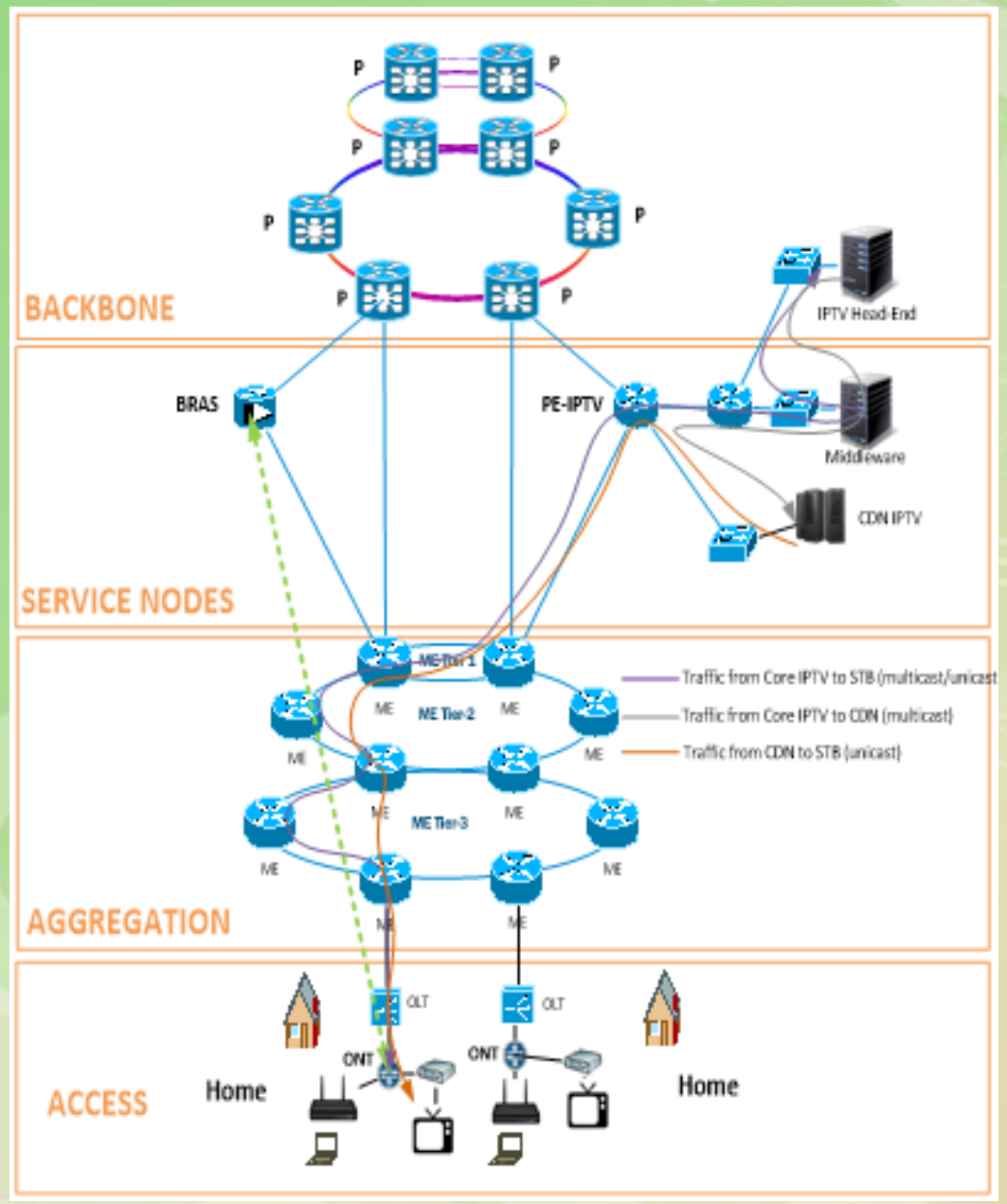
Parameter Service :

- Page Load Time : Access - Internet
- DL/UL Time : Access - Internet
- Availability : Access; Aggregation; SN; BB

Parameter Network

- Throughput : Access-SN; SN – Internet; Aggregation; BB
- Jitter : Access; Aggregation; SN; BB
- Latency : Access; Aggregation; SN; BB
- Packet Loss : Access; Aggregation; SN; BB
- Utilization : Access; Aggregation; SN; BB

Network Topology per Service (IPTV)



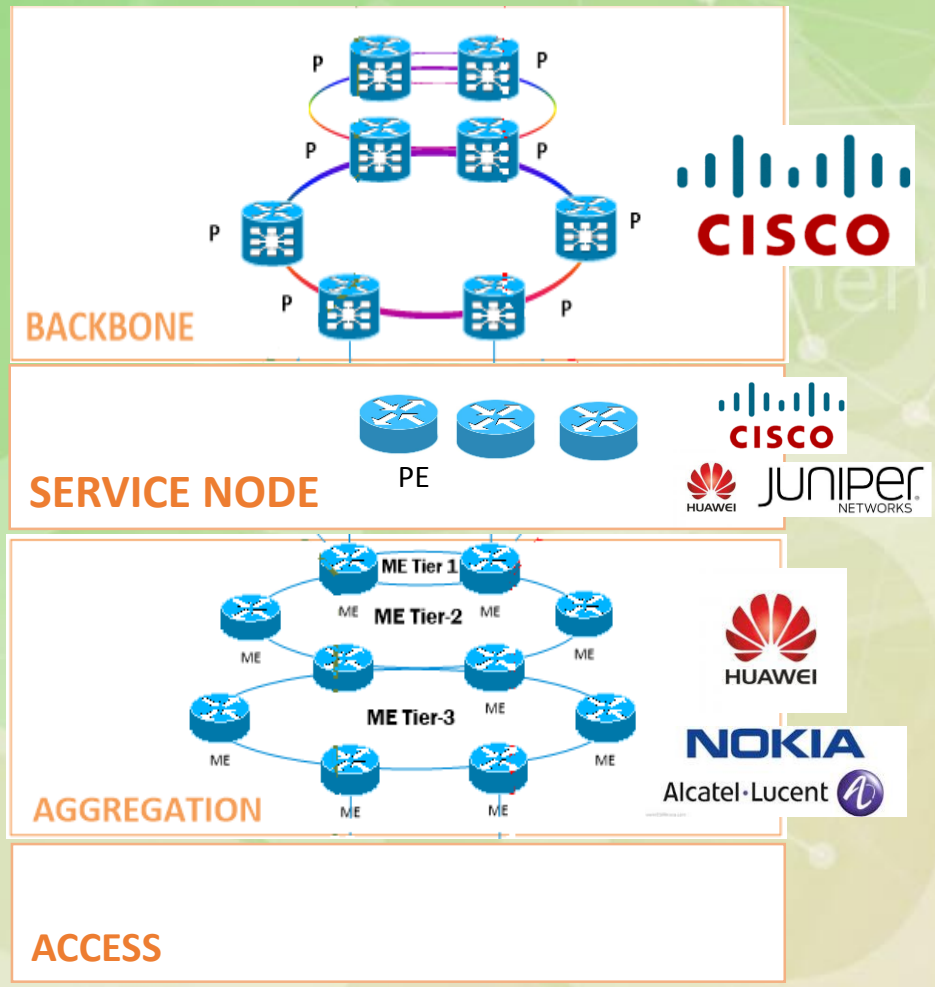
Parameter Service :

- Video MOS : Access – SN;
- Zapping Time : Access - Internet
- Availability : Access; Aggregation; SN; BB

Parameter Network

- Throughput : Access- SN; SN – Internet; Aggregation; BB
- Jitter : Access; Aggregation; SN; BB
- Latency : Access; Aggregation; SN; BB
- Packet Loss : Access; Aggregation; SN; BB
- Utilization : Access; Aggregation; SN; BB

Inventories



Network Elements Parameter Monitored by Tools:

- Active
  - Delay,
  - Jitter,
  - Packet Loss
  - Throughput
- Passive
  - Utilization Node,
  - Utilization Link,
  - Availability Node,
  - Availability Link

Brix Networks
ca technologies
splunk>
MRTG
Performance Monitoring Tools

CISCO
Cisco Prime Infrastructure
HUAWEI iManager U2000
Alcatel·Lucent Service Aware Manager (SAM)
JUNOS SPACE
NMS

