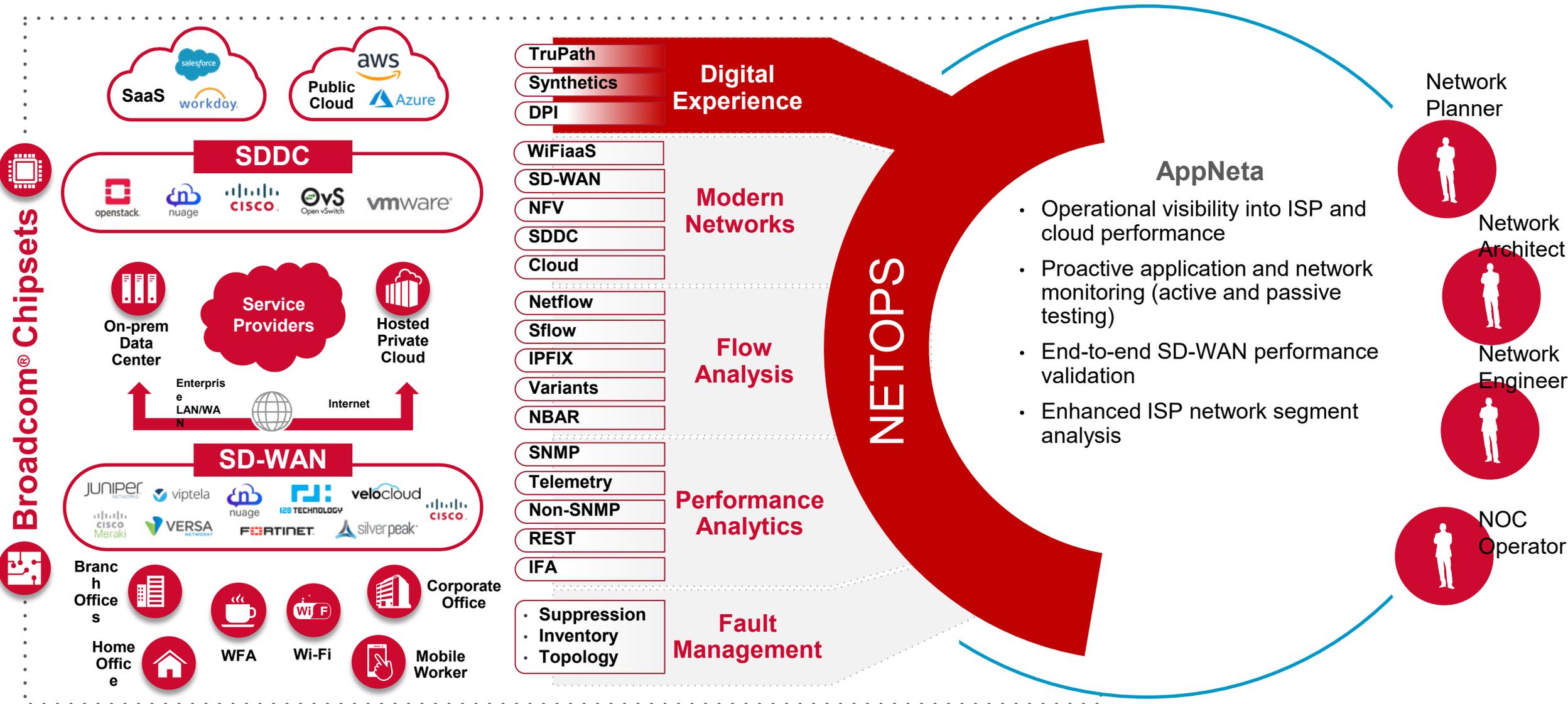


User Experience in einer automatisierten Welt

Stepan Svihla
Solution Engineering

DX NetOps for End-To-End Multi-Vendor and Multi-Cloud Coverage



Broadcom® Chipsets

NETOPS

Digital Experience

Modern Networks

Flow Analysis

Performance Analytics

Fault Management

AppNeta

- Operational visibility into ISP and cloud performance
- Proactive application and network monitoring (active and passive testing)
- End-to-end SD-WAN performance validation
- Enhanced ISP network segment analysis

