

# The truth lies in the packet

March 2024

Marc Meulensteen, Sr. Solutions Engineer Enterprise



# Agenda

Data sources

Visibility

What's in the packet

The truth

Netflow vs Full Packet Data

Packets vs other data sources



### What is available?

#### Data sources



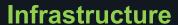
#### **Machine**

(syslog)
Unstructured
Generated by
Devices, Servers,
Clients



### **WireData**

(packets) from Taps, SPAN, Aggregators



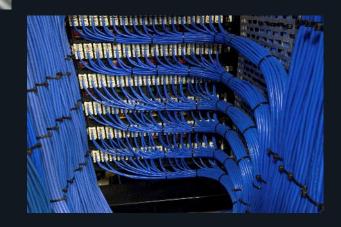
(SNMP) Simple Counters

> Port Status CPU %util Memory



#### **Network**

(Netflow/sFlow)
Conversation
TCP/UDP
Stats





# Visibility















# What's on the truck?





# What's on the truck?





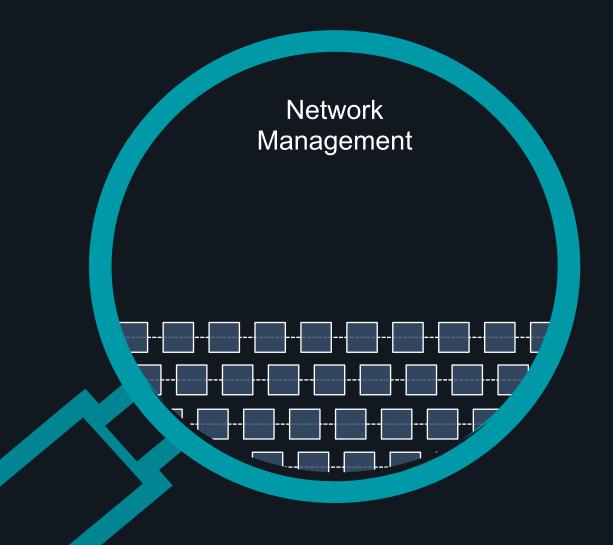




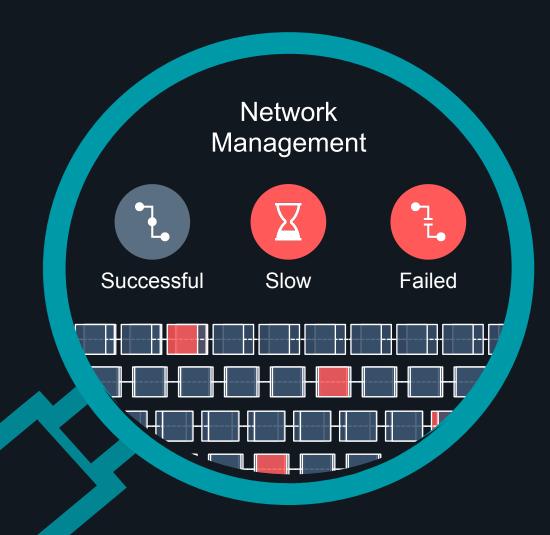




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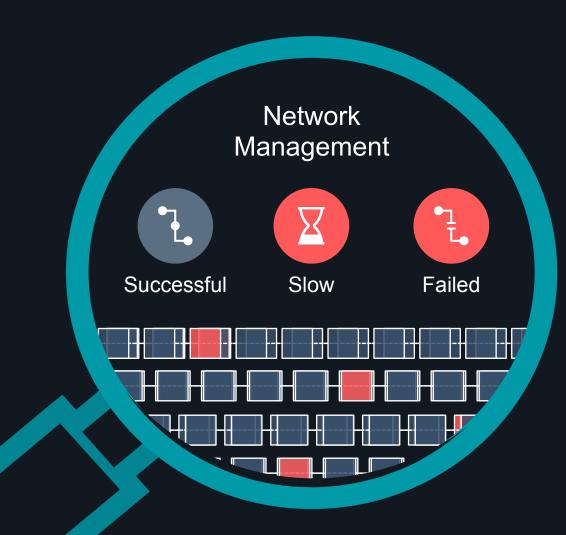


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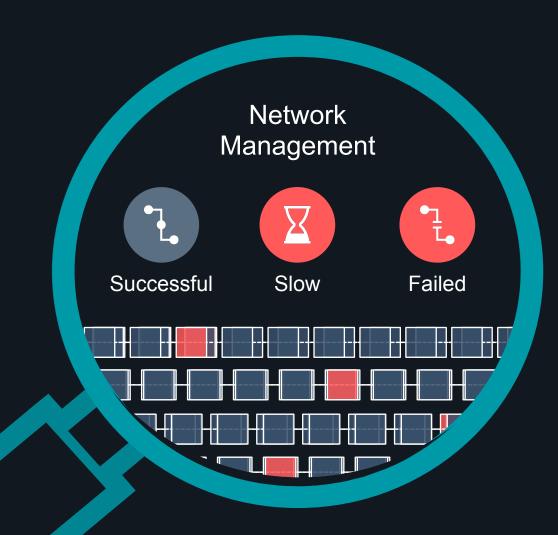
- Rich, multidimensional metadata
  - KPI, session, packet
- Advanced metrics
  - Application response time
  - Application success, failure
  - Application errors
  - Network response time
  - Per protocol, per message type (i.e., URL)
  - Voice and video QoE metrics
- Security metrics
  - Weak security practices (ciphers, protocols)
  - Threat analysis
  - Behavior analysis



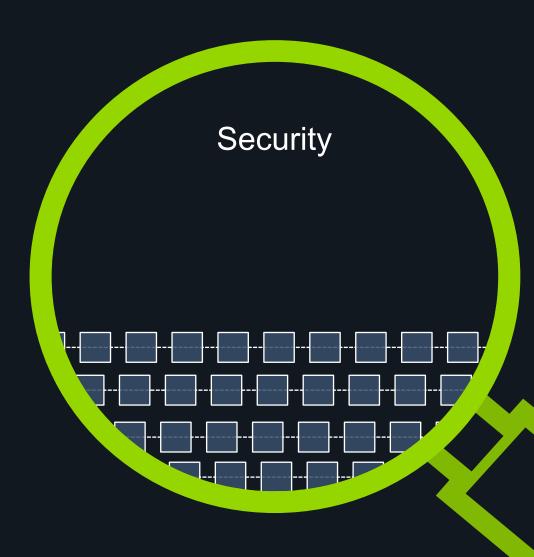




ASI
Smart Data
200+ Metrics (PKIs)







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### **Netflow data vs Full Packet Data**

### Do you need both?

- NetFlow data (or jFlow, sFlow IPFIX and other flow-based standards) provides a metadata-based view of activity on the network
- Full packet capture, on the other hand, is a complete record of actual network activity, including the
  actual data (packet payloads that are transferred across the network.)







# **Comparitive Overview**

### Packet analysis vs Flow analysis

#### Flow Analysis versus Packet Analysis - For Internet Monitoring

	Flow Analysis Tools	Packet Capture
Vendor agnostic	No	Yes
Username association	No	Yes
Accurate web domain reports	No	Yes
Resource (URI) names	No	Yes
Proxy reporting	No	Yes
Bandwidth usage	Yes	Yes
HTTP header analysis	No	Yes
Port 80 analysis	No	Yes
SMTP monitoring	No	Yes
BitTorrent decoding	No	Yes
DNS SPAM detection	No	Yes
Web client detection	No	Yes
Security/IDS	No	Yes
Passive hostname capture	No	Yes
Resource sizes (files)	No	Yes
Real-time data	Yes	Yes
Historical data	Yes	Yes

	Flow Analysis Tools	Packet Capture
Vendor agnostic	No	Yes
Deploy at any point in the network	No	Yes
Accurate application recognition	No	Yes
Username association	No	Yes
Drilldown from application to port number	No	Yes
Drilldown from application to user	No	Yes
True application names	No	Yes
Accurate web domain reports	No	Yes
Resource (URI) names	No	Yes
Proxy reporting	No	Yes
Bandwidth usage	Yes	Yes
HTTP header analysis	No	Yes
Port 80 analysis	No	Yes
SMTP monitoring	No	Yes
BitTorrent decoding	No	Yes
File activity monitoring	No	Yes
Passive hostname capture	No	Yes
Resource sizes (files)	No	Yes
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Historical data	Yes	Yes
Filter bandwidth usage by MAC address	No	Yes
Filter bandwidth usage by IP address	Yes	Yes
IP flow count reporting	Yes	Yes



# Packets vs Other Data Sources

The Ultimate Source of Truth



# **Packets vs Other Data Sources**

The Ultimate Source of Truth



DEEP PACKET INSPECTION



## **Packets vs Other Data Sources**

### The Ultimate Source of Truth



DEEP PACKET INSPECTION



REAL-TIME VISIBILITY



GRANUAL & DETAILED



ANOMOLY DETECTION





**FORENSICS** 



**COMPLIANCE** 



# **NETSCOUT.**

# Thank you.

Marc Meulensteen

Sr. Sales Engineer Enterprise

Marc.Meulensteen@netscout.com

netscout.com



# NETSCOUT.

Guardians of the Connected World

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March 2024



Guardians of the Connected World

Agenda

**Our Solutions** 

Service Assurance

nGenius Platform

Use cases

**Active Monitoring** 

## **Our Solutions**

### Powered by the Visibility Without Borders Platform



# nGenius Enterprise Performance Management

Mission Critical Apps

Remote and Hybrid Workforce

UCaaS and Collaboration

**Hybrid Multi-cloud Migration** 



#### nGenius Carrier-Grade Service Assurance

5G

Reduce OpEx

Automation



# Omnis Network Security

Comprehensive Network Visibility

Cyber Threat Detection

Ecosystem Integration



# Arbor DDoS Protection

Pervasive Network Visibility

Adaptive DDoS Protection

Global Threat Intelligence

The real-time network visibility platform for performance, availability, and security, at any scale.



# Visibility Without Borders Platform

### Our platform addresses

Mission-critical application performance

Data center transformation

Hybrid and multi-cloud environments

Remote and hybrid workforces

DDoS attacks

Slow security response

5G implementations

Our platform delivers

Real-time triage and retrospective investigation

Infinite multi-dimensional scalability

Deep packet inspection at scale

Visibility from the global internet to your local network

DDoS attack mitigation

A single-lens view of network and security activity

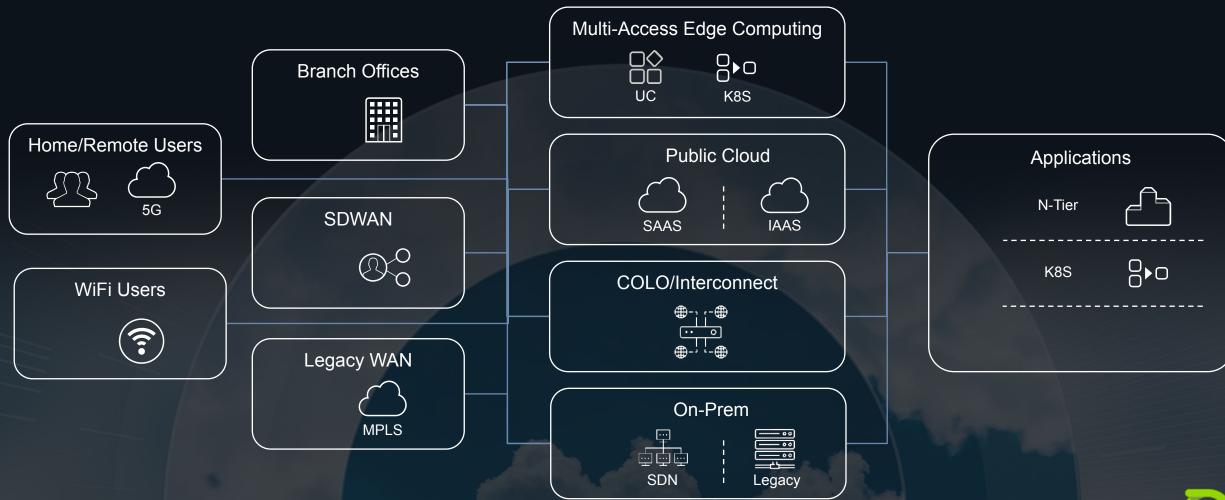




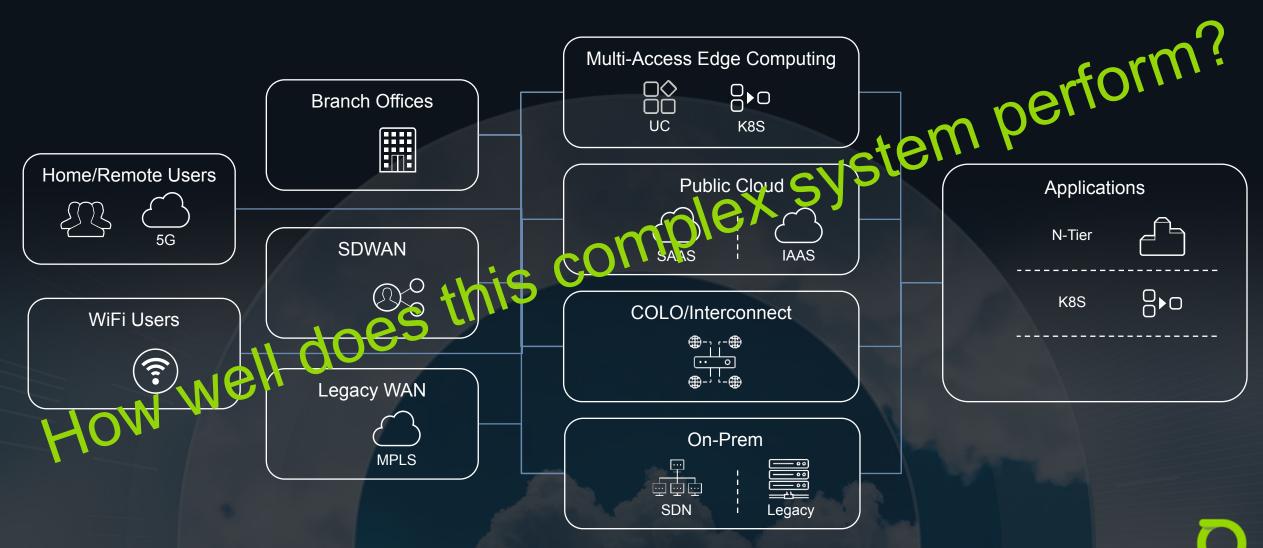
# Service Assurance



# **End-thru-End Visibility Without Borders**



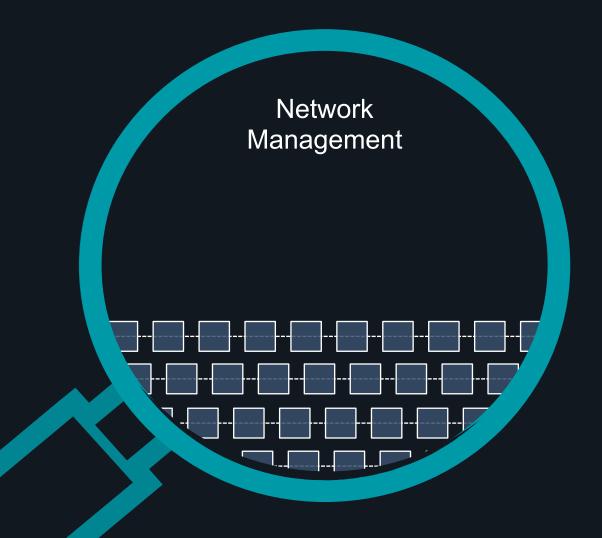
# **End-thru-End Visibility Without Borders**