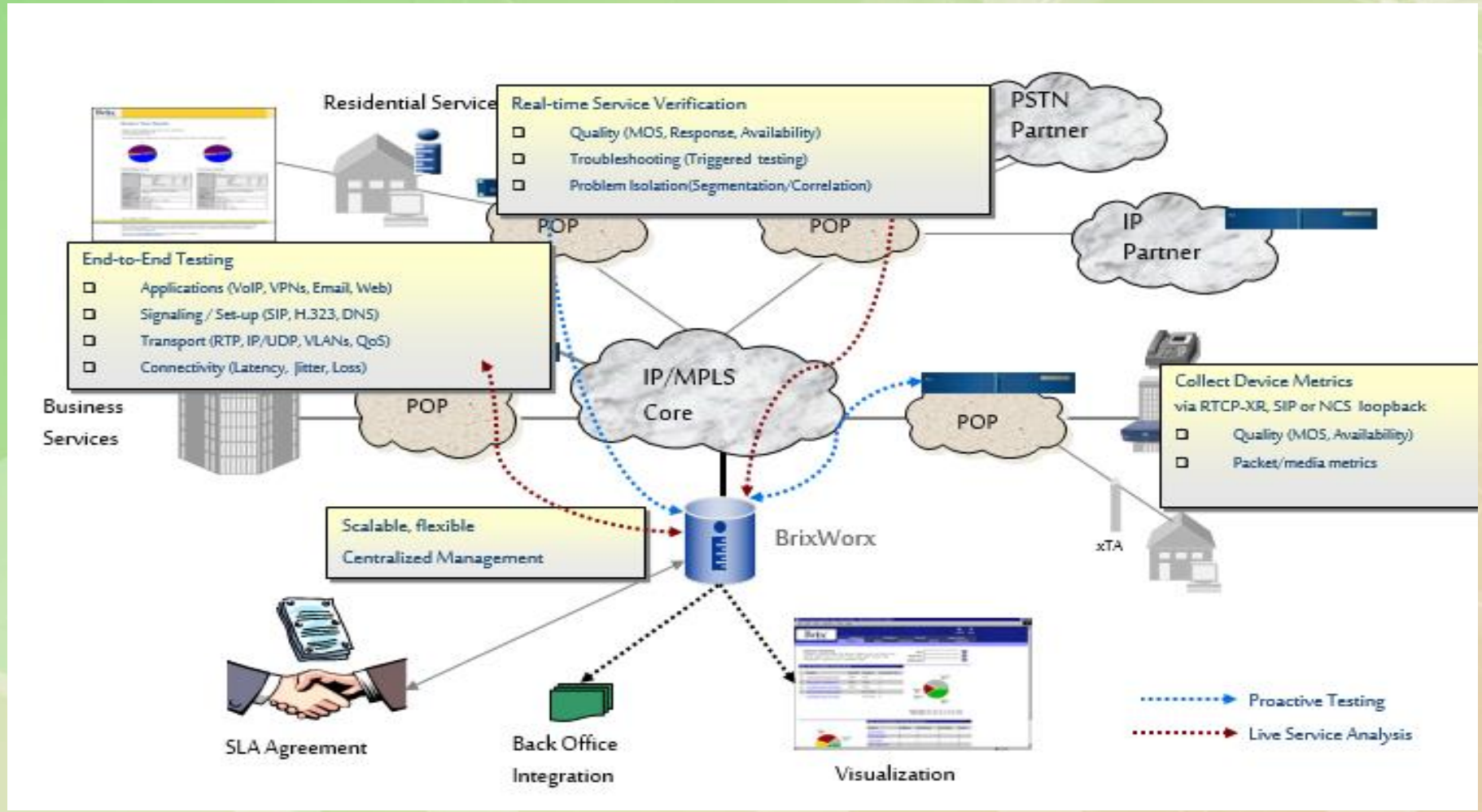
WANDL WIDE AREA NETWORK DESIGN LABORATORY
Planning Tools