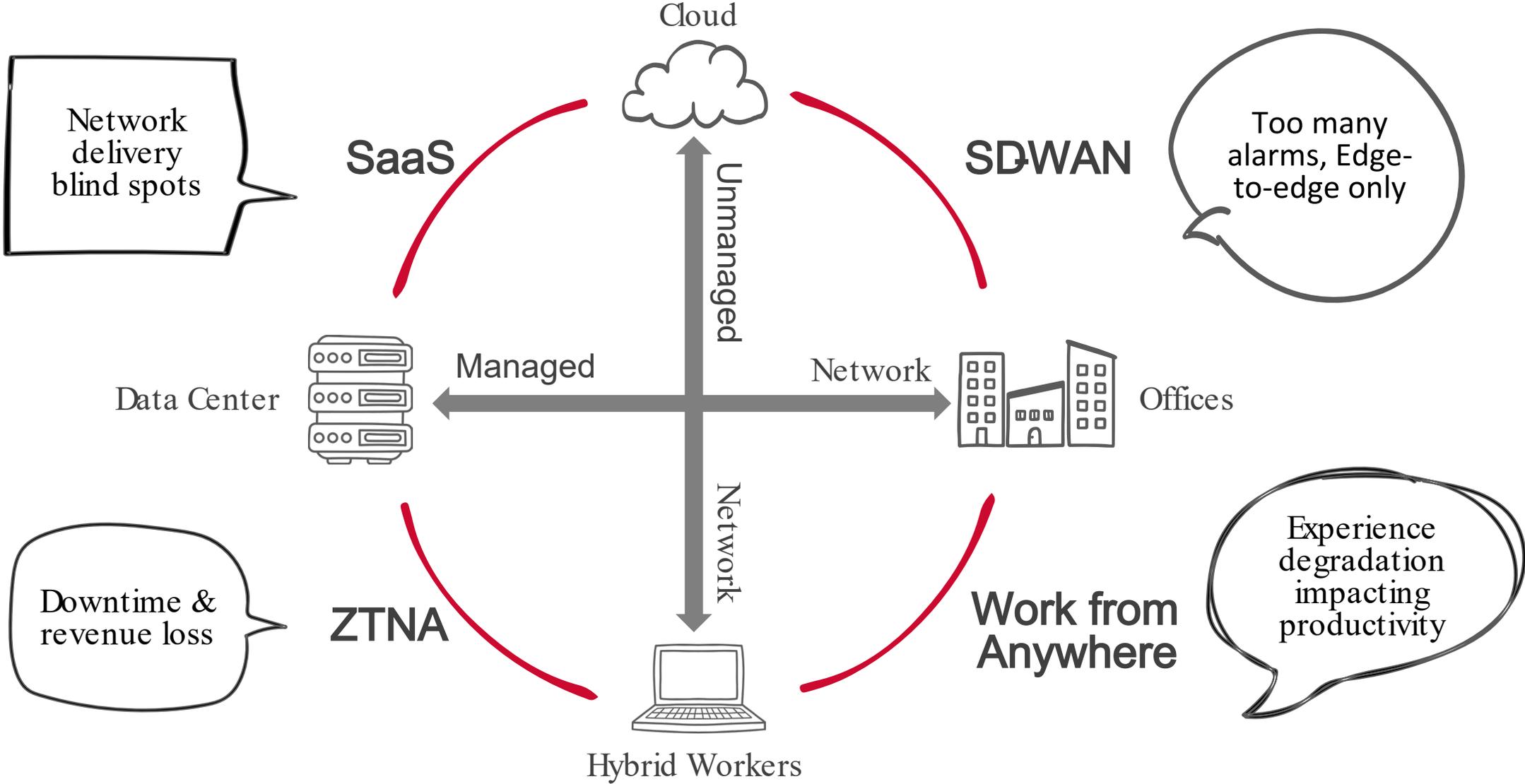
Network Planner

Network Architect

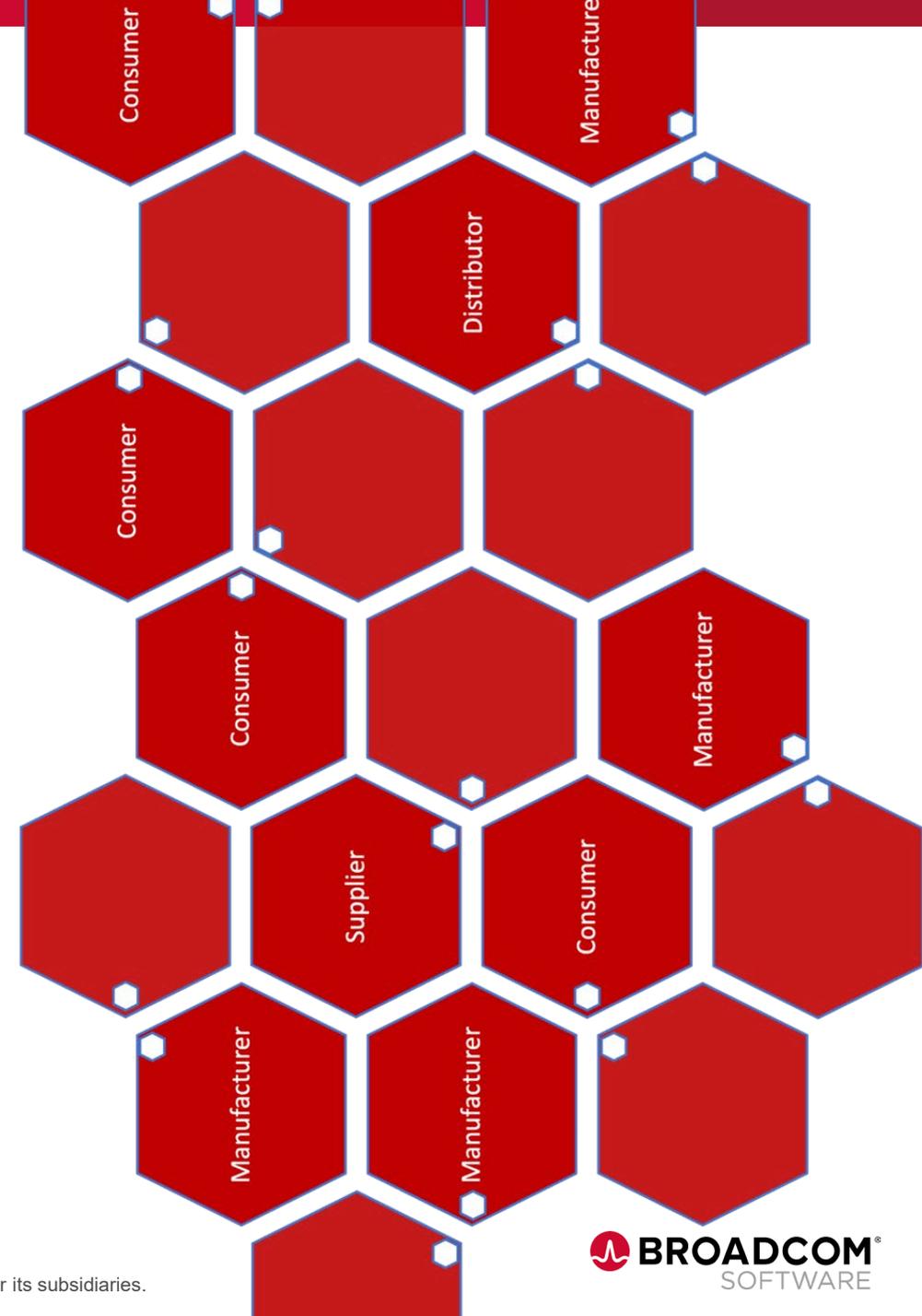
Network Engineer

NOC Operator

APPNETA: Ein "bißchen anders" als alle anderen



From VALUE chain to network



AppNeta - 4 Dimensionales Monitoring

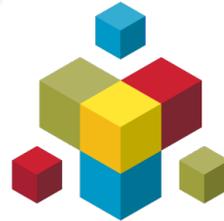
Active Monitoring Dimensions

Increase IT efficiency by dramatically reducing MTTR while isolating issues in networks outside of your control.

Network Paths
(Delivery)

Web/URL
(Experience)

Take proactive action with synthetic transaction monitoring to identify SaaS and web app issues before they affect users.



Passive Monitoring Dimensions

Monitor real end-user experience and identify every app in use across your distributed network.

Flows
(Usage)

Packets
(Usage)

Raw packet data from remote locations when and where you need it to determine the root cause of critical issues.

Ergebnisse, die eine Bedeutung haben

- Digital UX vs silo metrics



Metrics:

- Availability/Uptime
- Packetloss / Jitter / Delay

UX:

- MOS
- APDEX

1. Select
Thresholds

For any dataset, understand the measurement well enough to select appropriate T and F boundary thresholds