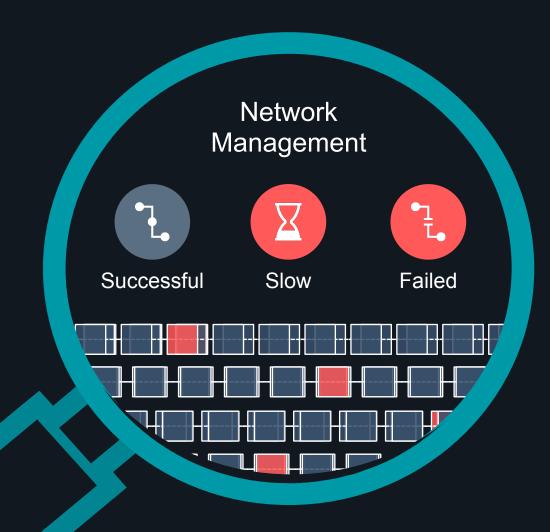
Network and Application Visibility & Performance



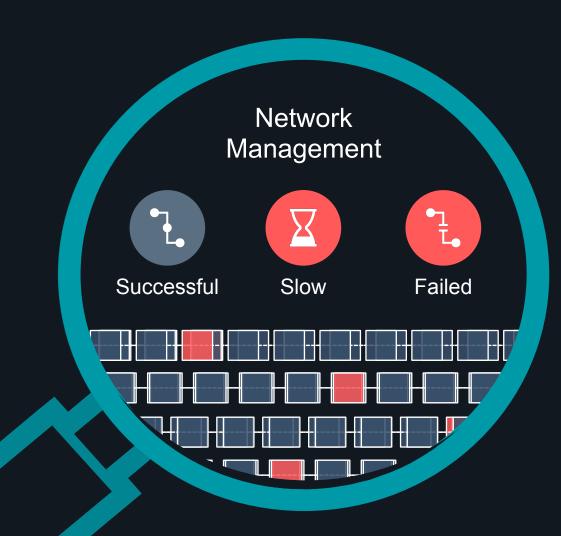
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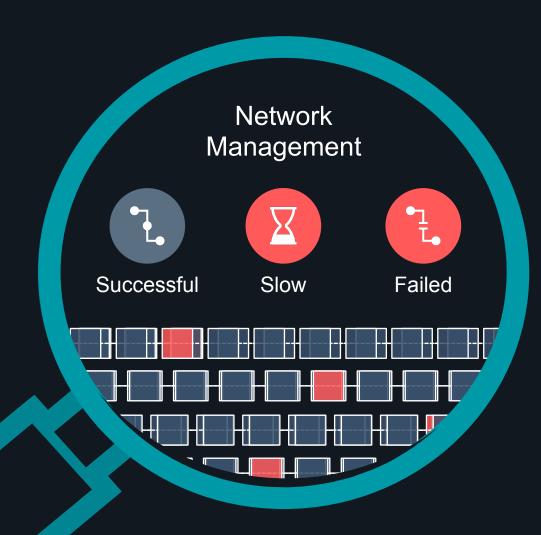


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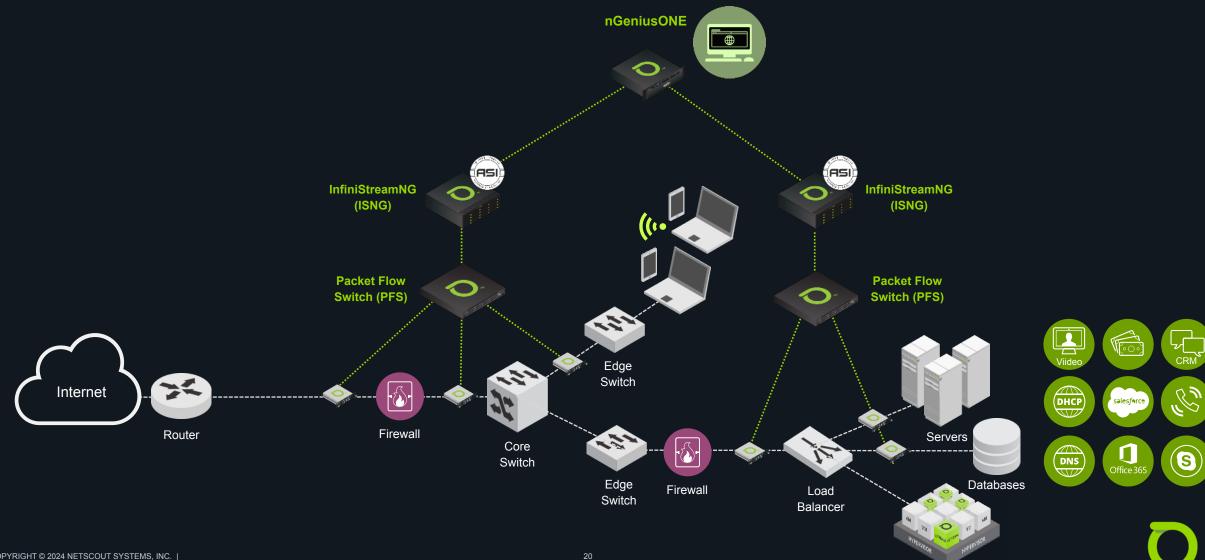




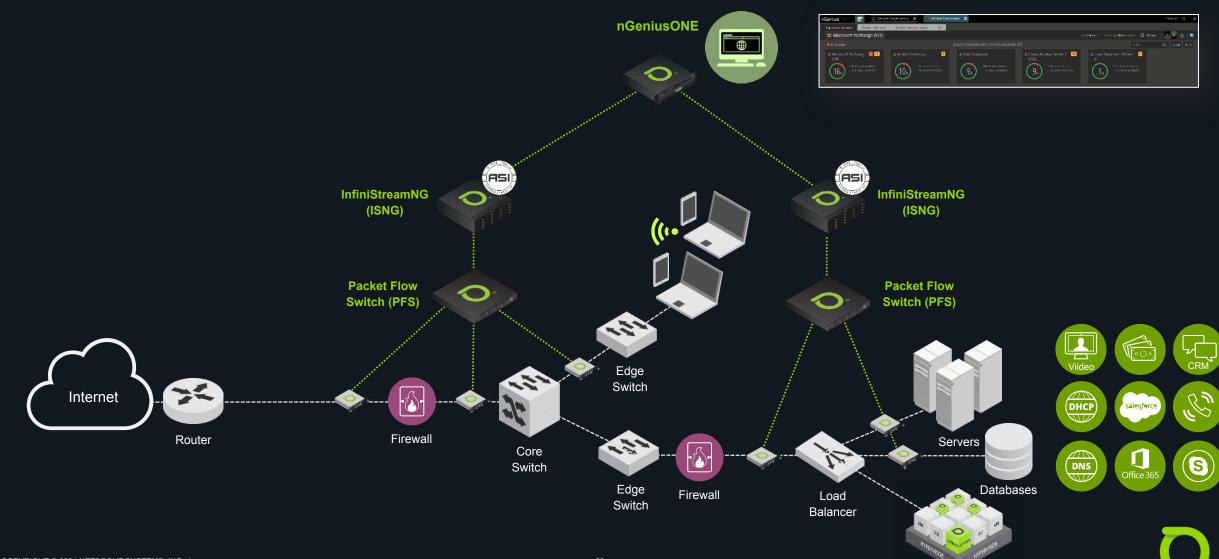
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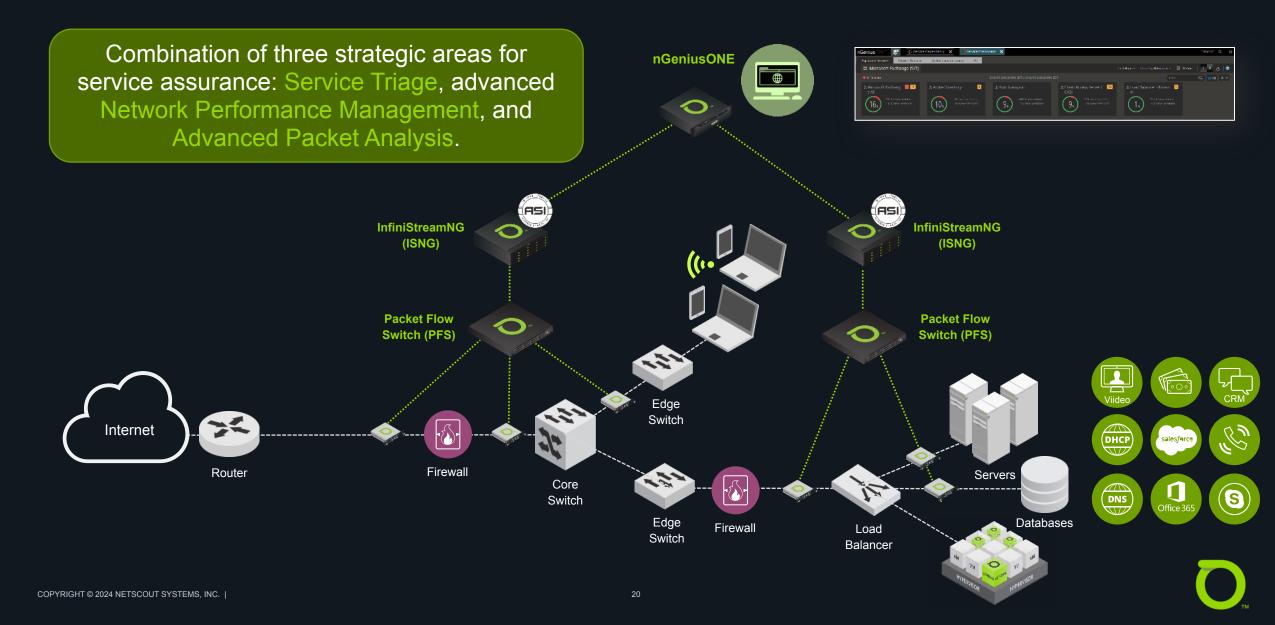
# **NETSCOUT nGenius Solution**



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# **NETSCOUT nGenius Solution**



#### nGeniusONE Service Triage Platform

### Service Dashboard and Alerts

Immediate visibility of problems in cloud, colo, data center, WFH, and office

#### **Service Monitor**

Layer-7, application focus for SaaS, UCaaS, business applications, service enablers

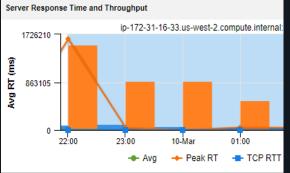
#### **Session Analysis**

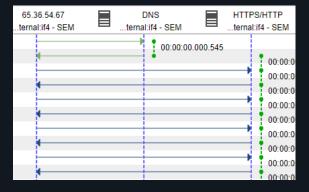
ASI metrics for fast targeting of cause

### **Packet Analysis**

Packets for evidence and collaboration







Codec	IP MOS Deg	Packet Loss
pus	0.61	5.16
pus	0.38	3.04
pus	0.70	6.14
pus	0.96	8.59



Sessions

**Packets** 

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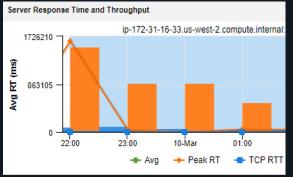
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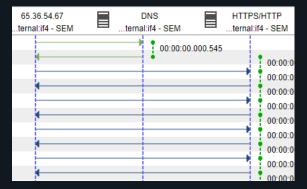
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Services

Sessions

Pag

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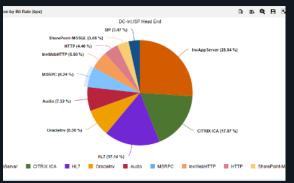
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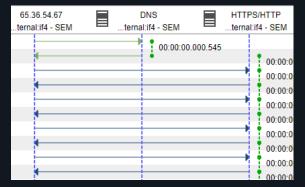
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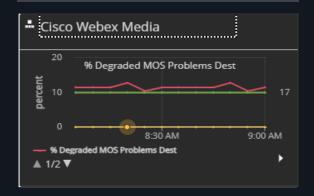
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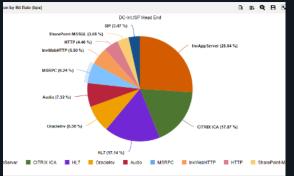
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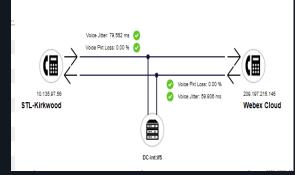
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Services

Sessions

Packets

#### **nGeniusONE** Service Triage Platform

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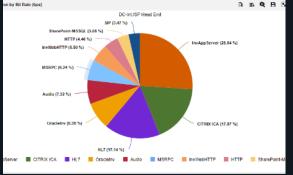
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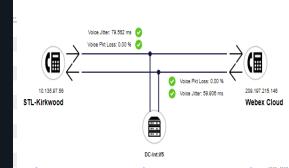
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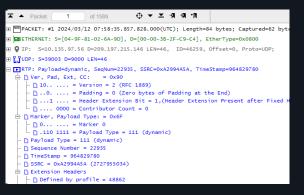
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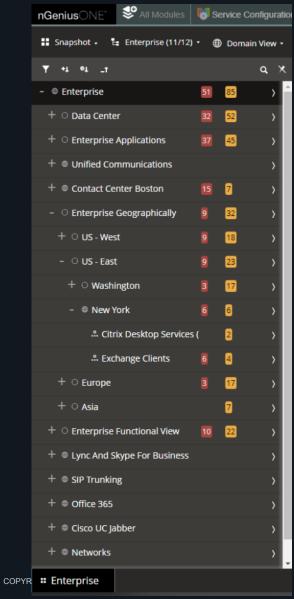








#### Dashboard: nGenius One



- Service hierarchy An organization of application services, network domains, and service domains in parent-child order configurable according to your needs
- Service domain A grouping of application services, network domains, and other service domains, designated by
- By default, at the top level, the Enterprise domain is the parent of all other domains.