DIGITAL SERVICE

Security Assessment Report

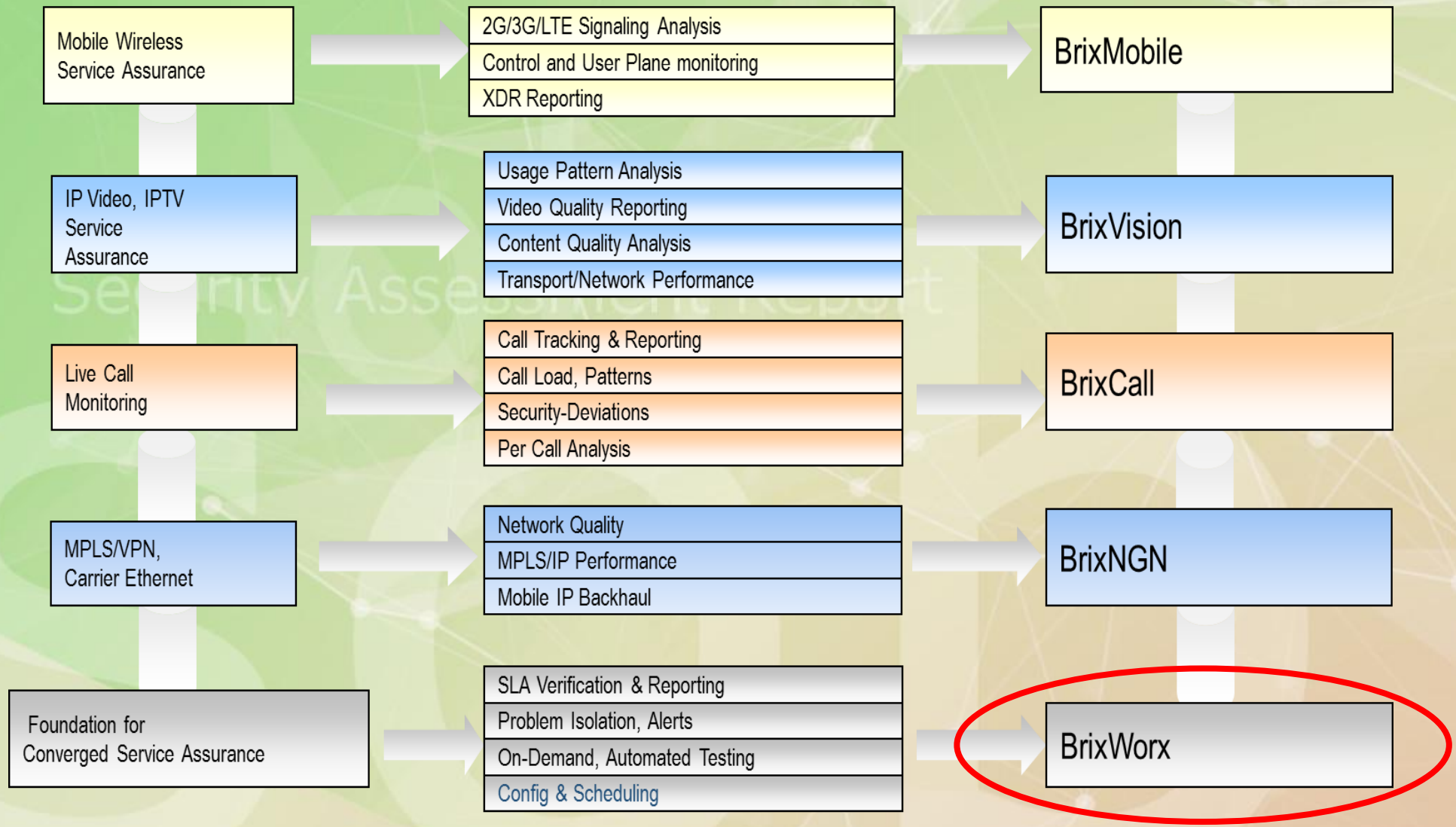
BRIX - EXFO

BRIX - EXFO

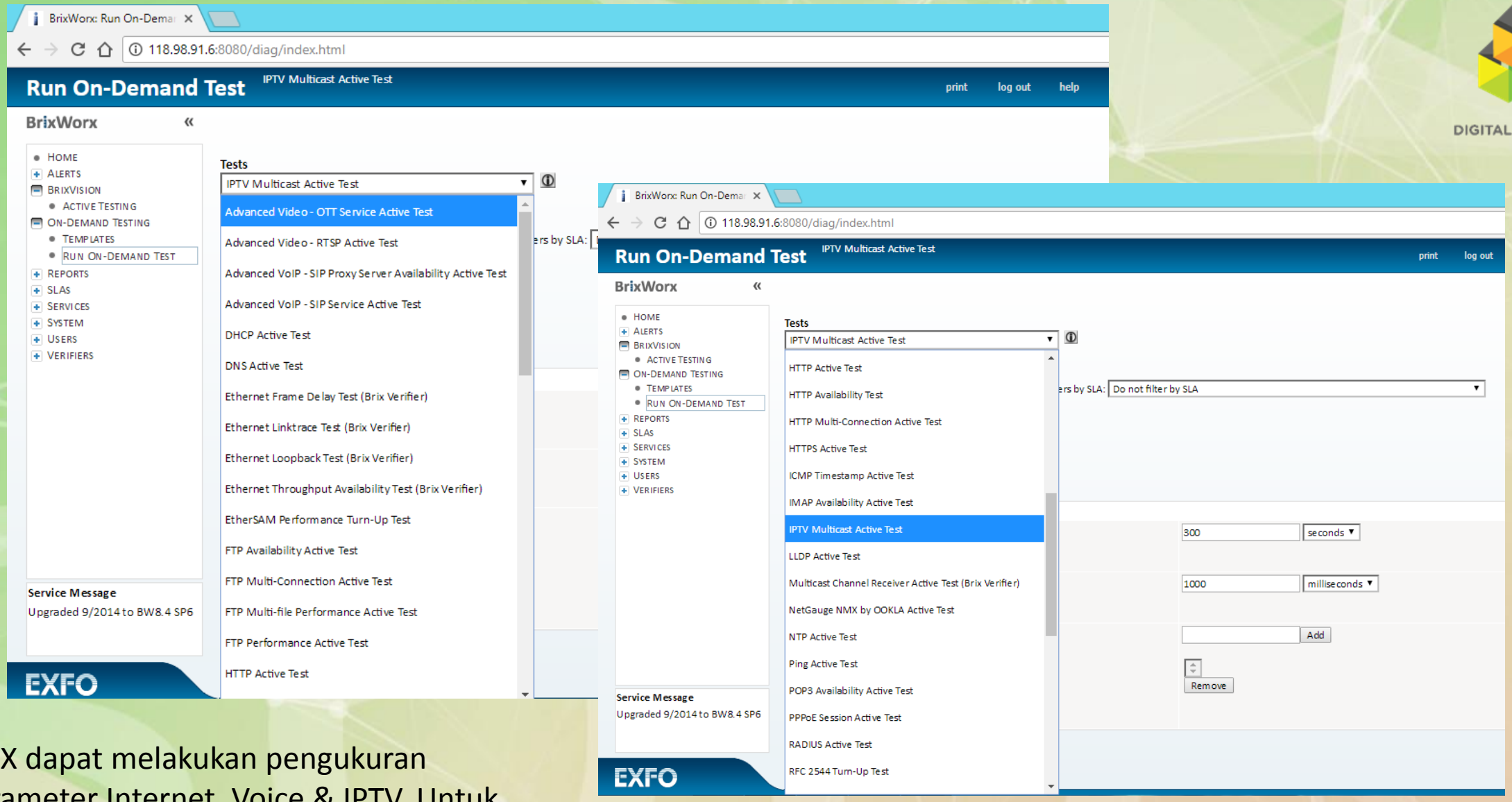


There is next gen probe placed at key points in the network. Brix provides automated active testing, passive monitoring for live service analysis and reporting.

BRIX - EXFO



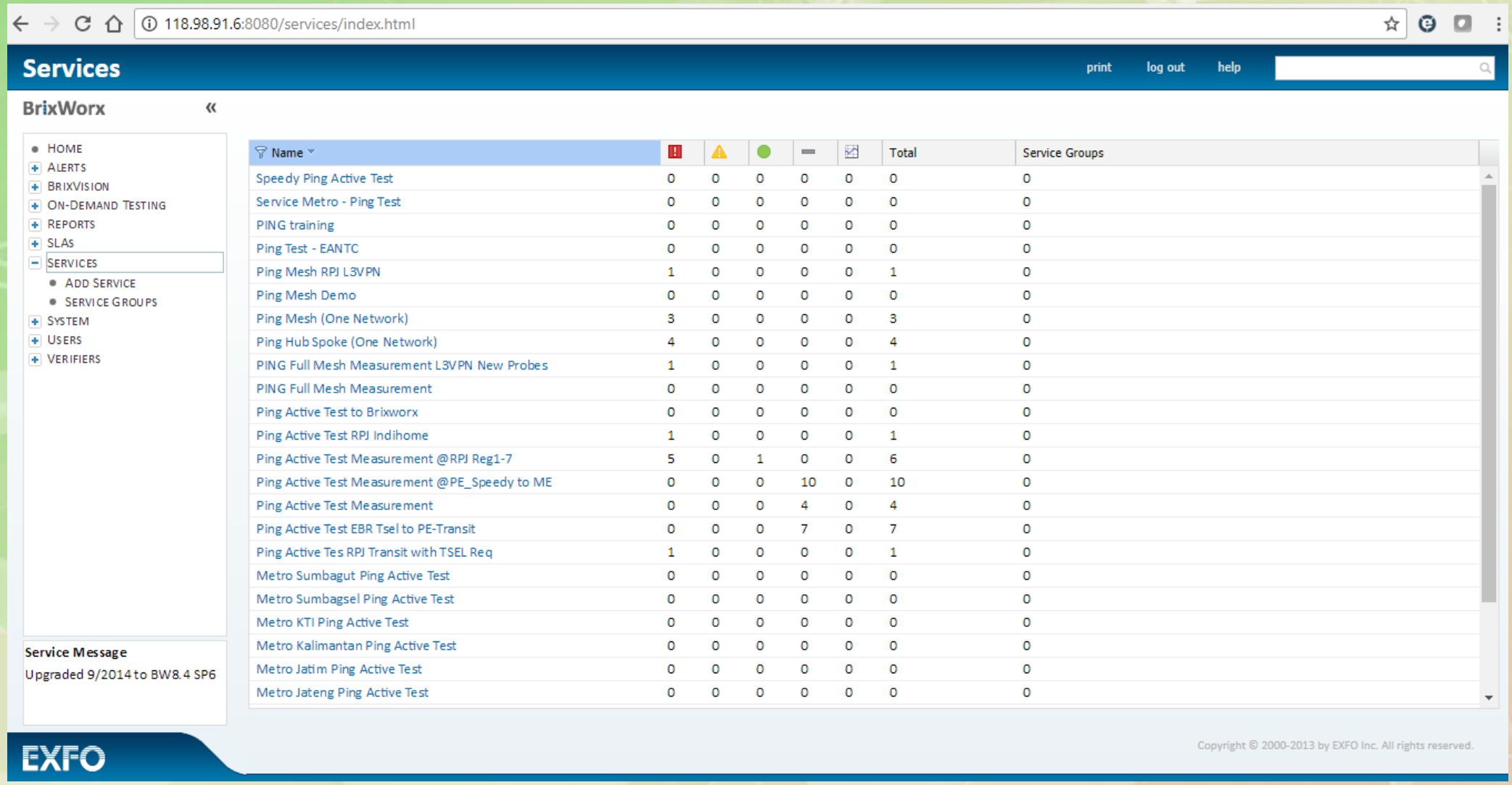
Yang saat ini dimiliki Telkom Digunakan untuk memonitor perangkat Metro, PE dan Tera Router (active tools)