2. Group
results into bins

Value scale based on e.g. time, quality, accuracy

3. Count
samples in each bin

Satisfied Tolerating. Frustrated

4. Calculate
Apdex formula

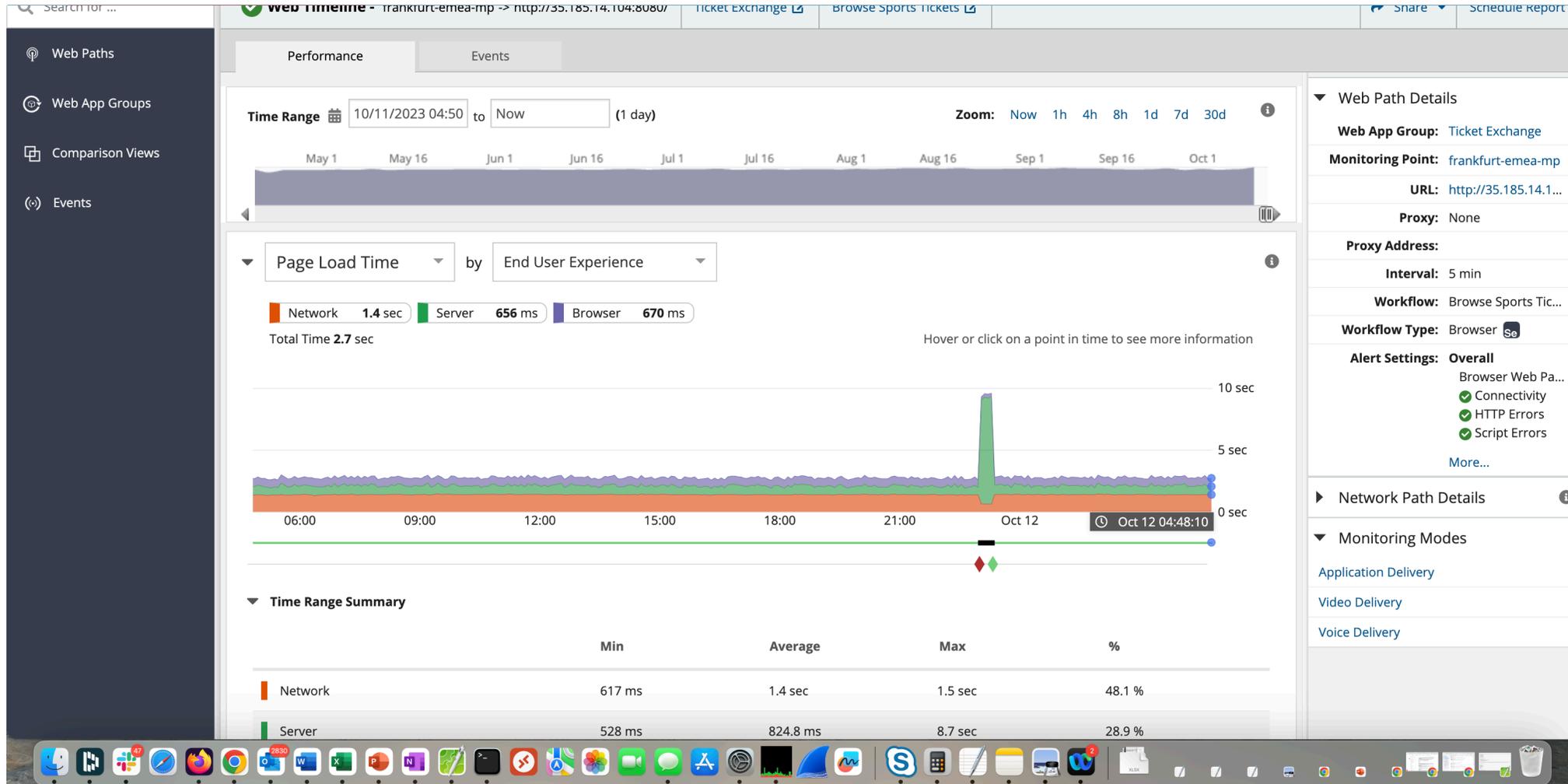
Apdex Score:
$$\frac{((\text{Satisfied}) + (\text{Tolerating}/2) + (\text{Frustrated} * 0))}{(\text{Satisfied} + \text{Tolerating} + \text{Frustrated})}$$

Vielfältige Anwendungsfälle

- **Ist es das Netz oder die Applikation**
- Cloud Adoption
- SaaS Adoption
- **Netzwerk Qualität**
- Intelligente Netze(OT & IOT)

Use Case 1

Applikation oder Netz



Use Case 1

Applikation oder Netz

The screenshot displays the AppNeta web performance monitoring interface. The main view is the 'Web Timeline' for the 'Ticket Exchange' application, showing performance data for the time range 10/11/2023 22:38 to 23:50 (1 hour). The graph shows 'Page Load Time' by 'End User Experience' with components for Network (1.4 sec), Server (777 ms), and Browser (668 ms), resulting in a Total Time of 2.8 sec. A summary table below the graph provides detailed metrics for Network and Server components.

	Min	Average	Max	%
Network	617 ms	1.2 sec	1.4 sec	25 %
Server	596 ms	2.9 sec	8.7 sec	63.2 %

On the right side, the 'Web Path Details' panel shows configuration for the 'Ticket Exchange' monitoring point, including the URL, proxy settings, interval (5 min), and workflow type (Browser). The 'Alert Settings' section indicates that connectivity, HTTP errors, and script errors are monitored.