#### Dashboard: nGenius One





# **Use Case: Troubleshooting**





# In case of alert

Notificat	tion Center	¥:05 P	M CET 1 Hour	(s) ◢   Ho	our 4   5:05 PM CET	Ϋ́			
Alerts Critical:	17 Warning: 16 Situa	tions 0							
	ID	Type	Occurrences	Acknowledge	Source	La	st Detected	Desc	cription
Service	e:Microsoft Teams Media	Threshold Alert	8	0/4	DC-Int:if5	02/29/2024 5	5:00:00.000 PM	Service Alert (Microsoft Teams Media)	
	145337240304	Threshold Alert	0		DC-Int:if5		5:00:00.000 PM	Absolute MOS Problems Dest for Service:Microsoft Teams Media (App: Microsoft Teal over a 5 minute period	ms RTP ; ServiceTest:MS Teams Join BTT - Okta) has exceeded the config threshold
Alert: 1-21453	337240304								
Severity:	★ Critical						Alert Metric Over	r Time	<b>≥</b> ∃ <b>%</b> ⊠
		ded the config thresho			s RTP ; ServiceTest:MS Teams elta = 24.27%; cumulative occur	rences since	Absolute MOS Problems Dest (%)  10 - 01 4:20 bM	4:55 PM  12:00 PM  Absolute MOS Problems Dest Threshold	5:00 PM 5:05 PM  13:00 PM 4:00 PM '5:  Absolute MOS Problems Dest
☐ 1-21	145337240305	Threshold Alert	0		DC-Int:if5	02/29/2024 5	5:00:00.000 PM	Absolute MOS Problems Src for Service:Microsoft Teams Media (App: Microsoft Team over a 5 minute period	ns RTP; ServiceTest:MS Teams Join BTT - Okta) has exceeded the config threshold
☐ 1-21	145337240273	Threshold Alert	3		DC-Int:if5	02/29/2024	4:45:00.000 PM		ms RTP; ServiceTest:MS Teams Join BTT - Okta) has repeatedly exceeded the config
☐ 1-21	145337240274	Threshold Alert	3		DC-Int:if5	02/29/2024	1:45:00.000 PM	Absolute MOS Problems Src for Service:Microsoft Teams Media (App: Microsoft Team threshold over a 4 hour period	ns RTP; ServiceTest:MS Teams Join BTT - Okta) has repeatedly exceeded the config
☐ ► Service	e:Microsoft Teams	Threshold Alert	16 19	0/14	DC-Int:if5	02/29/2024 5	5:00:00.000 PM	Service Alert (Microsoft Teams)	
☐ ► Service	e:Cisco Webex	Threshold Alert	29	0/3	DC-Int:if5	02/29/2024 5	5:05:00.000 PM	Service Alert (Cisco Webex)	
☐ ► Service	e:Office365 Outlook	Threshold Alert	36 48	0/7	DC-Int:if5	02/29/2024 5	5:05:00.000 PM	Service Alert (Office365 Outlook)	
☐ ► Service	e:Cisco Webex Media	Threshold Alert	24 24	0/4	DC-Int:if5	02/29/2024 5	5:05:00.000 PM	Service Alert (Cisco Webex Media)	
1-21453	337240291	Threshold Alert	12		DC-Int:if5	02/29/2024 5	5:05:00.000 PM	Avg. Response Time for Service:ServiceNow (App: nP-ServiceNow Web ; ServiceTest	t:ServiceNow Web) has repeatedly exceeded the config threshold over a 1 hour period



# What is the problem?



#### What is the problem?

- A Service outage
- A Service degradation
- End user experience is bad
- Capacity investigation
- An Event that increases the risk of a Service outage
- An Event that increases the risk of a Service degradation



#### MTTR

#### **Mean Time To Resolution** Incident Mean Time to Identify Start Verify Identify Mean Time to Verify Mean Time to Know Resolve Diagnose Mean Time to Resolve (MTTR) COPYRIGHT © 2024 NETSCOUT SYSTEMS, INC. |



#### nGenius: Reduce Mean Time to Resolution (MTTR) with Speed to Knowledge

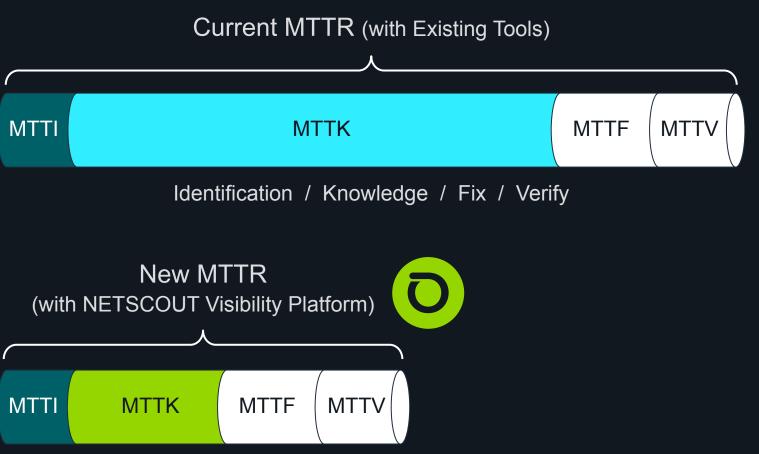
90% of mean time to resolution is spent in understanding the problem



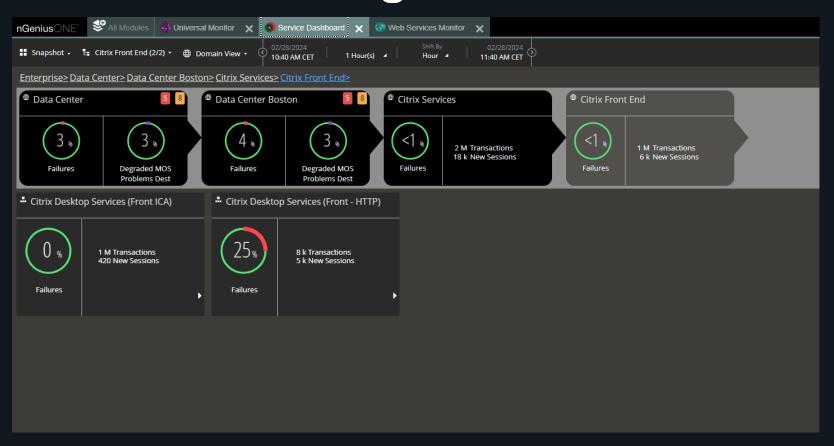


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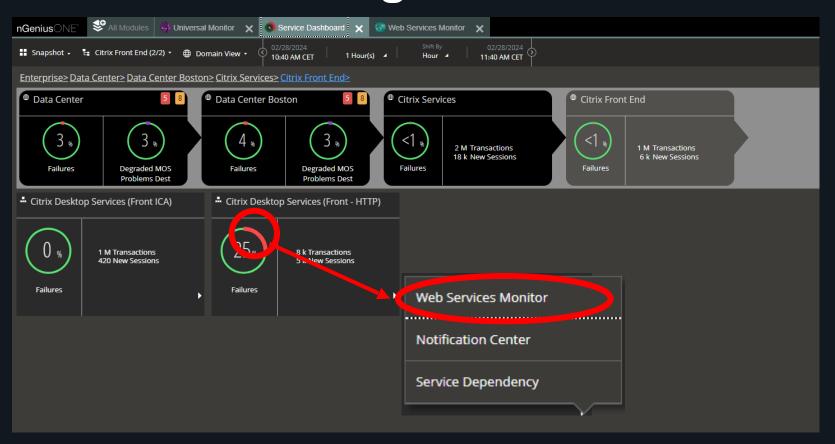
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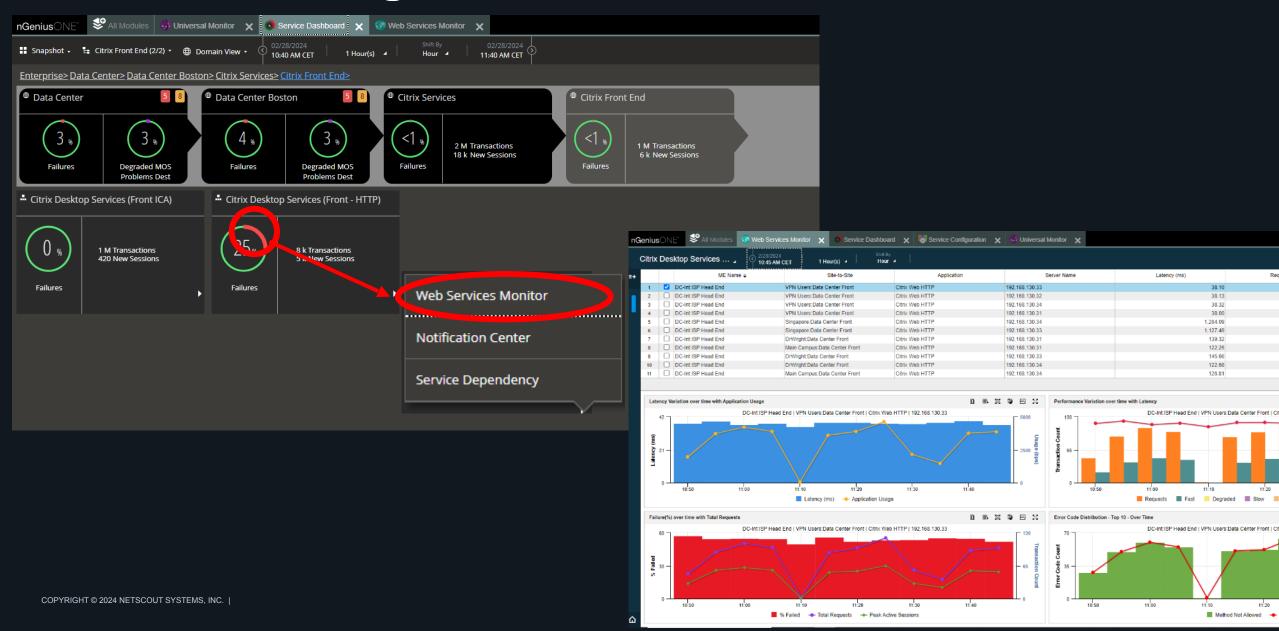