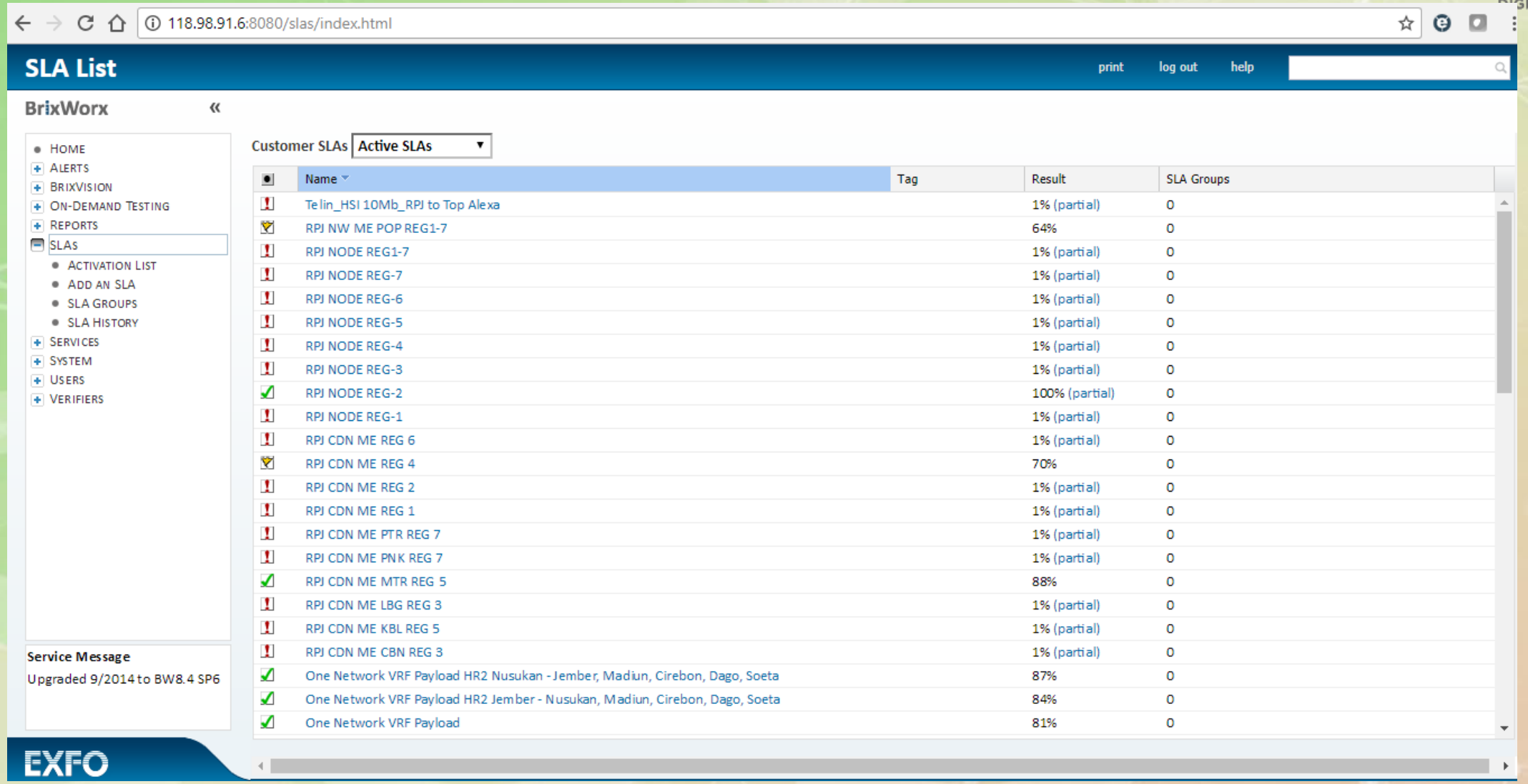
BRIX dapat melakukan pengukuran parameter Internet, Voice & IPTV. Untuk license pengukuran parameter IPTV belum dimiliki oleh Telkom.

Services Monitor

DIGITAL SERVICE



SLA Monitor

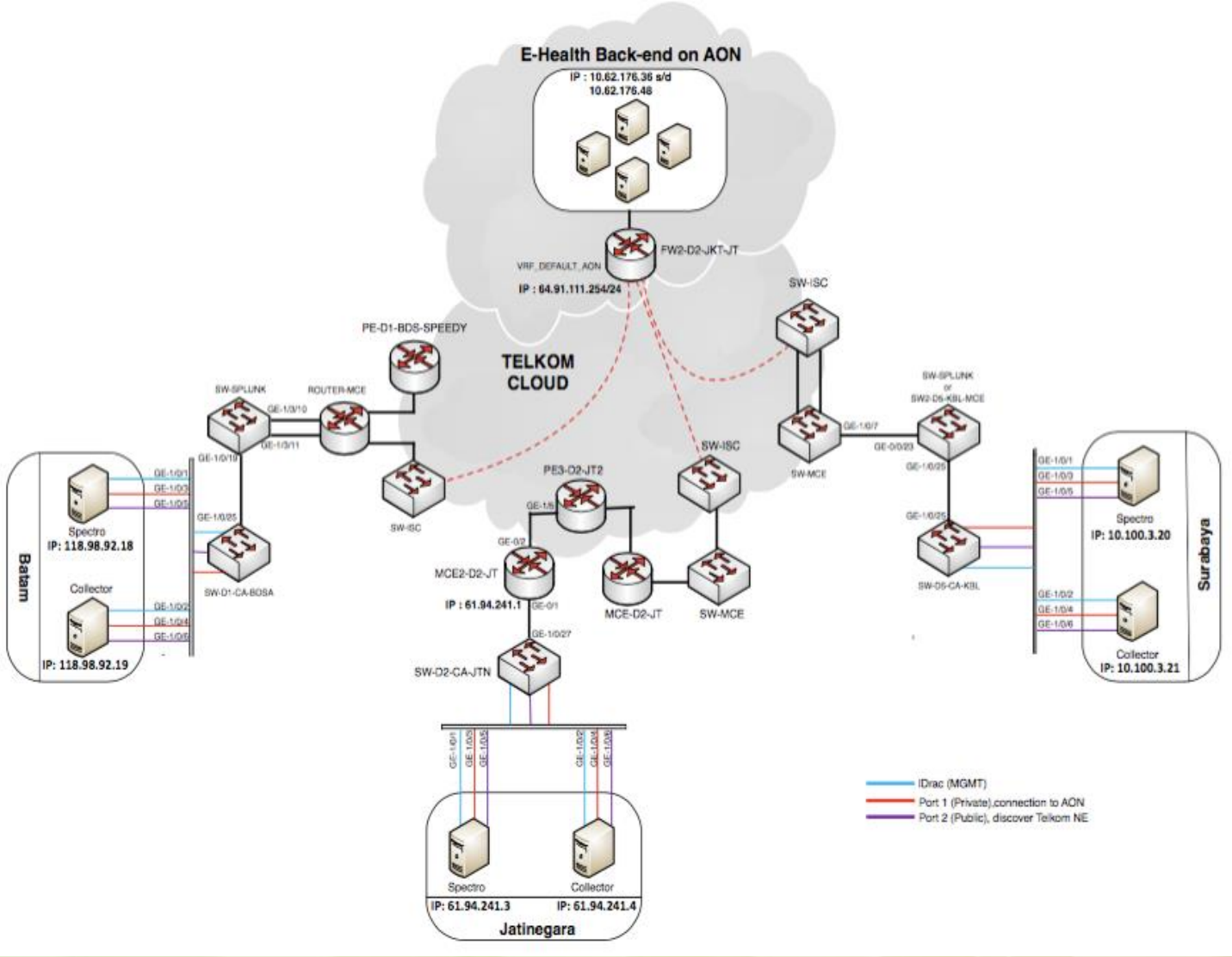

118.98.91.6:8080/slas/index.html
SLA List
print
log out
help
BrixWorx
HOME
ALERTS
BRIXVISION
ON-DEMAND TESTING
REPORTS
SLAS
ACTIVATION LIST
ADD AN SLA
SLA GROUPS
SLA HISTORY
SERVICES
SYSTEM
USERS
VERIFIERS
Service Message
Upgraded 9/2014 to BW8.4 SP6
Customer SLAs
Active SLAs
Name
Tag
Result
SLA Groups
Telin_HSI 10Mb_RPJ to Top Alexa 1% (partial) 0
RPJ NW ME POP REG1-7 64% 0
RPJ NODE REG1-7 1% (partial) 0
RPJ NODE REG-7 1% (partial) 0
RPJ NODE REG-6 1% (partial) 0
RPJ NODE REG-5 1% (partial) 0
RPJ NODE REG-4 1% (partial) 0
RPJ NODE REG-3 1% (partial) 0
RPJ NODE REG-2 100% (partial) 0
RPJ NODE REG-1 1% (partial) 0
RPJ CDN ME REG 6 1% (partial) 0
RPJ CDN ME REG 4 70% 0
RPJ CDN ME REG 2 1% (partial) 0
RPJ CDN ME REG 1 1% (partial) 0
RPJ CDN ME PTR REG 7 1% (partial) 0
RPJ CDN ME PNK REG 7 1% (partial) 0
RPJ CDN ME MTR REG 5 88% 0
RPJ CDN ME LBG REG 3 1% (partial) 0
RPJ CDN ME KBL REG 5 1% (partial) 0
RPJ CDN ME CBN REG 3 1% (partial) 0
One Network VRF Payload HR2 Nusukan - Jember, Madiun, Cirebon, Dago, Soeta 87% 0
One Network VRF Payload HR2 Jember - Nusukan, Madiun, Cirebon, Dago, Soeta 84% 0
One Network VRF Payload 81% 0
EXFO

DIGITAL SERVICE

Security Assessment Report

CA PM – SPECTRUM - SOI

CA Performance Management/PM (eHealth)