Use Case 1

Applikation oder Netz

The screenshot shows the AppNeta Web Drill-down interface for a test run on 'frankfurt-emea-mp' at 'http://35.185.14.104:8080/'. The test failed at Milestone 4 with the error: 'Test Failed: [Milestone 4] clickAndWait: no such element: Unable to locate element: ("method":"xpath","selector":"/html/body/table[3]/tbody/tr[3]/td/b/a/font")'. The interface includes a navigation sidebar, a search bar, and a main content area with a 'Snapshots' section showing a browser error message and a 'Timeline' section with a bar chart and a table of milestones.

Test Failed: [Milestone 4] clickAndWait: no such element: Unable to locate element: ("method":"xpath","selector":"/html/body/table[3]/tbody/tr[3]/td/b/a/font")

Snapshots

Offset time: 10.653s

Timeline

#	Milestone Name	Start	Duration	Hourly Avg	Page Load	Target	Alert Status	Apdex
1	Milestone 1: Sign-In	0 ms	772 ms	753 ms	654 ms	Sign-in Form	Ok	100%
2	Milestone 2: Browse Sports Category	772 ms	5.2 s	1.7 s	4.4 s	Error Page	Ok	98%
3	Milestone 3: Select Product ID	6.0 s	4.5 s	542 ms	4.2 s	Error Page	Ok	98%
4	Milestone 4: Select Item ID	10.4 s	51 ms	710 ms	-	Error Page	Ok	-
5	Milestone 5: Sign-Out	10.5 s	0 ms	488 ms	-	Error Page	No alert profile	96%

Use Case 1

Applikation oder Netz

The screenshot shows the AppNeta interface with a 'Web Drill-down' for the URL 'http://35.185.14.104:8080/'. The browser window displays an error page for 'TIXCHANGE' with the following content:

Error

com.jtixchange.struts.BeanActionException

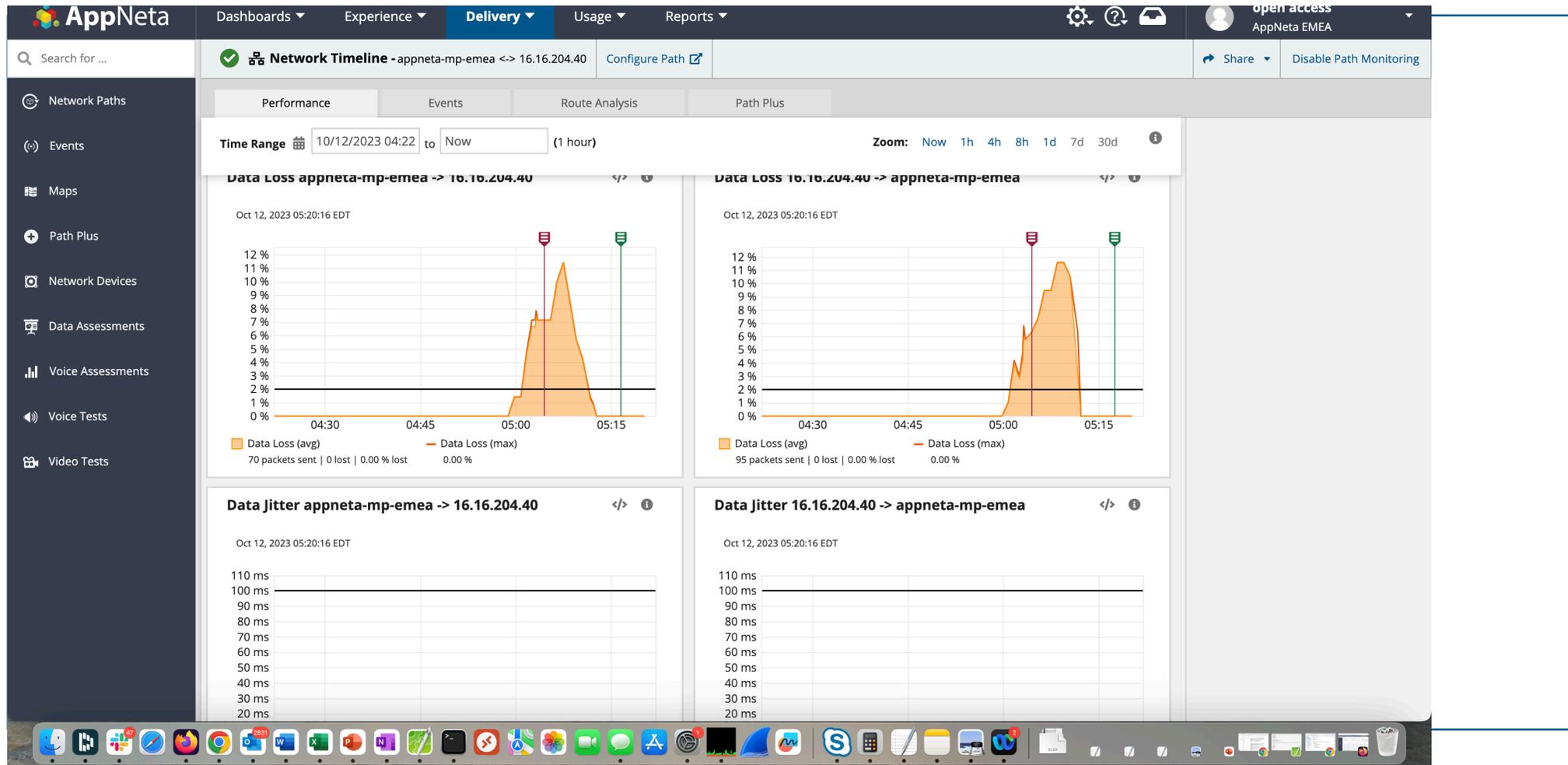
Error dispatching bean action. Cause: com.ibatis.dao.client.DaoException: Error starting SQL Map transaction. Cause: com.mysql.jdbc.exceptions.jdbc4.MySQLNonTransientConnectionException: Could not create connection to database server. Attempted reconnect 3 times. Giving up. Caused by: com.mysql.jdbc.exceptions.jdbc4.MySQLNonTransientConnectionException: Could not create connection to database server. Attempted reconnect 3 times. Giving up.