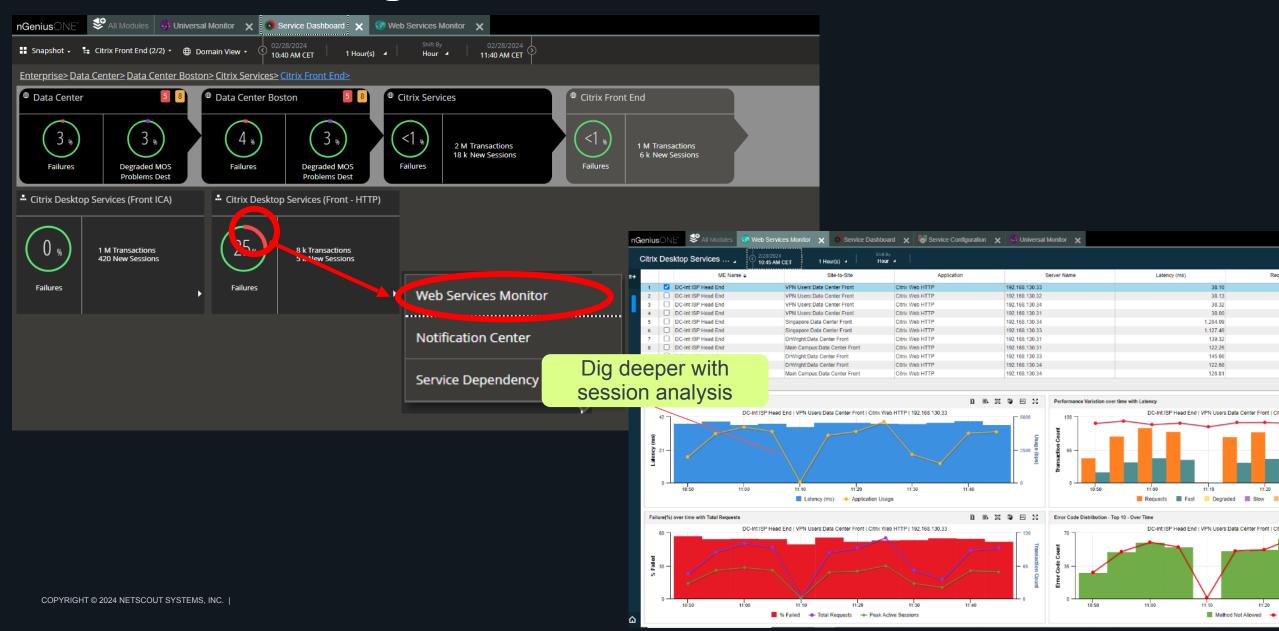


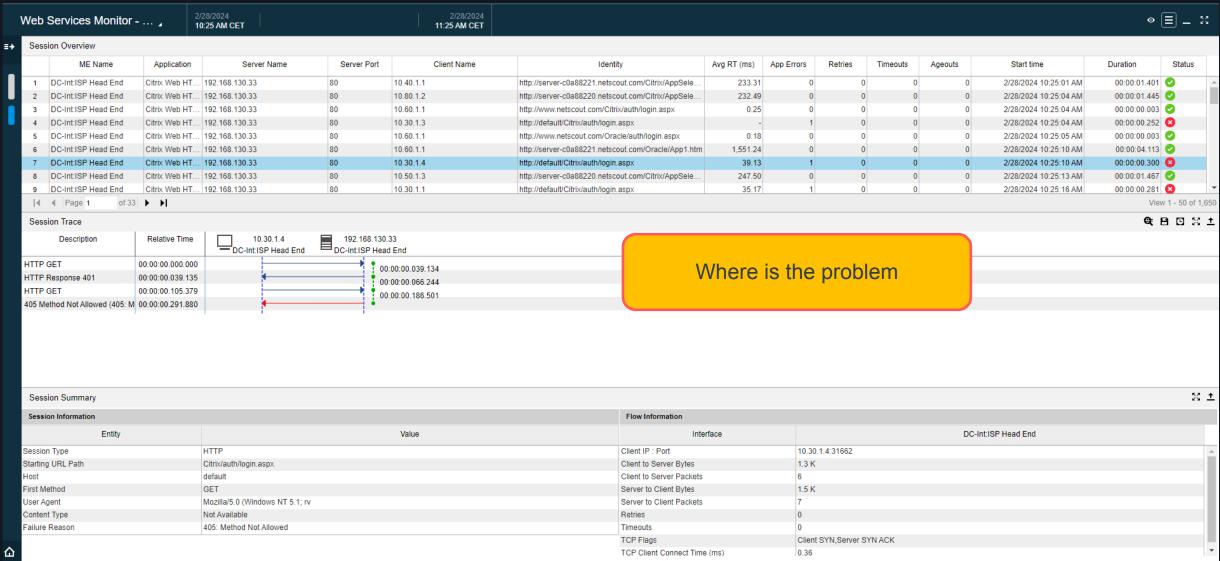


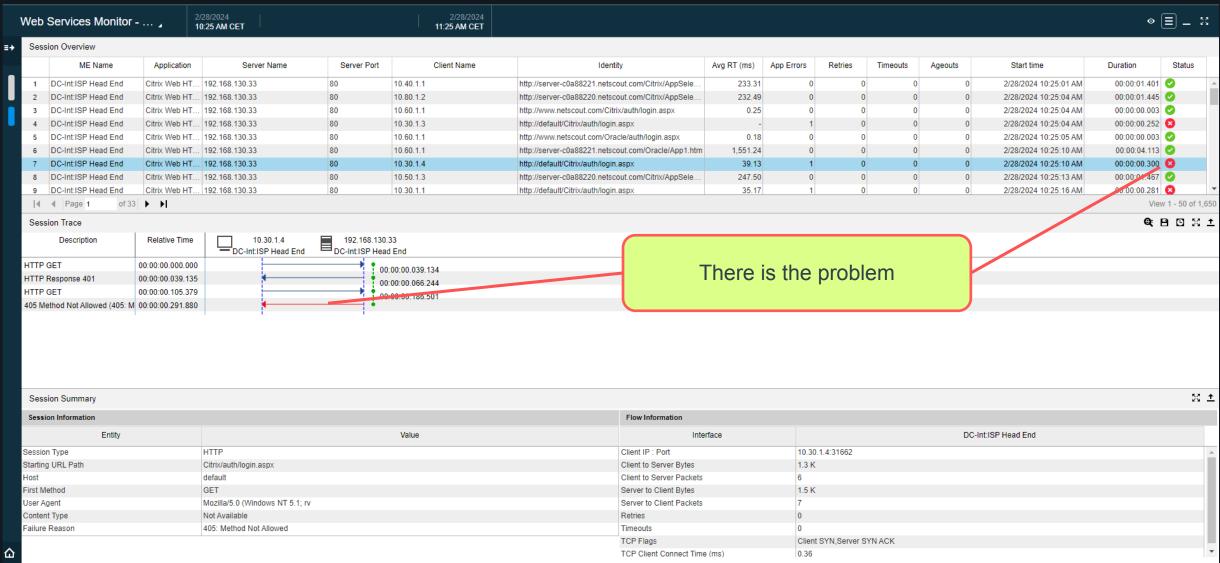


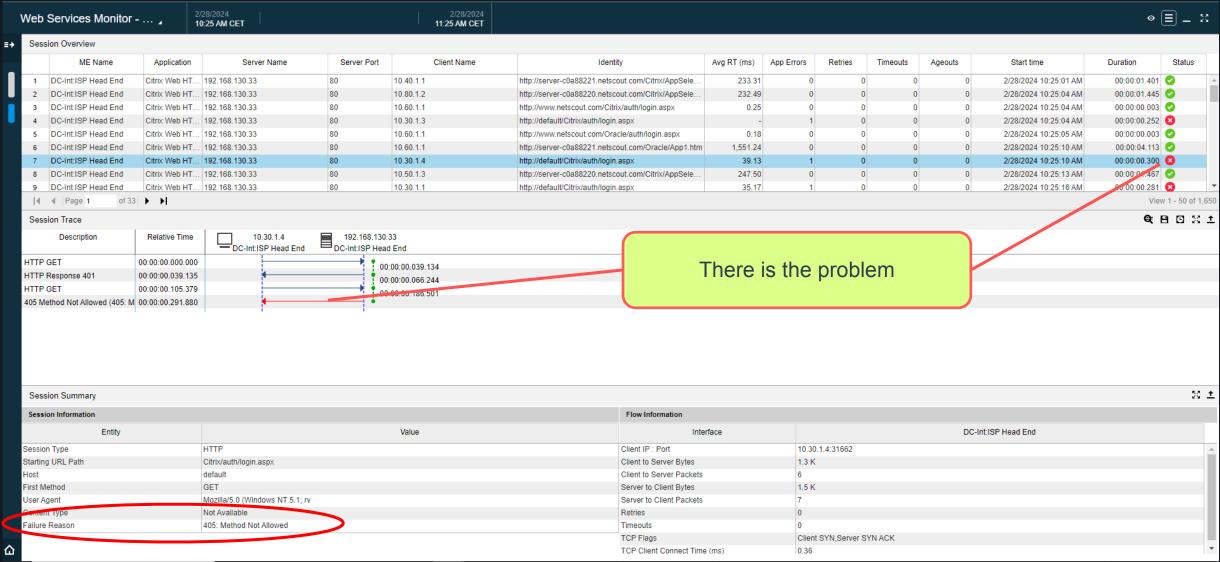


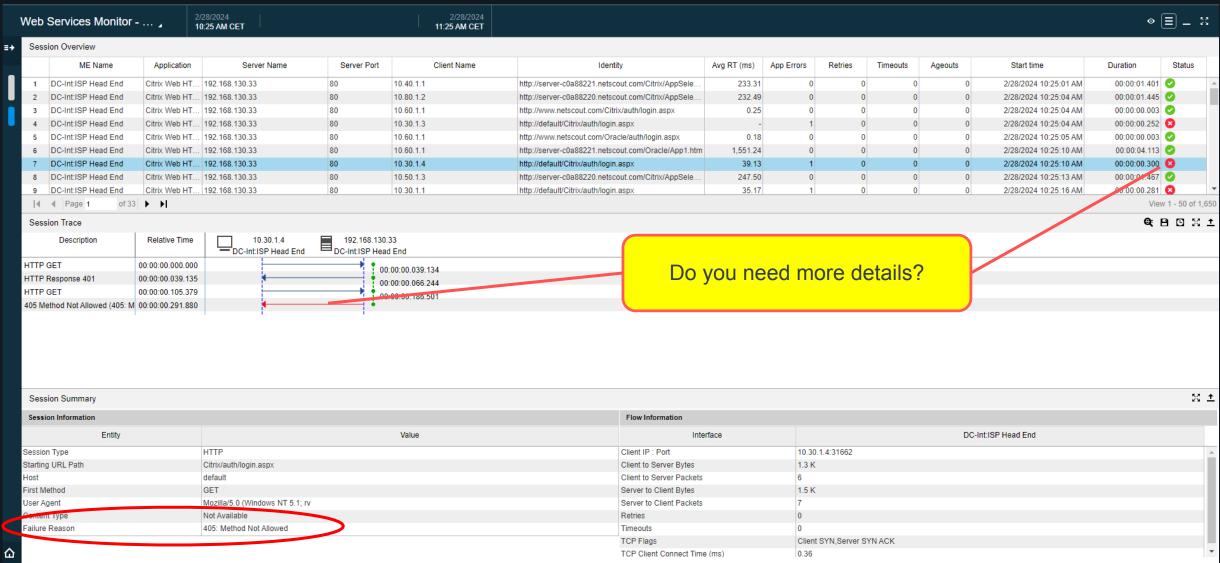


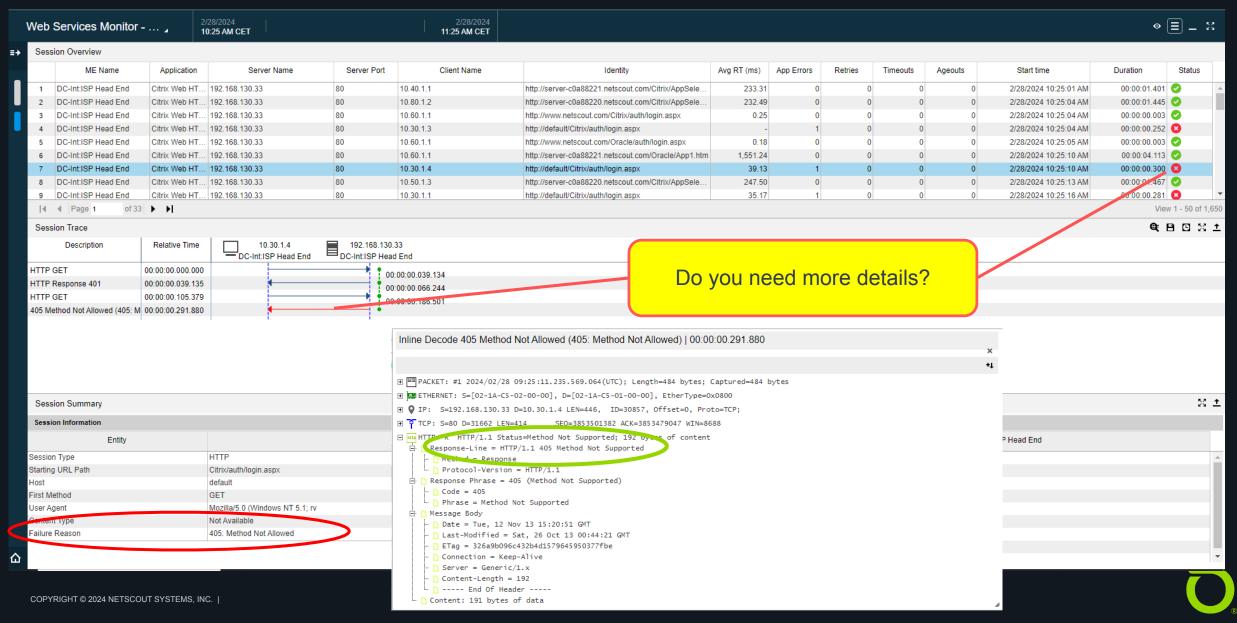








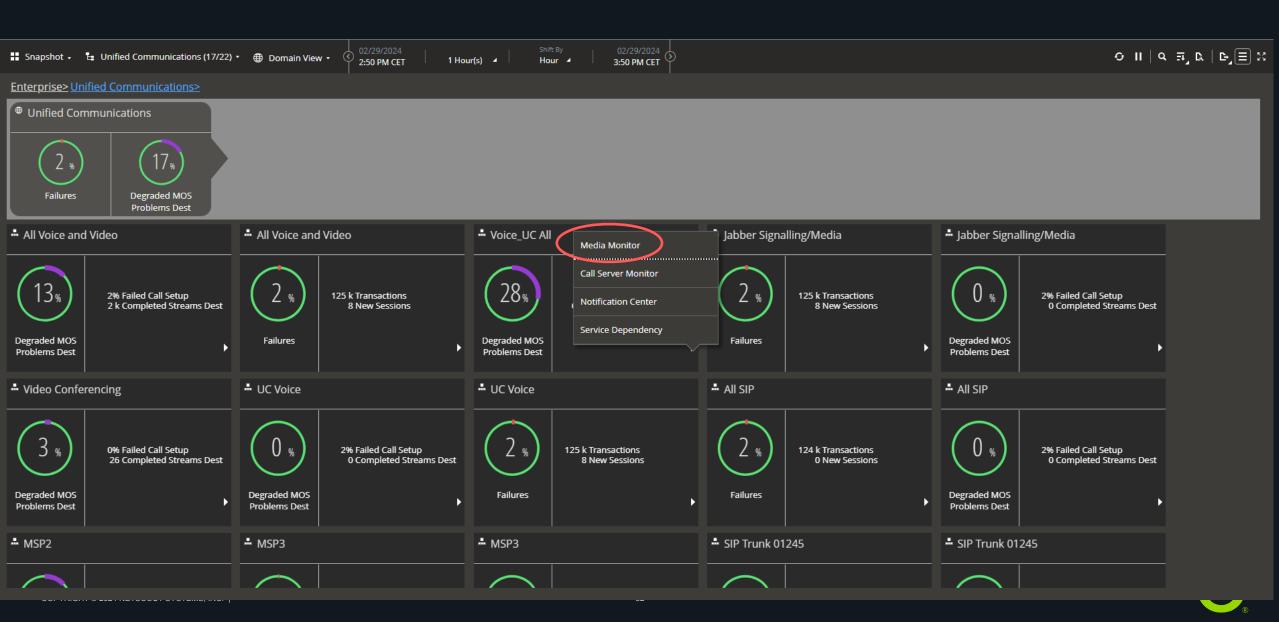


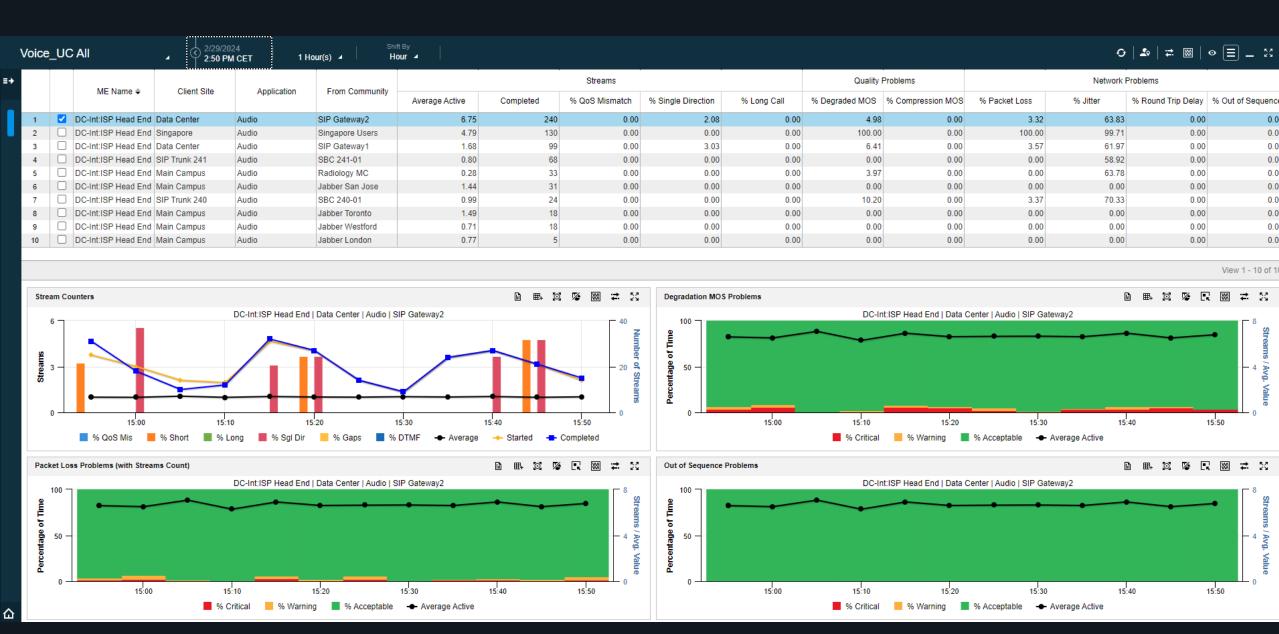


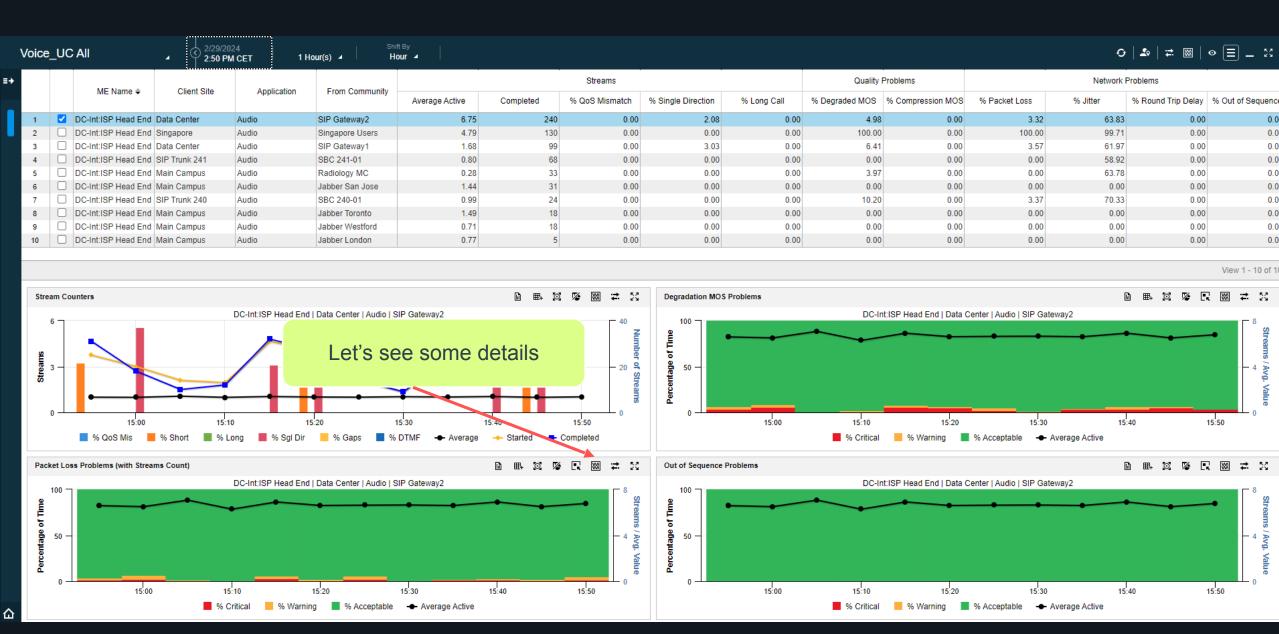
# **Use case: Voice Quality Monitoring**

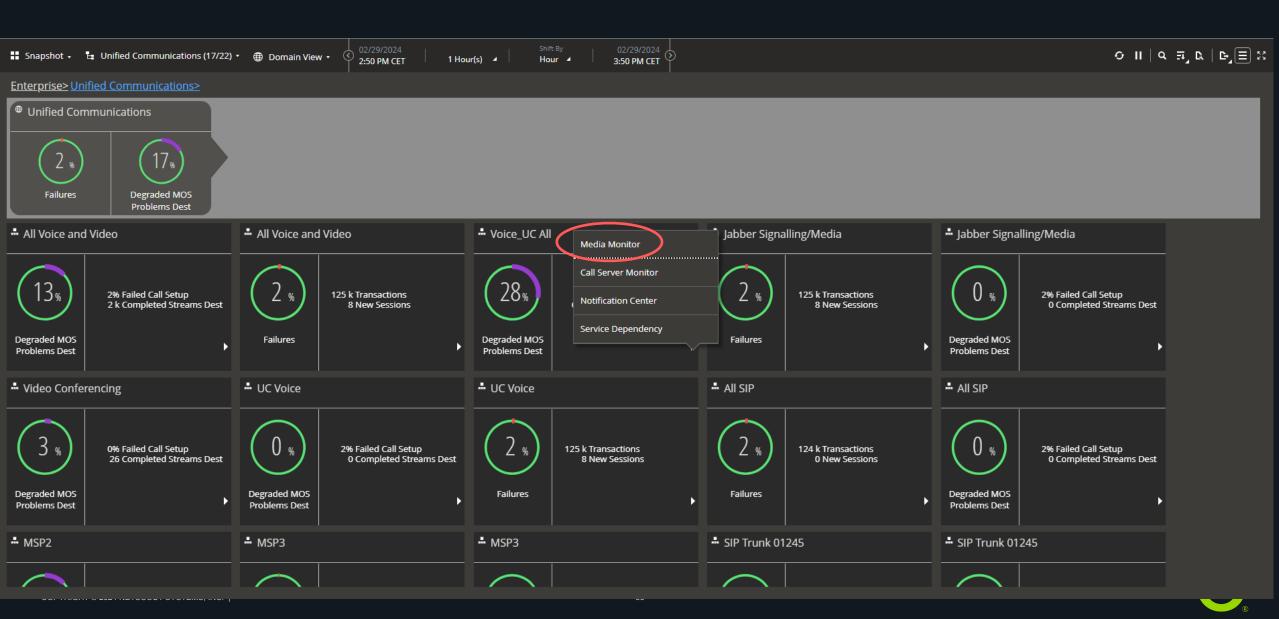








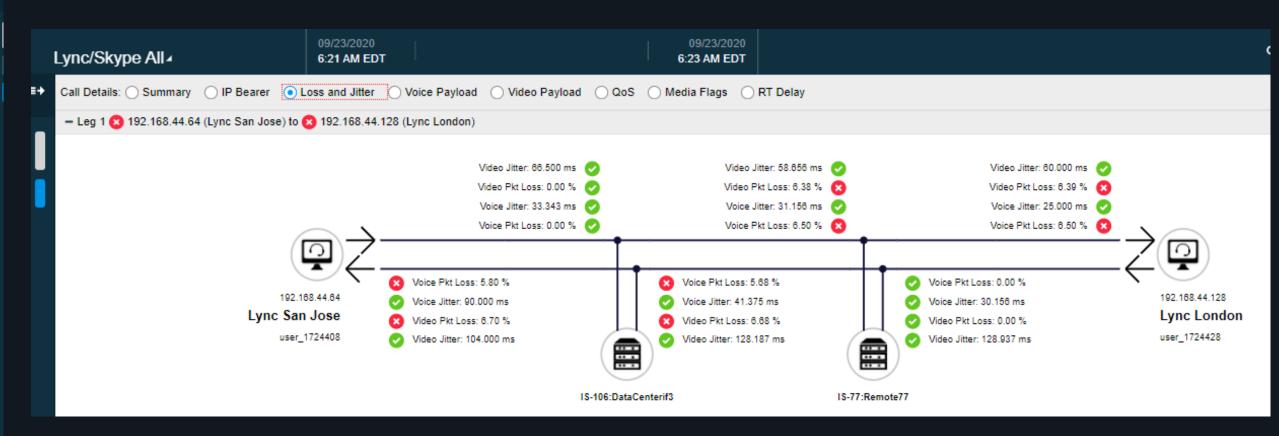




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2	•	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218	-	-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.03	-	0.00	9525.250	-	-	-
4	0	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	251.625	-	-	-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.87	0	G.711_A-law	0.00	-	0.00	6118.031	-	-	-
7	0	02/29/2024 3:45:04 PM	00:04:23	DC-Int:ISP Head End	192.168.105.105	10.60.6.87	0	G.711_A-law	0.02	-	0.05	497.531	-	-	-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.60.6.86	0	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	•	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	0	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	0	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	0	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	•	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	0	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	0	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	•	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	0	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	0	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
14 4	Dans	02/20/2024 2:20:22 PM	00-00-50	DO IntiOD Hand Ford	402 400 405 405	40.00.00		0.744 A I	0.00		0.00	405.000			Strooms 1 E0 of 204
14 4	Page 1	of 5 • •													Streams 1 - 50 of 2

Voice	_UC All		02/29/2024 2:50 PM CET		02/29/2024 3:50 PM CET									Q 5 0	<b>⊠ €,</b>   <b>⋄ ■</b>
→ Stream	s:   Summa	ary ONetwork OPaylo	oad Ogeneral O	) Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monito	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	***	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00		0.00	2208.781	-	-	-
2	•	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218	-	-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	0.711_A-law	0.03	-	0.00	9525.250	-	-	-
4	•	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-				3.729B	0.00	-	0.00	251.625	-	-	-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC	Single call	deen dive		\-law	0.00	-	0.00	6118.031	-	-	-
7	•	02/29/2024 3:45:04 PM	00:04:23	DC-	Olligic call	accp aive		\-law	0.02	-	0.05	497.531	-	-	-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Intilish Head Flug	192.108.105.105	10.00.0.80	U	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	•	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	•	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	•	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	•	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	•	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	•	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	9	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	•	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	0	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	•	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