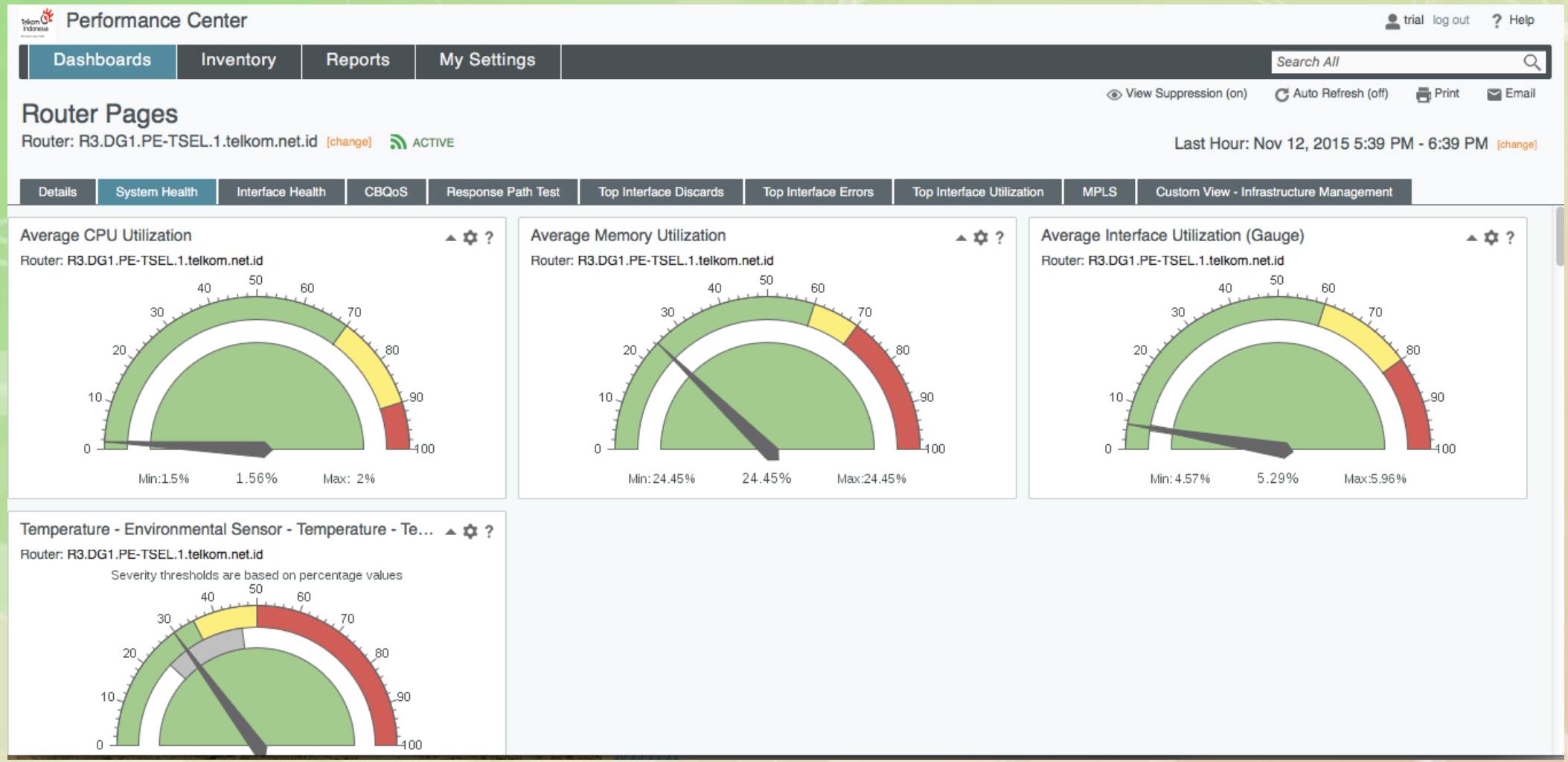


NO	DEVICES	TOTAL DISCOVER
1	PE (VPN,SPEEDY,TRANSIT,INET,SPEEDY)	249
2	TERA	45
3	METRO	1351
4	BRAS	42
5	CES	447
6	CNOP	56
7	WAG	18
8	SW	178
9	REDIRECTOR	69
10	SERVER	26
11	PINGABLE / UNDISCOVER	1225
	TOTAL	**3707**

Network Elements Performance Monitoring (Passive Parameter) : device health, availability & utilization nodes and links.

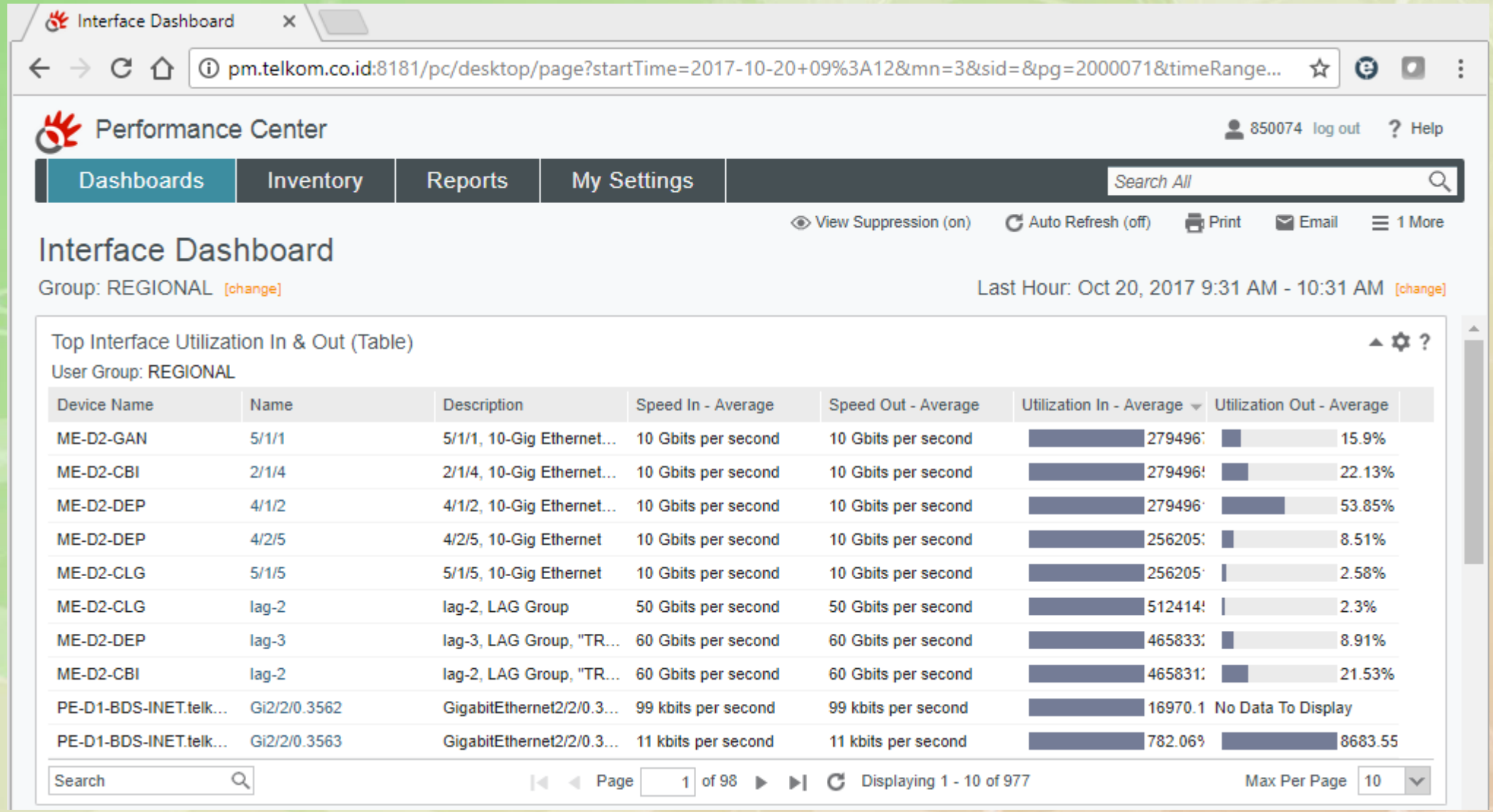
DASHBOARD PERFORMANCE MANAGEMENT
CPU-MEMORY-TEMPERATURE

DIGITAL SERVICE



DASHBOARD PERFORMANCE MANAGEMENT
INTERFACE UTILIZATION/DISCARD/TREND

DIGITAL SERVICE



DASHBOARD PERFORMANCE MANAGEMENT
QOS PACKAGE

DIGITAL SERVICE

Performance Center

trial log out Help

Dashboards | Inventory | Reports | My Settings | Search All

View Suppression (on) Auto Refresh (off) Print Email

Interface Pages

Router: PE3-D2-CKA-VPN.telkom.net.id Interface: GigabitEthernet0/0/1/3.616 - VPNIP BANK INDONESIA BACKHAUL CID 2C