Stack

```
com.jtixchange.struts.BeanActionException: Error dispatching bean action. Cause: com.ibatis.dao.client.DaoException: Error starting SQL Map transaction. Cause:
Caused by: com.mysql.jdbc.exceptions.jdbc4.MySQLNonTransientConnectionException: Could not create connection to database server. Attempted reconnect 3 times. Gi
    at com.jtixchange.struts.ViewCategoryActionHandler.execute(ViewCategoryActionHandler.java:140)
    at org.apache.struts.action.RequestProcessor.processActionPerform(RequestProcessor.java:484)
    at org.apache.struts.action.RequestProcessor.process(RequestProcessor.java:274)
    at org.apache.struts.action.ActionServlet.process(ActionServlet.java:1482)
    at org.apache.struts.action.ActionServlet.doGet(ActionServlet.java:507)
    at javax.servlet.http.HttpServlet.service(HttpServlet.java:529)
    at javax.servlet.http.HttpServlet.service(HttpServlet.java:623)
    at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:209)
    at org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:153)
    at org.apache.tomcat.websocket.server.WsFilter.doFilter(WsFilter.java:51)
    at org.apache.catalina.core.ApplicationFilterChain.internalDoFilter(ApplicationFilterChain.java:178)
    at org.apache.catalina.core.ApplicationFilterChain.doFilter(ApplicationFilterChain.java:153)
    at org.apache.catalina.core.StandardWrapperValve.invoke(StandardWrapperValve.java:167)
    at org.apache.catalina.core.StandardContextValve.invoke(StandardContextValve.java:90)
    at org.apache.catalina.authenticator.AuthenticatorBase.invoke(AuthenticatorBase.java:481)
    at org.apache.catalina.core.StandardHostValve.invoke(StandardHostValve.java:130)
    at org.apache.catalina.valves.ErrorReportValve.invoke(ErrorReportValve.java:93)
```