<u> </u>	( De :	02/20/2024 2:20:22 PM	00-00-50	DO INVODUING FOR	402 400 405 405	40.00.00	^	0.744 4.1	0.00		0.00	405.000			Otrooms 4 50 -5004
ı  ∢ →	( Page 1	of 5 • •													Streams 1 - 50 of 201

Voice_L	JC All	4	02/29/2024 2:50 PM CET		02/29/2024 3:50 PM CET									9 0	
Streams: (	<ul><li>Summa</li></ul>	ary Network Paylo	oad Ogeneral	) Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monito	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	***	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00		0.00	2208.781	· /		-
2	0	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218		-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	5.711_A-law	0.03	-	0.00	9525.250		-	-
4	0	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-				3.729B	0.00		K.1				-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC	Single call	deen dive		\-law	0.00		No need	to go t	o pcap		-
7	•	02/29/2024 3:45:04 PM	00:04:23	DC	Offigic can	accp aive		\-law	0.02						-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Incise Head End	192.108.105.105	10.00.0.00	U	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	0	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	0	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	0	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	0	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	0	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	0	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	0	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	0	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	<b>②</b>	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	0	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
<u>^</u>	Dogo (	02/20/2024 2:20:22 PM	00-00-50	DO Ishiop Head Fee	402 400 405 405	40.00.000	0	0.744 A I	0.00		0.00	405.000			Streams 1 - 50 of 201
<b>7</b>   4   4	rage 1	of 5 • •													Streams 1 - 50 01 201



Voice_	_UC All	4	02/29/2024 2:50 PM CET		02/29/20 3: <b>50 PM C</b>									Q &   @	· - • • =
Streams	s:   Summ	ary ONetwork OPaylo	oad	Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monite	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	11)	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00	-	0.00	2208.781	-	-	- ^
2	0	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218	-	-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.03	-	0.00	9525.250	-	-	-
4	0	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	251.625	-	-	-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.87	0	G.711_A-law	0.00	-	0.00	6118.031	-	-	-
7	0	02/29/2024 3:45:04 PM	00:04:23	DC-Int:ISP Head End	192.168.105.105	10.60.6.87	0	G.711_A-law	0.02	-	0.05	497.531	-	-	-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.60.6.86	0	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	•	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	0	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	0	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	0	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	•	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	0	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	0	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	•	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	0	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	0	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
14 4	Dans	02/20/2024 2:20:22 PM	00-00-50	DO IntiOD Hand Ford	402 400 405 405	40.00.00		0.744 A I	0.00		0.00	405.000			Strooms 1 E0 of 204
14 4	Page 1	of 5 • •													Streams 1 - 50 of 2