Last 7 Days: Nov 5, 2015 6:44 PM - Nov 12, 2015 6:44 PM [change]

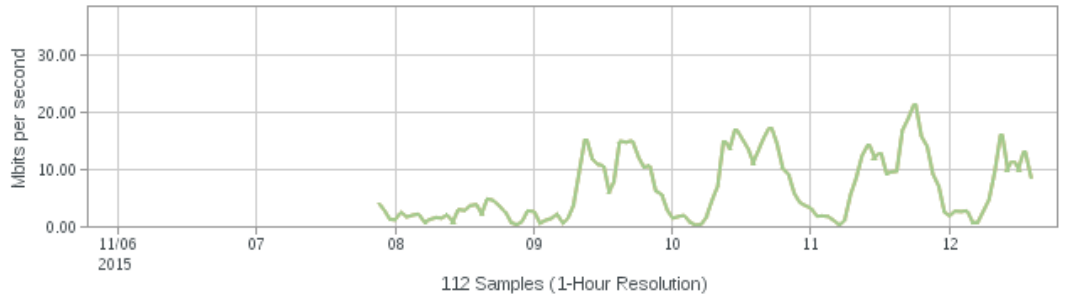
Details | Interface Health | IP Performance | CBQoS | Calendar Heat Charts | Custom View - Infrastructure Management

Page 1 of 1

Router: PE3-D2-CKA-VPN.telkom.net.id Interface: GigabitEthernet0/0/1/3.616 - VPNIP BANK INDONESIA BACKHAUL CID 20210016 SID 4700029-51148

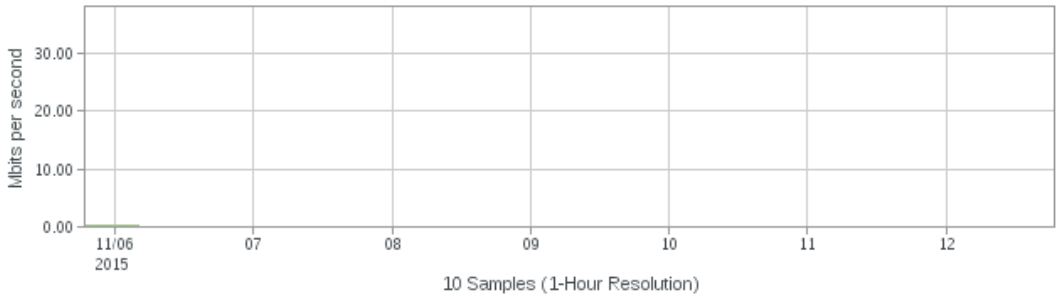
Post-Policy Pre-Policy [Time Zone: WIB]

cbQoS GigabitEthernet0/0/1/3.616-Package7-class-default-IN



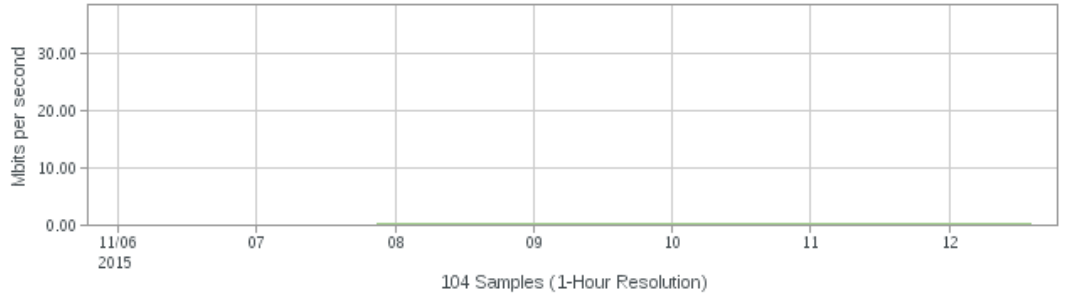
112 Samples (1-Hour Resolution)

cbQoS GigabitEthernet0/0/1/3.616-Package7_BI-Critical-OUT



10 Samples (1-Hour Resolution)

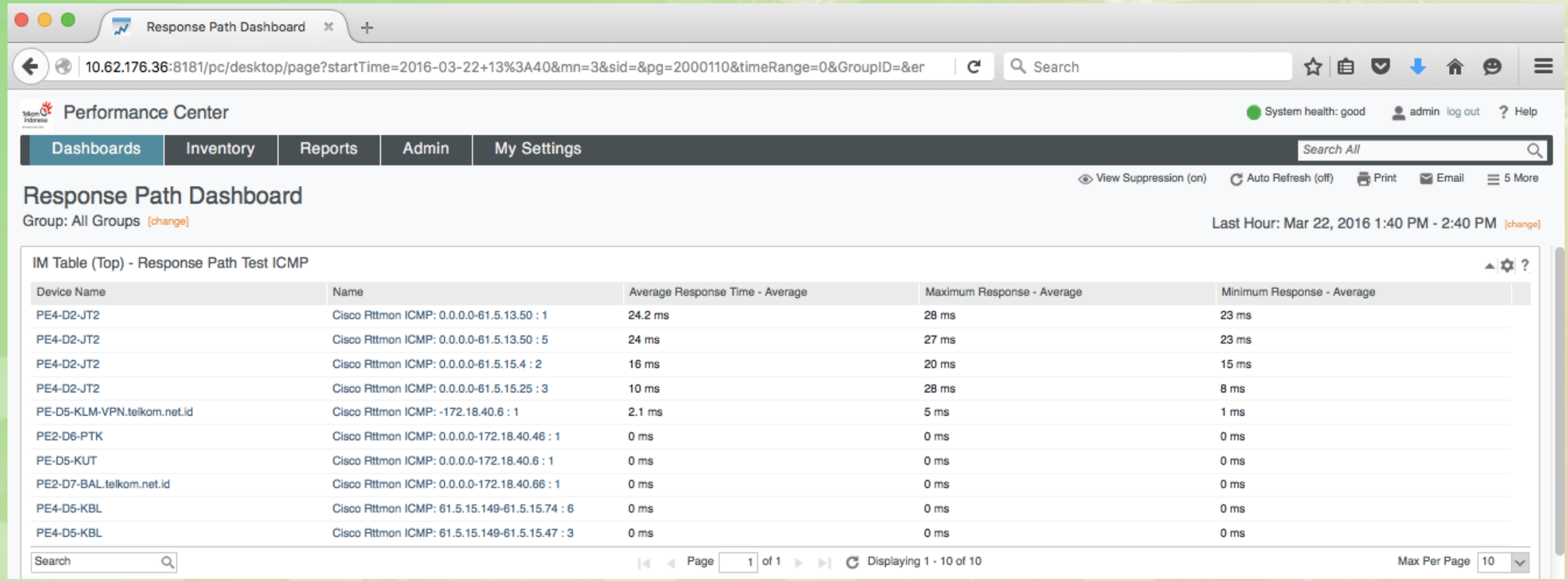
cbQoS GigabitEthernet0/0/1/3.616-Package7_BI-VoIP-OUT