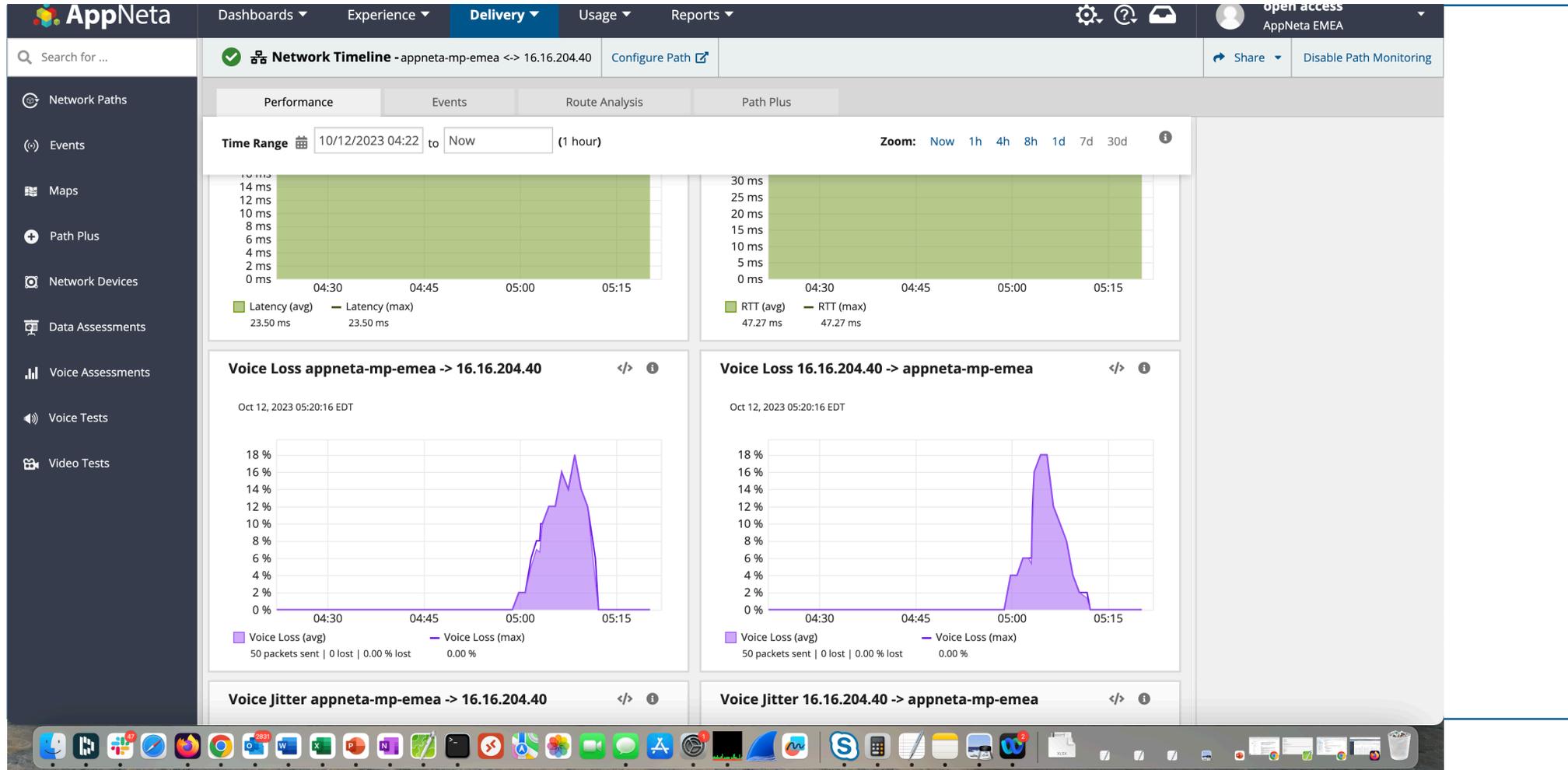
Use Case 2

Ende zu Ende Messungen



Use Case 2

Ende zu Ende Messungen



Use Case 2

Ende zu Ende Messungen

The screenshot displays the AppNeta Network Timeline dashboard. The top navigation bar includes 'Dashboards', 'Experience', 'Delivery', 'Usage', and 'Reports'. The user is logged in as 'open access AppNeta EMEA'. The main content area is titled 'Network Timeline - appneta-mp-emea <-> 16.16.204.40'. It features a sidebar with navigation options like 'Network Paths', 'Events', 'Maps', 'Path Plus', 'Network Devices', 'Data Assessments', 'Voice Assessments', 'Voice Tests', and 'Video Tests'. The main view is divided into four panels: 'Performance' (Voice Jitter avg and max), 'Events', 'Route Analysis', and 'Path Plus'. The Performance panels show line graphs of Voice Jitter (avg) and Voice Jitter (max) over time (04:30 to 05:15). The MOS panels show line graphs of MOS (avg) and MOS (min) over time (04:30 to 05:15). The bottom status bar shows 'User ID: open.access+demo@broadcom.com', 'Page ID: Network Timeline', 'Version: 16.20.0.31242', and the Broadcom Software logo.

Use Case 2

Ende zu Ende Messungen

The screenshot displays the AppNeta Network Timeline interface. The main view shows a timeline from 04:25 to 05:00. A tooltip is visible over the timeline at 05:04:32, indicating two events: "Measured Data Loss (7.1400%) violates condition EDT Data Loss > 2 %" and "Measured Data Loss (6.3200%) violates condition EDT Data Loss > 2 %". The interface includes a sidebar with navigation options like Network Paths, Events, Maps, Path Plus, Network Devices, Data Assessments, Voice Assessments, Voice Tests, and Video Tests. The top navigation bar shows "Delivery" as the active tab. The right sidebar contains configuration details for the path, including Target Type, VoIP Codec, Instrumentation, Port Settings, QoS Settings, Group, Importance, Diagnostic, ISP, and Alert Settings. A "Monitoring Modes" section is also visible, showing Video Delivery, Voice Delivery, and Experience. The bottom of the screen shows a Windows taskbar with various application icons.