Voice	_UC All		02/29/2024 2:50 PM CET		02/29/2024 3:50 PM CET									Q 5 0	<b>⊠ €,</b>   ◊ <b>□</b>
→ Stream	s:   Summa	ary ONetwork OPaylo	oad Ogeneral O	) Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monito	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	***	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00		0.00	2208.781	-	-	-
2	•	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218	-	-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	0.711_A-law	0.03	-	0.00	9525.250	-	-	-
4	•	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-				3.729B	0.00	-	0.00	251.625	-	-	-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC	Single call	deen dive		\-law	0.00	-	0.00	6118.031	-	-	-
7	•	02/29/2024 3:45:04 PM	00:04:23	DC·	Olligic call	accp aive		\-law	0.02	-	0.05	497.531	-	-	-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Intilish Head Flug	192.108.105.105	10.00.0.80	U	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	•	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	•	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	•	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	•	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	•	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	•	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	9	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	•	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	0	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	•	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
<u> </u>	( De :	02/20/2024 2:20:22 PM	00-00-50	DO INVODUING FOR	402 400 405 405	40.00.00	^	0.744 4.1	0.00		0.00	405.000			Otrooms 4 50 -5004
ı  ∢ →	( Page 1	of 5 • •													Streams 1 - 50 of 201

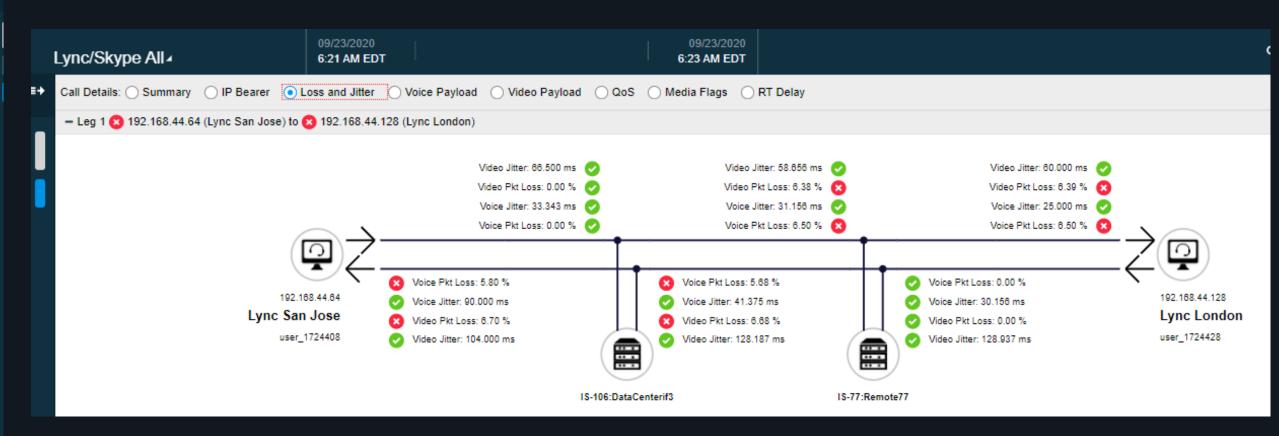
Voice_L	JC All	4	02/29/2024 2:50 PM CET		02/29/2024 3:50 PM CET									9 0	
Streams: (	<ul><li>Summa</li></ul>	ary Network Paylo	oad Ogeneral	) Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monito	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	***	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00		0.00	2208.781	· /		-
2	0	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218		-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	5.711_A-law	0.03	-	0.00	9525.250		-	-
4	0	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-				3.729B	0.00		K.1				-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC	Single call	deen dive		\-law	0.00		No need	to go t	o pcap		-
7	•	02/29/2024 3:45:04 PM	00:04:23	DC	Offigic can	accp aive		\-law	0.02						-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Incise Head End	192.108.105.105	10.00.0.00	U	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	0	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	0	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	0	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	0	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	0	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	0	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	0	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	0	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	<b>②</b>	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	0	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
<u>^</u>	Dogo (	02/20/2024 2:20:22 PM	00-00-50	DO Ishiop Head Fee	402 400 405 405	40.00.000	0	0.744 A I	0.00		0.00	405.000			Streams 1 - 50 of 201
<b>7</b>   4   4	rage 1	of 5 • •													Streams 1 - 50 01 201

Voice_	_UC All	4	02/29/2024 2:50 PM CET		02/29/20 3: <b>50 PM C</b>									Q &   @	· - • • =
Streams	s:   Summ	ary ONetwork OPaylo	oad	Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monite	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	11)	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00	-	0.00	2208.781	-	-	- ^
2	0	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218	-	-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.03	-	0.00	9525.250	-	-	-
4	0	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	251.625	-	-	-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.87	0	G.711_A-law	0.00	-	0.00	6118.031	-	-	-
7	0	02/29/2024 3:45:04 PM	00:04:23	DC-Int:ISP Head End	192.168.105.105	10.60.6.87	0	G.711_A-law	0.02	-	0.05	497.531	-	-	-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.60.6.86	0	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	•	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	0	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	0	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	0	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	•	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	0	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	0	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	•	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	0	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	0	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
14 4	Dans	02/20/2024 2:20:22 PM	00-00-50	DO IntiOD Hand Ford	402 400 405 405	40.00.00		0.744 A I	0.00		0.00	405.000			Strooms 1 E0 of 204
14 4	Page 1	of 5 • •													Streams 1 - 50 of 2

Voice	_UC All		02/29/2024 2:50 PM CET		02/29/2024 3:50 PM CET									Q 5 0	<b>⊠ €,</b>   ◊ <b>□</b>
→ Stream	s:   Summa	ary ONetwork OPaylo	oad Ogeneral O	) Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monito	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	***	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00		0.00	2208.781	-	-	-
2	•	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218	-	-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	0.711_A-law	0.03	-	0.00	9525.250	-	-	-
4	•	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-				3.729B	0.00	-	0.00	251.625	-	-	-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC	Single call	deen dive		\-law	0.00	-	0.00	6118.031	-	-	-
7	•	02/29/2024 3:45:04 PM	00:04:23	DC-	Olligic call	accp aive		\-law	0.02	-	0.05	497.531	-	-	-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Intilish Head Flug	192.108.105.105	10.00.0.80	U	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	•	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	•	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	•	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	•	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	•	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	•	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	9	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	•	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	0	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	•	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
<u> </u>	( De :	02/20/2024 2:20:22 PM	00-00-50	DO INVODUING FOR	402 400 405 405	40.00.00	^	0.744 4.1	0.00		0.00	405.000			Otrooms 4 50 -5004
ı  ∢ →	( Page 1	of 5 • •													Streams 1 - 50 of 201

Voice_L	JC All	4	02/29/2024 2:50 PM CET		02/29/2024 3:50 PM CET									9 0	
Streams: (	<ul><li>Summa</li></ul>	ary Network Paylo	oad Ogeneral	) Extremes											
	Status	Start Time 🛊	Duration	ME Name	Src IP	Dest IP	QoS	Codec	IP MOS Deg	Comp Deg	Packet Loss	Max Jitter	End-to-end RT De	Source-to-monito	RTCP Packet Los:
1	8	02/29/2024 3:49:20 PM	***	DC-Int:ISP Head End	192.168.105.105	10.60.6.83	0	G.711_A-law	0.00		0.00	2208.781	· /		-
2	0	02/29/2024 3:47:15 PM	***	DC-Int:ISP Head End	192.168.105.105	10.70.7.72	0	G.729/G.729B	0.00	-	0.00	357.218		-	-
3	8	02/29/2024 3:46:35 PM	***	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	5.711_A-law	0.03	-	0.00	9525.250		-	-
4	0	02/29/2024 3:46:29 PM	00:00:32	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.00	-	0.00	210.343	-	-	-
5	•	02/29/2024 3:45:14 PM	00:00:35	DC-				3.729B	0.00		K.1				-
6	8	02/29/2024 3:45:09 PM	00:04:18	DC	Single call	deen dive		\-law	0.00		No need	to go t	o pcap		-
7	•	02/29/2024 3:45:04 PM	00:04:23	DC	Offigic can	accp aive		\-law	0.02						-
8	8	02/29/2024 3:45:03 PM	00:04:17	DC-Incise Head End	192.108.105.105	10.00.0.00	U	G.711_A-law	0.03	-	0.05	525.406	-	-	-
9	8	02/29/2024 3:45:01 PM	00:04:09	DC-Int:ISP Head End	192.168.105.105	10.60.6.88	0	G.711_A-law	0.04	-	0.28	724.187	-	-	-
10	8	02/29/2024 3:44:53 PM	00:04:11	DC-Int:ISP Head End	192.168.105.105	10.60.6.109	0	G.711_A-law	0.02	-	0.07	737.500	-	-	-
11	0	02/29/2024 3:44:41 PM	00:00:31	DC-Int:ISP Head End	192.168.105.105	10.30.3.71	0	G.729/G.729B	0.47	-	3.06	250.843	-	-	-
12	0	02/29/2024 3:43:22 PM	00:00:33	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	233.031	-	-	-
13	8	02/29/2024 3:42:16 PM	00:04:17	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.12	-	0.67	6213.156	-	-	-
14	0	02/29/2024 3:41:46 PM	00:01:09	DC-Int:ISP Head End	192.168.105.105	10.20.2.74	0	G.729/G.729B	0.00	-	0.00	367.156	-	-	-
15	8	02/29/2024 3:40:52 PM	00:04:08	DC-Int:ISP Head End	192.168.105.105	10.60.6.97	0	G.711_A-law	0.12	-	5.22	425.875	-	-	-
16	0	02/29/2024 3:40:46 PM	00:04:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.07	-	2.72	431.656	-	-	-
17	0	02/29/2024 3:40:45 PM	00:04:06	DC-Int:ISP Head End	192.168.105.105	10.60.6.104	0	G.711_A-law	0.00	-	0.00	491.562	-	-	-
18	8	02/29/2024 3:40:43 PM	00:04:20	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.11	-	5.40	362.156	-	-	-
19	0	02/29/2024 3:40:34 PM	00:04:18	DC-Int:ISP Head End	192.168.105.105	10.60.6.70	0	G.711_A-law	0.06	-	0.16	329.156	-	-	-
20	8	02/29/2024 3:40:22 PM	00:00:29	DC-Int:ISP Head End	192.168.105.105	10.60.6.71	0	G.711_A-law	1.32	-	1.19	271.968	-	-	-
21		02/29/2024 3:40:20 PM	00:00:14	DC-Int:ISP Head End	192.168.105.105	10.60.6.75	0	G.711_A-law	-	-	-	-	-	-	-
22	0	02/29/2024 3:40:20 PM	00:00:21	DC-Int:ISP Head End	192.168.105.105	10.60.6.106	0	G.711_A-law	0.00	-	0.00	289.687	-	-	-
23	8	02/29/2024 3:40:20 PM	00:00:42	DC-Int:ISP Head End	192.168.105.105	10.70.7.71	0	G.729/G.729B	0.11	-	0.69	586.031	-	-	-
24		02/29/2024 3:40:19 PM	00:00:01	DC-Int:ISP Head End	192.168.105.105	10.20.2.70	0	G.729/G.729B	-	-	-	-	-	-	-
25	0	02/29/2024 3:40:19 PM	00:01:51	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	0.05	-	0.29	277.312	-	-	-
26		02/29/2024 3:40:16 PM	00:00:03	DC-Int:ISP Head End	192.168.105.105	10.240.0.1	46	G.711_A-law	-	-	-	-	-	-	-
27	<b>②</b>	02/29/2024 3:39:48 PM	00:00:16	DC-Int:ISP Head End	192.168.105.105	10.30.3.74	0	G.729/G.729B	0.00	-	0.00	158.312	-	-	-
28	0	02/29/2024 3:39:24 PM	00:00:55	DC-Int:ISP Head End	192.168.105.105	10.60.6.74	0	G.711_A-law	0.00	-	0.00	219.031	-	-	-
<u>^</u>	Dogo (	02/20/2024 2:20:22 PM	00-00-50	DO Ishiop Head Fee	402 400 405 405	40.00.000	0	0.744 A I	0.00		0.00	405.000			Streams 1 - 50 of 201
<b>7</b>   4   4	rage 1	of 5 • •													Streams 1 - 50 01 201