104 Samples (1-Hour Resolution)

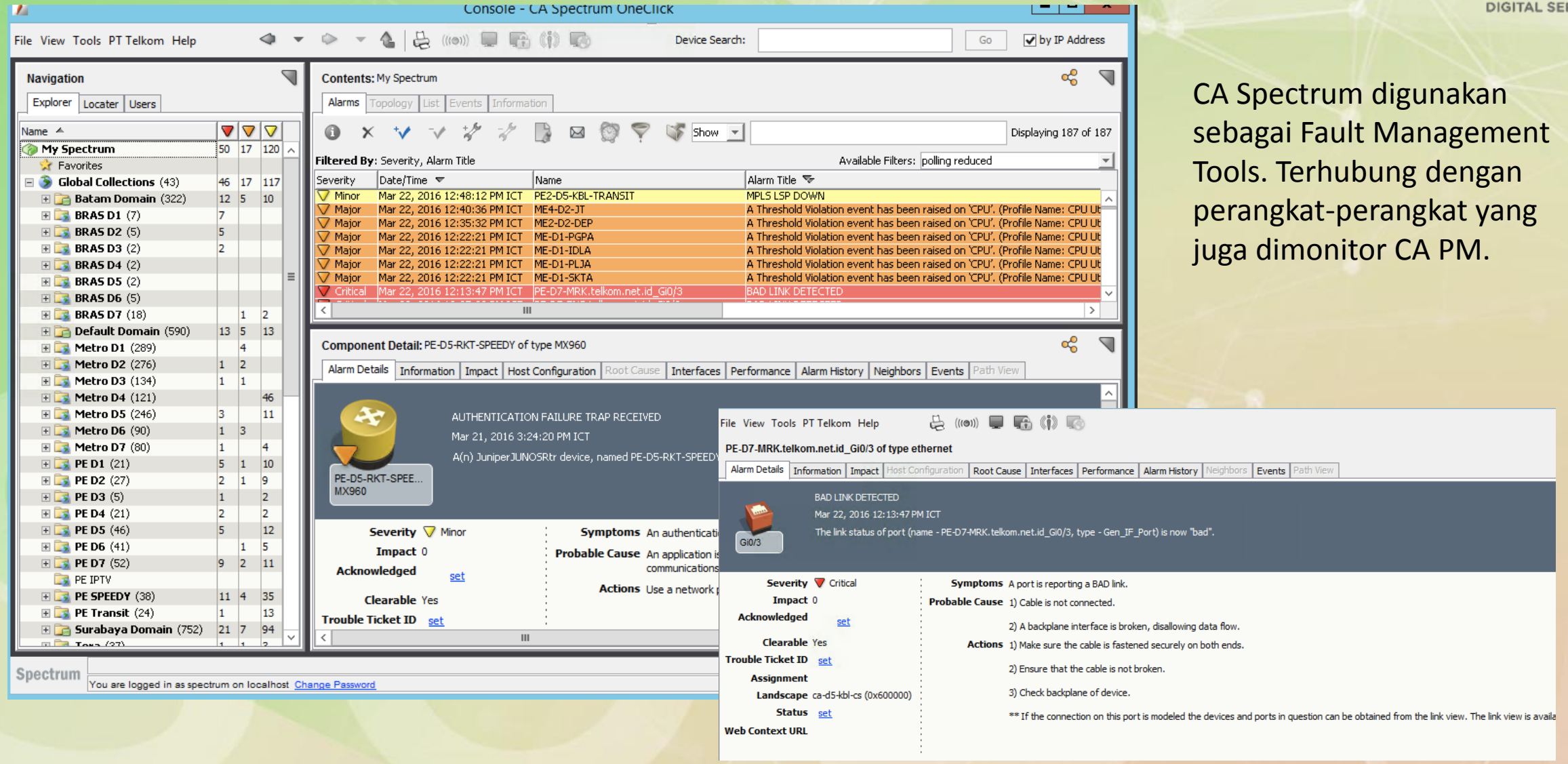
DASHBOARD PERFORMANCE MANAGEMENT RESPONSE PATH

DIGITAL SERVICE



Untuk digunakan sebagai tools active yang mengukur parameter performansi layanan jaringan, CA PM mengambil data dari pengukuran yang dilakukan oleh perangkat setelah diaktifkan IP SLA nya. Saat ini baru dapat dilakukan pada perangkat Cisco. Sementara untuk platform lain, diperlukan network engineering atau skema bisnis yg lain.

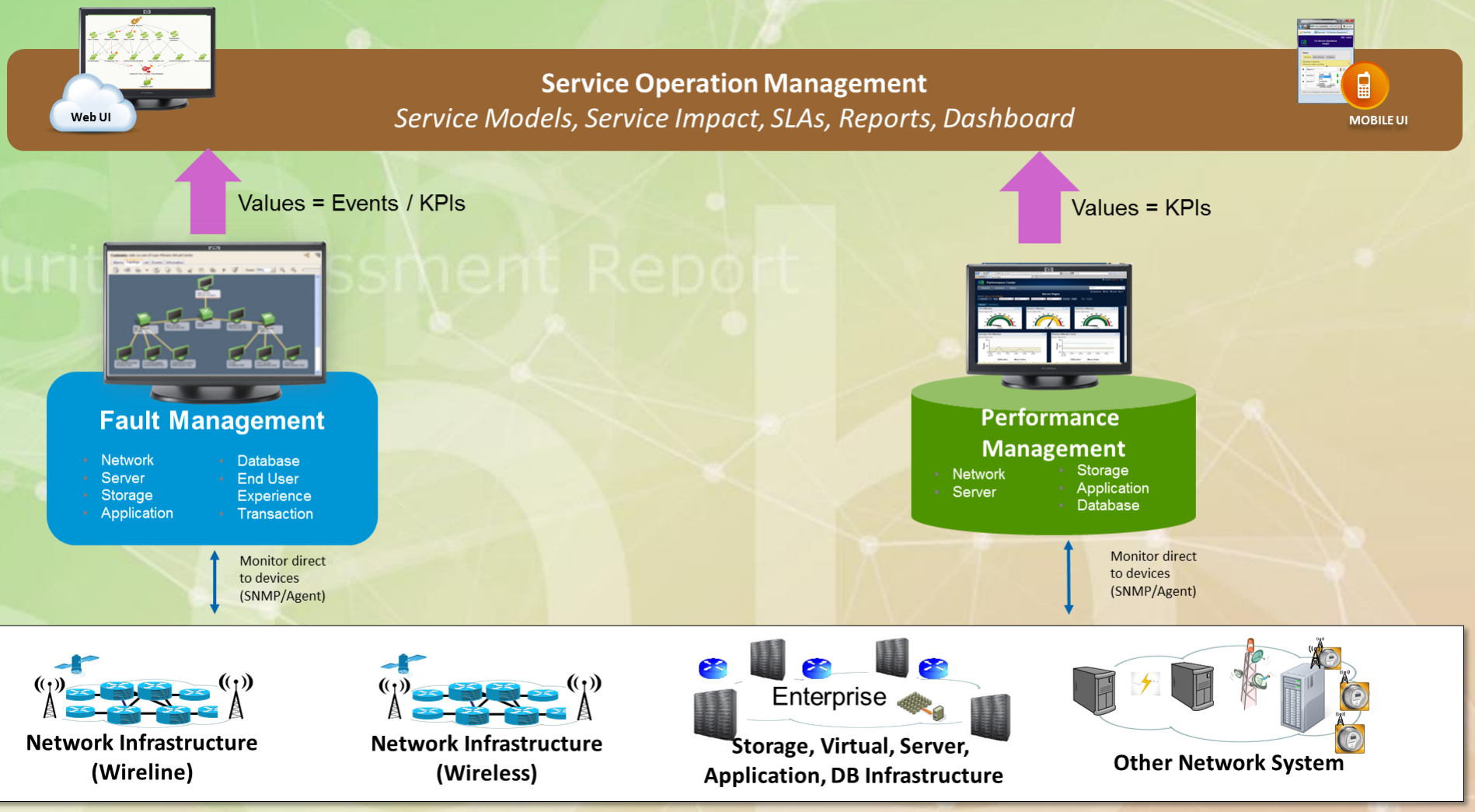
CA Spectrum – Fault Management



CA Spectrum digunakan sebagai Fault Management Tools. Terhubung dengan perangkat-perangkat yang juga dimonitor CA PM.