## "Who can hear who? I can't hea..."

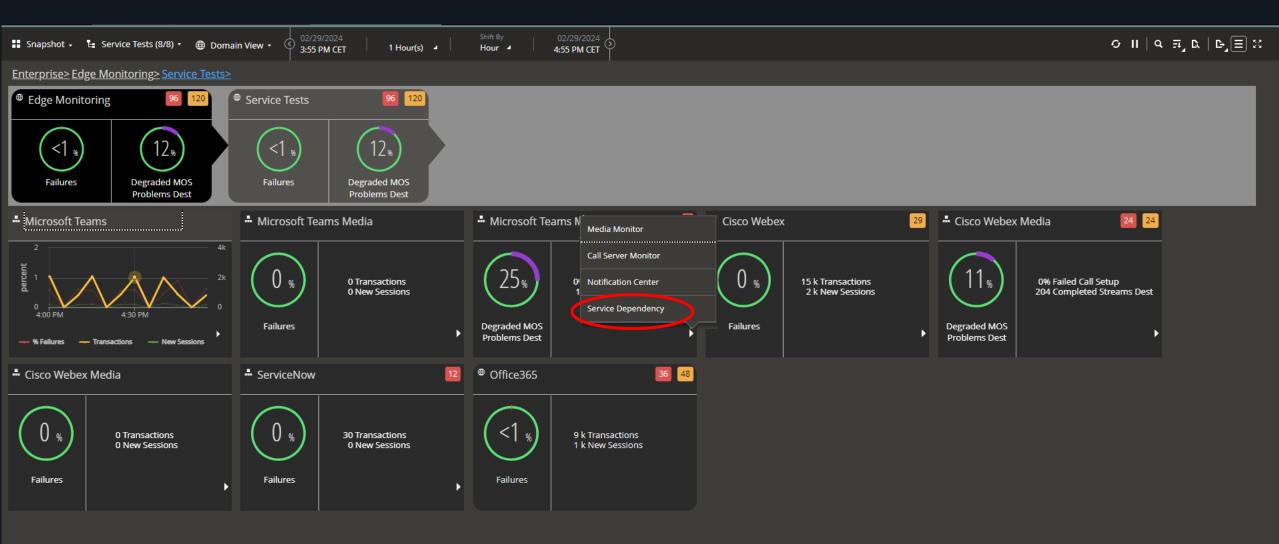


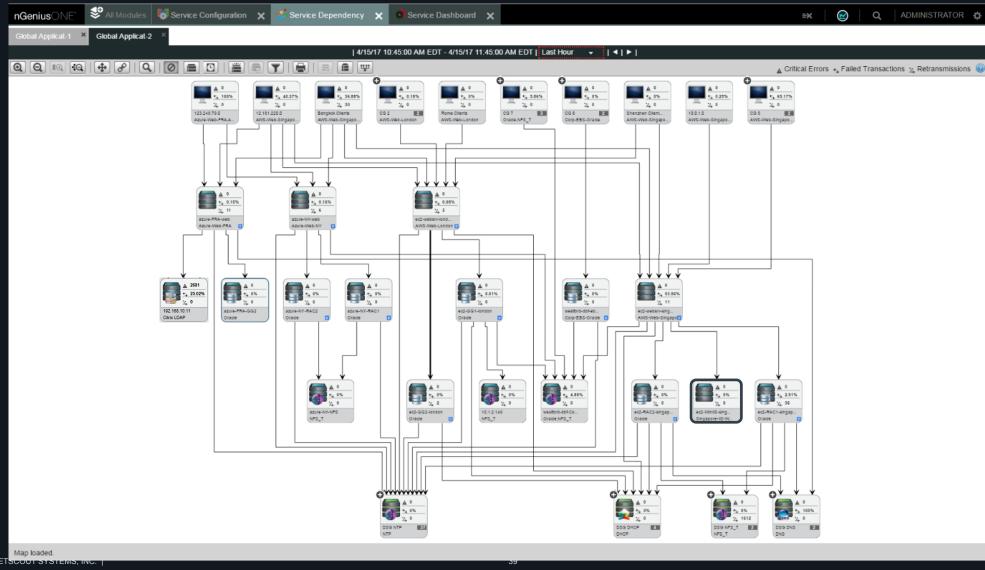
# **Use case: Network visibility**



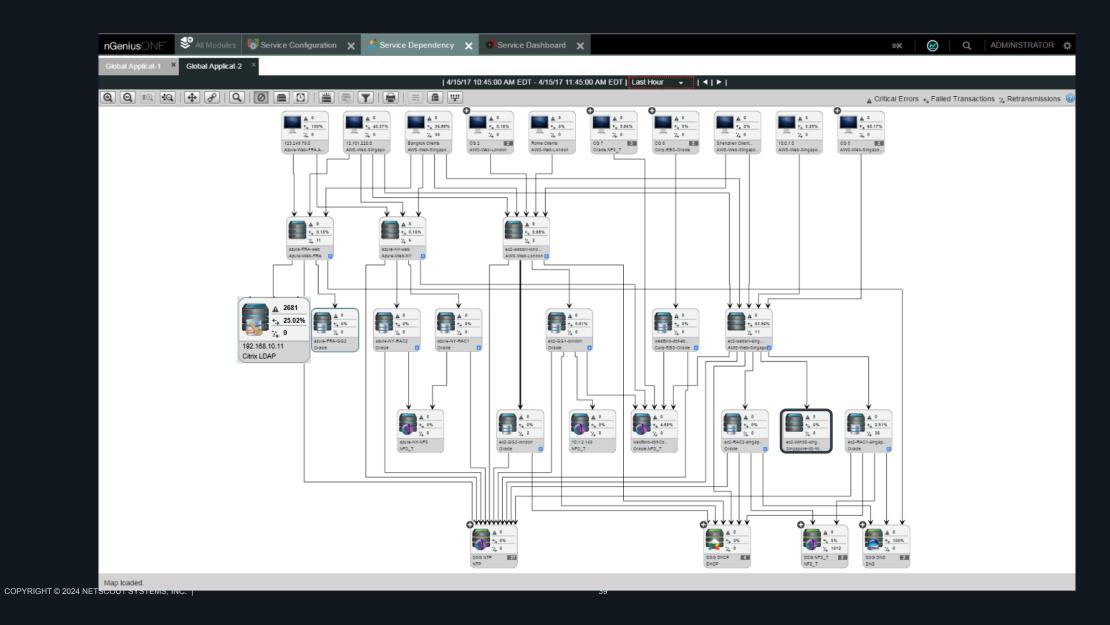


# Service dependency

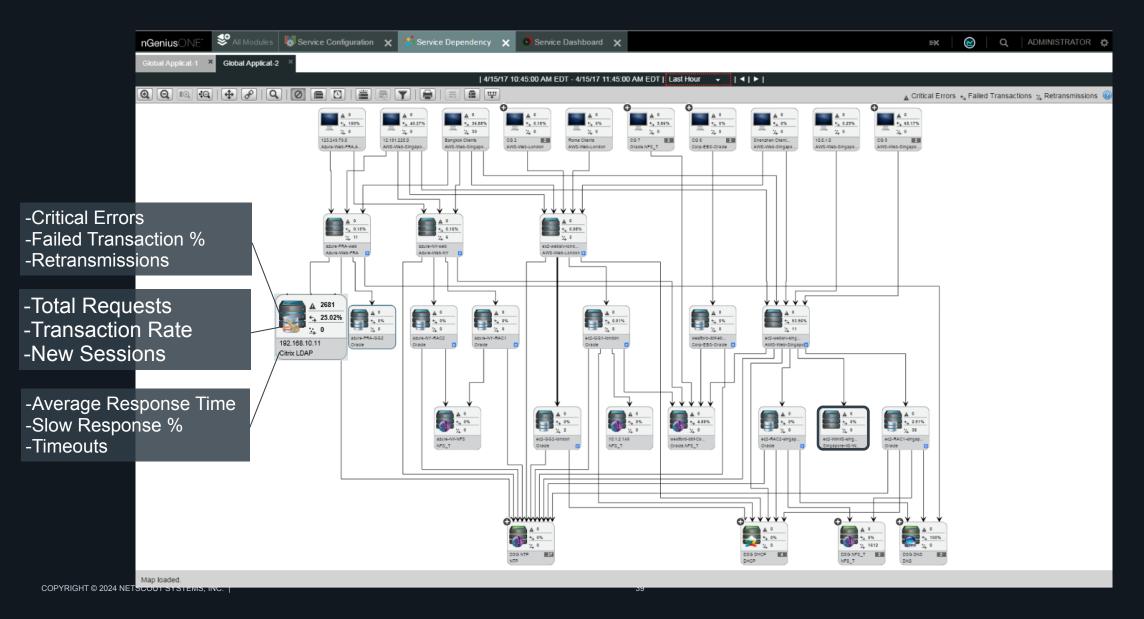




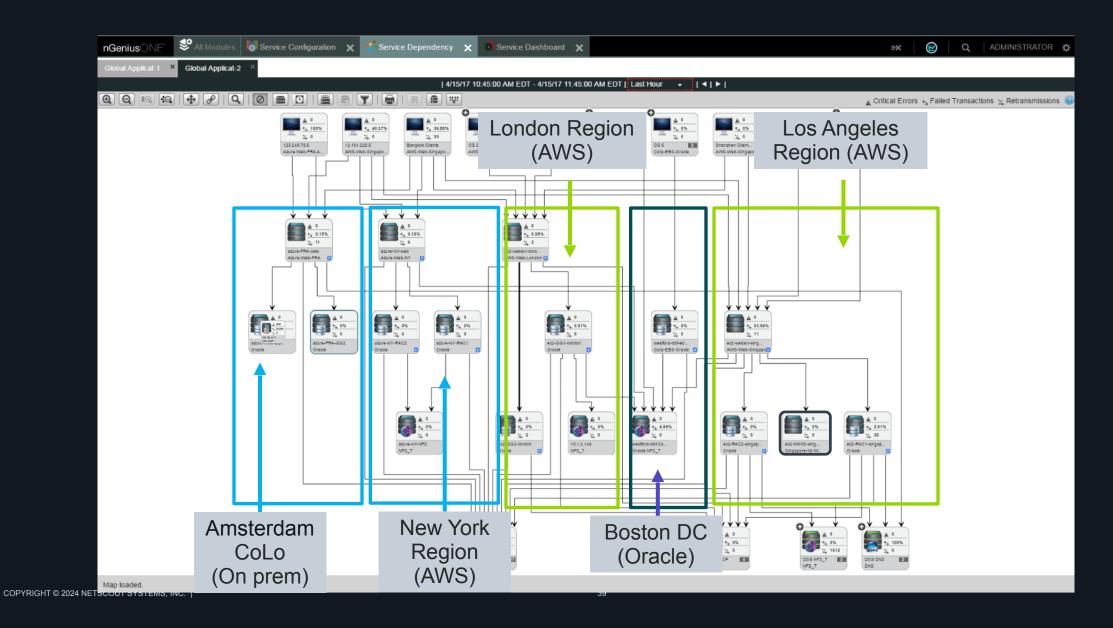




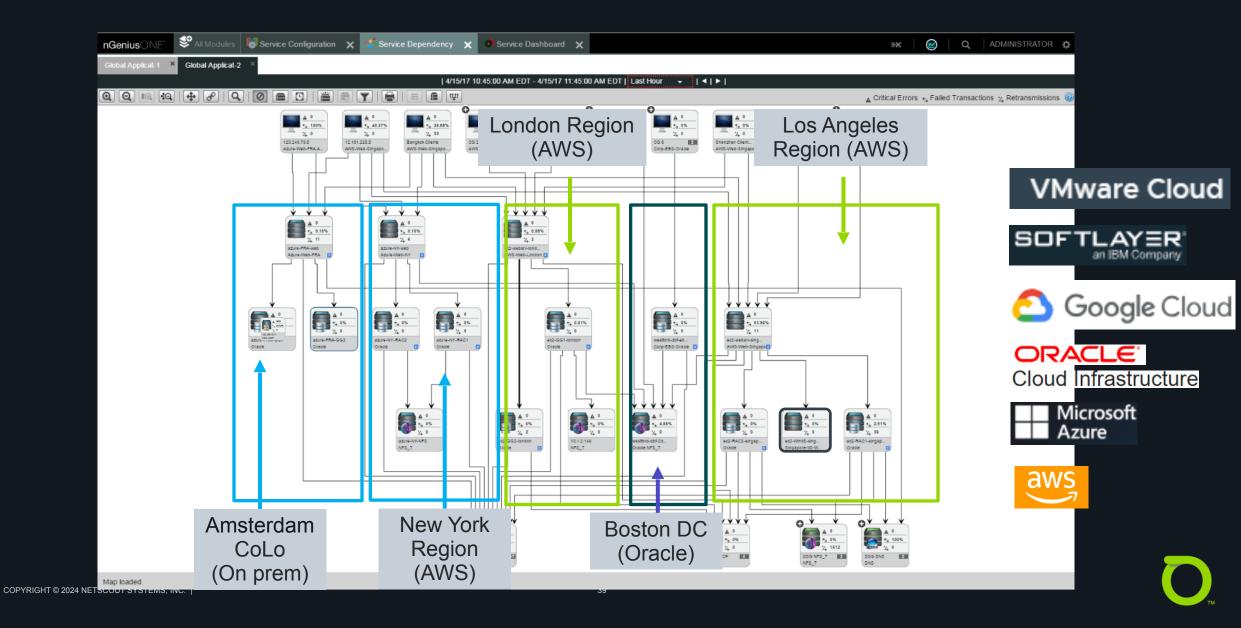




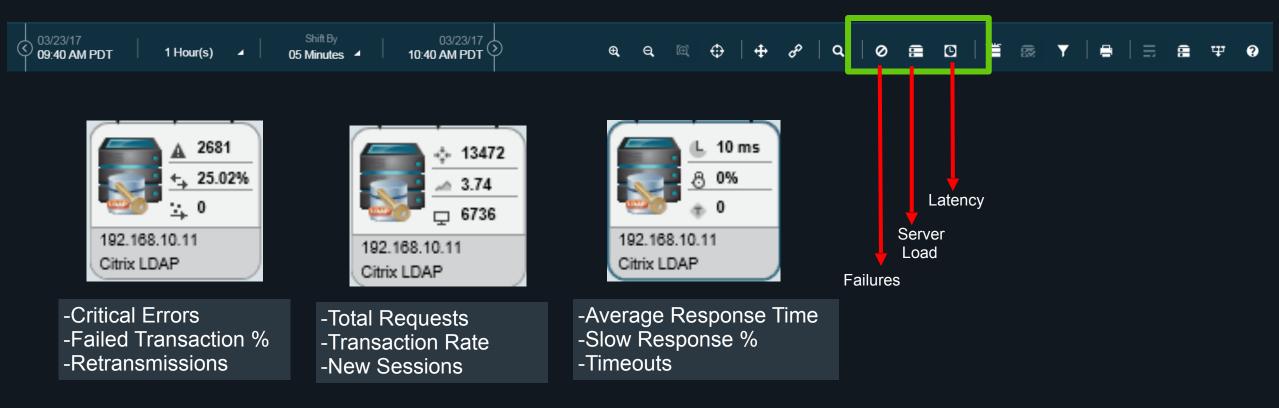






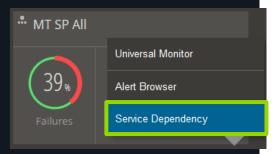


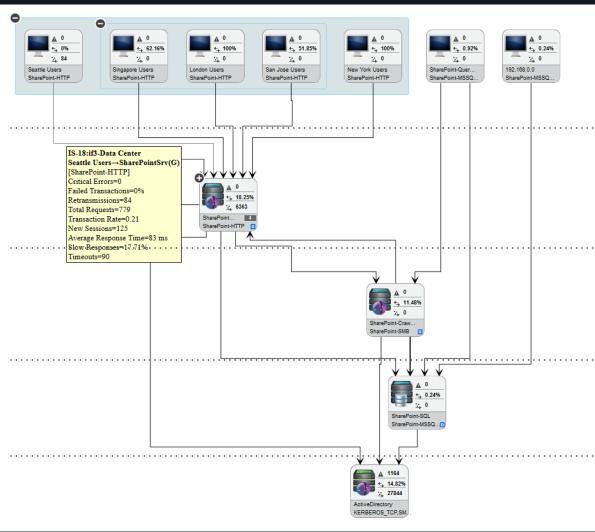
# **Dependency Map Perspectives**





# Service Dependency Mapped out





Users

Web Tier

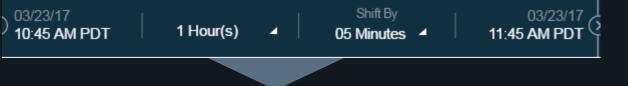
**Application Tier** 

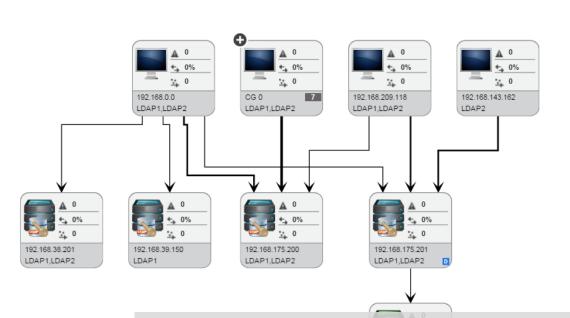
Database Tier

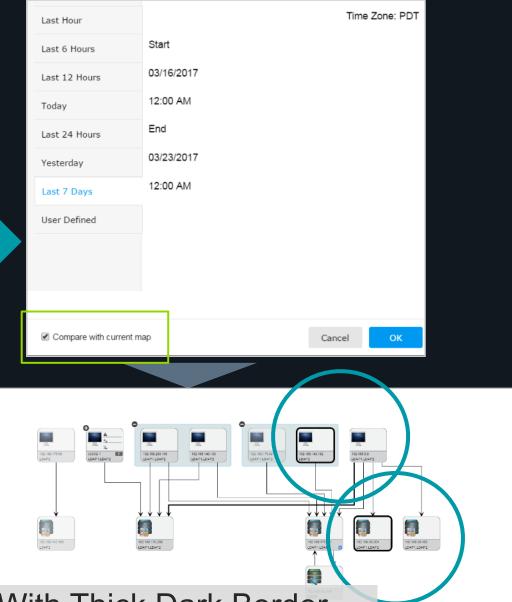
Service Enablers



## **Identify Changes**







Newly Discovered Nodes Are Shown With Thick Dark Border Nodes that are no longer available are shown as ghost icons