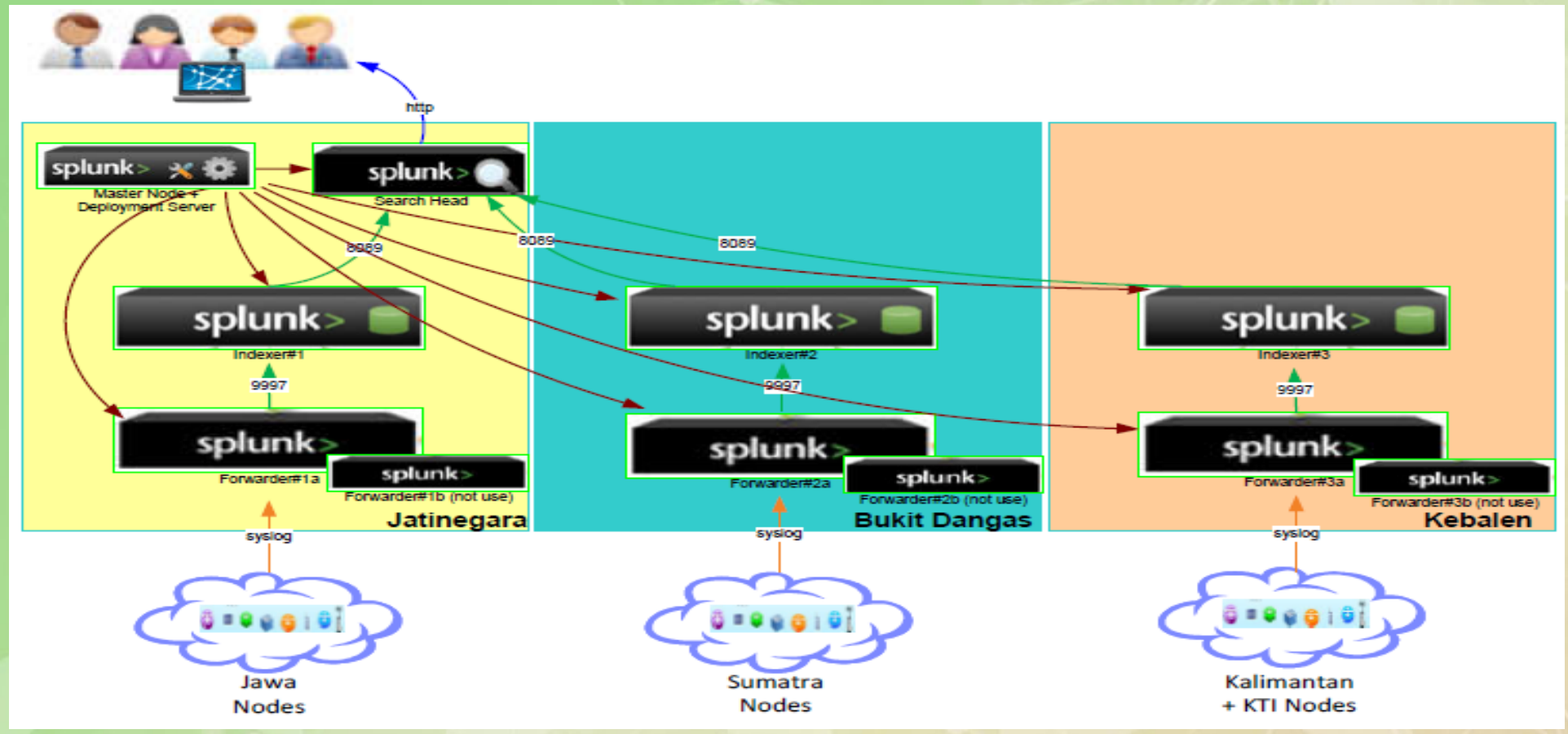
CA Service Operation Insight (SOI)

DIGITAL SERVICE



DIGITAL SERVICE

SPLUNK



DIGITAL SERVICE

Splunk Enterprise stack

Learn more

Licenses	Volume	Expiration	Status	
Splunk Enterprise	51,200 MB	Jan 19, 2038 3:14:07 AM	valid	Delete
Splunk Enterprise	5,120 MB	Jan 19, 2038 10:14:07 AM	valid	Delete
Splunk Enterprise	51,200 MB	Jan 19, 2038 10:14:07 AM	valid	Delete
Effective daily volume	**107,520 MB**			

Pools	Indexers	Volume used today	
auto_generated_pool_enterprise		19,052 MB / 107,520 MB	Edit | Delete

105 GB

Fault Management : Monitoring
& Troubleshooting Tools via log

The Power of Splunk

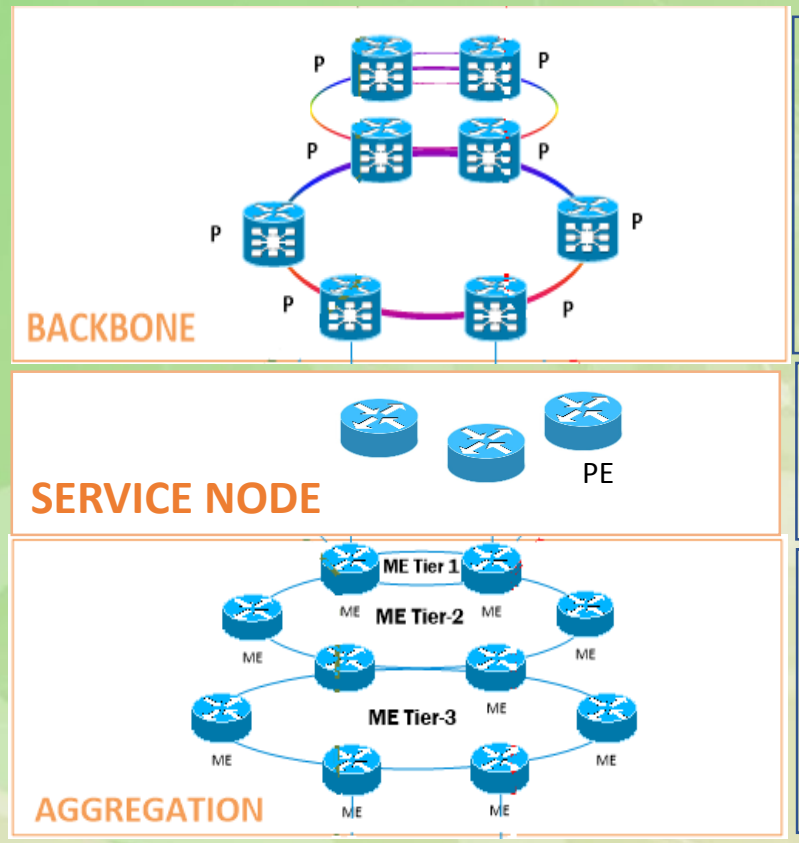
COLLECT DATA FROM ANYWHERE

SEARCH AND ANALYZE EVERYTHING

GAIN REAL-TIME OPERATIONAL INTELLIGENCE

NMS

NMS



CISCO
Cisco Prime Infrastructure

JUNOS SPACE
CISCO
Cisco Prime Infrastructure
HUAWEI
iManager U2000

HUAWEI
iManager U2000
Alcatel·Lucent
Service Aware Manager (SAM)

FCAPS

Matrix Tools vs NE

Parameter vs NE vs Tools

DIGITAL SERVICE

	Delay, TP, PL, Jitter	Avail. Nodes	Avail. Links	Util. Nodes	Util. Links	Fault Manage.
Brix Networks	NOKIA Alcatel-Lucent JUNIPER NETWORKS CISCO HUAWEI		NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO			
ca technologies	* CISCO	NOKIA Alcatel-Lucent JUNIPER NETWORKS CISCO HUAWEI	NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO	NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO	NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO	NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO
splunk>		NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO		NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO		NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO
MRTG			NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO		NOKIA Alcatel-Lucent JUNIPER NETWORKS HUAWEI CISCO	

* Secara teori CA mampu mendapatkan hasil pengukuran parameter tsb di semua perangkat, namun diperlukan skema teknis & bisnis tersendiri untuk memperoleh MIB file dari platform selain Cisco

Parameter Service vs Tools

DIGITAL SERVICE

Service Application	Active Test & Moonitoring Tools
Internet	Brix Networks, ca technologies
VPN & Astinet	Brix Networks, ca technologies
VoIP	Brix Networks
IPTV	Brix Networks, iQAS ZTE, SQM HW

Kesimpulan

- Pemanfaatan tools yg sudah implemented sudah cukup memonitor semua node dalam segmen IP & Backbone dan mencakup parameter-parameter yang dibutuhkan.
- Active Tools untuk memonitor parameter service :
  - BRIX – EXFO dengan probe dan fitur yang diaktifkan masih terbatas,
  - CA PM baru dapat digunakan pada perangkat Cisco, untuk perangkat lain perlu skema teknis & bisnis tertentu untuk memperoleh file MIB agar fungsi ini dapat berjalan.
- Passive Tools untuk memonitor performansi nodes & links :
  - CA PM, MRTG, Splunk dan NMS untuk masing-masing platform.
- Fault Management menggunakan CA Spectrum & Splunk.

Rekomendasi

DIGITAL SERVICE

- Melihat pada kesesuaian matrix Network Performance Monitoring , yang paling mendekati kebutuhan end-to-end adalah CA (PM, Spectrum dan SOI), perlu dievaluasi kembali skema bisnis yg tepat agar CA dapat memperoleh data MIB dari setiap perangkat yang dibutuhkan untuk dapat menjalankan fungsinya dengan baik.
- Untuk Service Quality Monitoring (berbasis per layanan) dapat mengeksplorasi lebih lanjut kapabilitas Brix (active tools) pada layanan Internet, Voice dan IPTV.
- Dengan kapabilitas log analyzer yang dimilikinya, Splunk lebih tepat diposisikan sebagai Data Analityc Tools.

DIGITAL SERVICE