# **Active Monitoring**

End client simulation/Synthetic testing

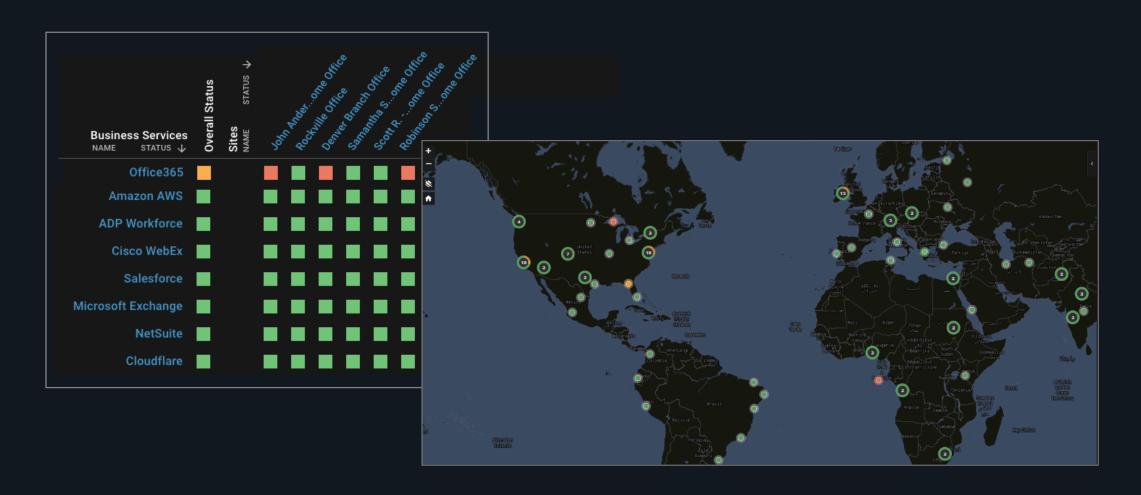


# **Enterprise-wide Service Visibility**





# **Enterprise-wide Service Visibility**



SaaS, UC&C, Business Applications, Network Services and Infrastructure Performance



## nPoint Test Catalog

#### **Business Transaction Tests**

#### SaaS

- Microsoft 365 Suite
- SFDC

#### **UCaaS**

- Microsoft Teams
- Cisco Webex
- Zoom

#### **Auth Services**

- Microsoft SSO
- SAML Okta, OneLogin, etc.
- PKI / CAC

### Applications and Services

### **Applications**

- Web URL
- VoIP
- Port Availability

#### Network Services

- DNS
- DHCP
- TFTP
- FTP
- Multicast

#### **Network Performance**

### Latency

- ICMP and TCP
- Wi-Fi latency

#### Bandwidth

- iPerf
- Fast.com
- Speedtest.net

### Quality

- Loss
- Latency
- Jitter

Custom tests can be created to perform almost any type of measurement for any application.



## **Application Experience**

## Measure reliability of access to applications and key user actions

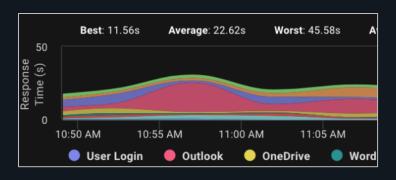
### Synthetic Tests

- Web Tests
  - Basic URL test, measures latency to the application
- Business Transaction Tests
  - Emulates key user actions within a business application
  - Customizable for any web application
  - Measure step time from Login to Logout

### Examples

- Internal and SaaS business applications
- Collaboration: Office 365, OneDrive, Google Suite
- Web sites, E-commerce, Customer-facing portals

## **Business Transaction Tests**





## **Application Experience**

## Measure reliability of access to applications and key user actions

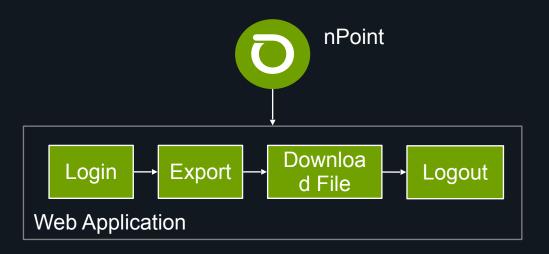
### Synthetic Tests

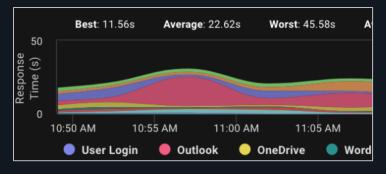
- Web Tests
  - Basic URL test, measures latency to the application
- Business Transaction Tests
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### Examples

- Internal and SaaS business applications
- Collaboration: Office 365, OneDrive, Google Suite
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## **Business Transaction Tests**

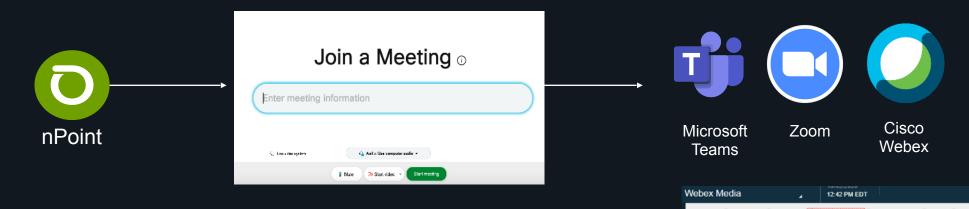






# UCaaS Web Conferencing

## Monitor Webex, Teams, and Zoom from business locations



### Features

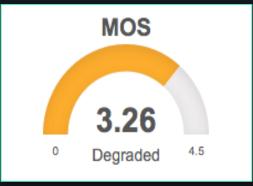
- Monitor entire meeting lifecycle
- Detect slowness and quality issues
- Analyze and troubleshoot issues with Smart Data





## **VoIP Service Monitoring**







Identify VoIP service availability and call quality issues

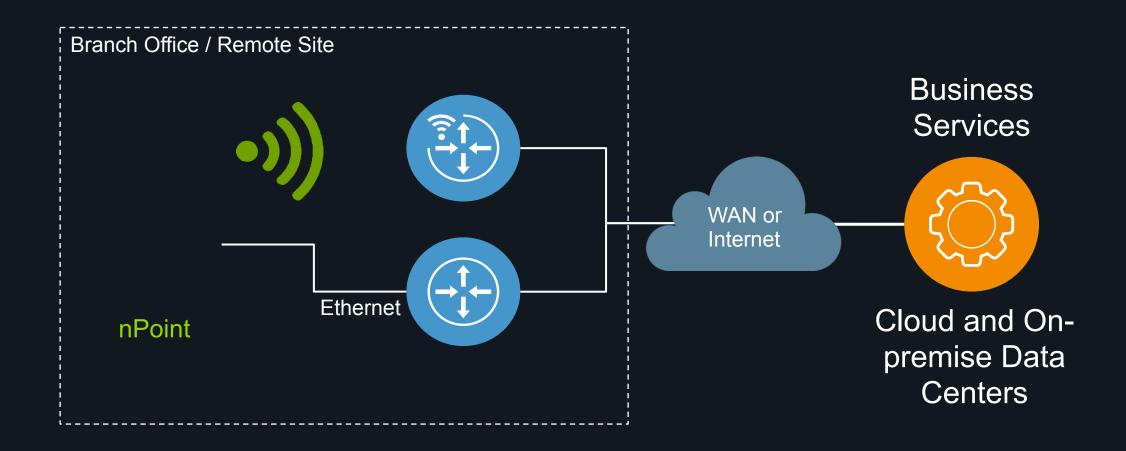
Test site-to-site and external availability into call centers

3.45	LQ MOS
1.91 %	Loss (%)
50.17 ms	Latency
1.28 ms	Jitter
50 ms	Jitter Buffer
62775 bps	Data Rate
PCMU @8kHz	Codec
822 ms	Dial Delay
3315 ms	Ring Delay

Know if your VoIP system is Working Before Employees Need It

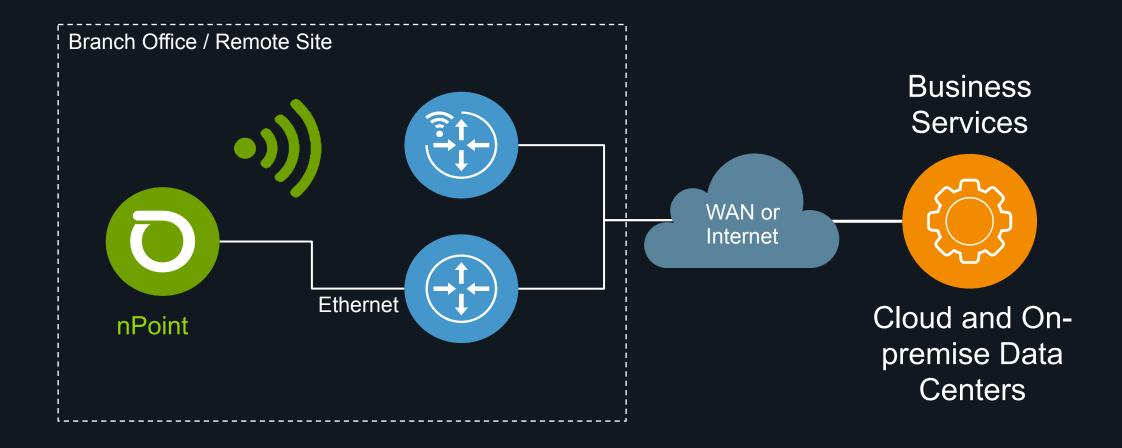


## Monitoring Experience Through the Wi-Fi Network





## Monitoring Experience Through the Wi-Fi Network

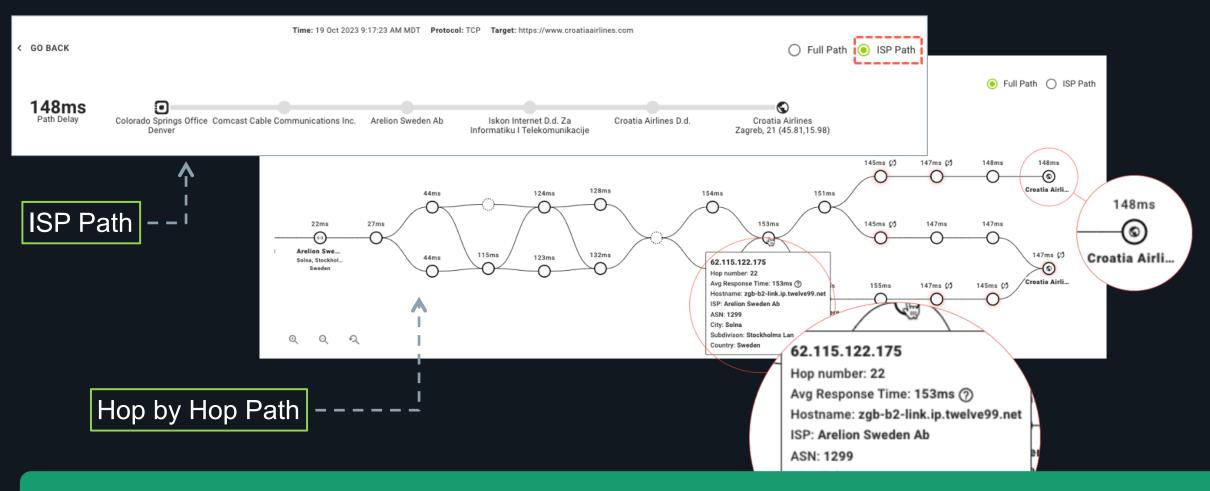




# **Network Performance Testing**



## **Path Visualization**



Determine network path routing and latency issues that may impact user experience

# Service Test Triage with nGeniusONE

nGeniusPULSE

## nGeniusONE



**Detect WHAT** is slow

Solve WHY it is slow

Combine to Detect, Solve, and Prove End-User Experience Issues



## And there is more...

## We have not talked about

- Reporting
- Executive dashboarding
- Integration with Security
- Integration to third party (RestAPI)
- The available platforms (HW, SW, Cloud, etc)

Want to know more? Hang around and talk to us

Ralph.Viergever@netscout.com

Marc.Meulensteen@netscout.com



# NETSCOUT.



# NETSCOUT.