Use Case 2

Ende zu Ende Messungen

The screenshot displays the AppNeta web interface for monitoring a network path between Madrid and Stockholm. The path is labeled "appneta-mp-emea (GCP) <-> (AWS) 16.16.204.40 (dual)". The test status is "Failed" at 10/12/2023 05:07. The path diagram shows 14 hops, with hops 3, 5, 11, 12, 13, and 14 marked with question marks, indicating diagnostic failures. The outbound direction (Madrid to Stockholm) shows 20.85% data loss and 23.48 ms latency. The inbound direction (Stockholm to Madrid) shows 0% data loss and 0 ms latency. The interface includes a sidebar with navigation options like Network Paths, Events, Maps, Path Plus, Network Devices, Data Assessments, Voice Assessments, Voice Tests, and Video Tests. The main content area has tabs for Summary, Data Details, Voice Details, and Related Network Devices. The right sidebar shows an Overview section with details like Target Type (Auto), Monitoring Point (appneta-mp-emea), Target (16.16.204.40), Last Diagnostic (10/12/2023 05:07), Test Status (Failed), Test ID (3163701), Test Name (Monitor suspects data...), Start Time (10/12/2023 05:04), and VoIP Codec (G.711). Below the Overview is a Test History table with 10 entries.

Test ID	Test Name	Test Status	Start Time	VoIP Codec
3163701	Monitor suspects data...	Failed	10/12/2023 05:04	G.711

Test History
1. 10/12/2023 05:04 EDT
2. 10/12/2023 04:03 EDT
3. 10/12/2023 03:03 EDT
4. 10/12/2023 02:02 EDT
5. 10/12/2023 01:02 EDT
6. 10/12/2023 00:03 EDT
7. 10/11/2023 23:04 EDT
8. 10/11/2023 22:03 EDT
9. 10/11/2023 21:02 EDT
10. 10/11/2023 20:02 EDT

Use Case 2

Ende zu Ende Messungen

The screenshot displays the AppNeta interface for a test titled "appneta-mp-emea (GCP) <-> (AWS) 16.16.204.40 (dual)". The test path is "Madrid to Stockholm (appneta-mp-emea -> aws-demo-appneta)". The test status is "Failed".

Hop	Severity	IP Address	Host Name	Voice Loss (%)	MOS	Latency (ms)	Voice Jitter (ms)			RTT (ms)			QoS	
							Avg	Max	Min	Avg	Max	Set	Measured	
1	✖	172.19.0.1	172.19.0.1	11.00	3.4	0.00	0.02	0.07	0.01	0.01	0.05	-	-	
2	⊖	108.170.253.252	108.170.253.252	-	-	-	-	-	-	-	-	-	-	
4	⊖	52.93.93.33	52.93.93.33	-	-	-	-	-	-	-	-	-	-	
6	⊖	52.93.144.124	52.93.144.124	-	-	-	-	-	-	-	-	-	-	
7	⊖	52.93.145.33	52.93.145.33	-	-	-	-	-	-	-	-	-	-	
8	⊖	52.93.145.234	52.93.145.234	-	-	-	-	-	-	-	-	-	-	
9	⊖	52.93.145.11	52.93.145.11	-	-	-	-	-	-	-	-	-	-	
10	⊖	52.93.142.114	52.93.142.114	-	-	-	-	-	-	-	-	-	-	
15	✖	16.16.204.40	aws-demo-app...	19.40	2.6	23.48	0.10	1.24	47.13	47.31	49.30	-	-	

The right sidebar shows test details: Target Type: Auto, Monitoring Point: appneta-mp-emea, Target: 16.16.204.40, Last Diagnostic: 10/12/2023 05:07. The Test Status section shows Test ID: 3163701, Test Name: Monitor suspects data..., Test Status: Failed, Start Time: 10/12/2023 05:04, and VoIP Codec: G.711. The Test History section lists 10 previous test runs with timestamps.

Use Case 2

Ende zu Ende Messungen

The screenshot displays the AppNeta interface for a test titled "appneta-mp-emea (GCP) <-> (AWS) 16.16.204.40 (dual)". The "Data Details" tab is active, showing a path from Madrid to Stockholm. The test status is "Failed".

Madrid to Stockholm (appneta-mp-emea -> aws-demo-appneta)

Hop	Severity	IP Address	Host Name	Data Loss (%)	Measured MTU (bytes)	Latency (ms)	Data Jitter (ms)			RTT (ms)			QoS	
							Avg	Max	Min	Avg	Max	Set	Measured	
1	✖	172.19.0.1	172.19.0.1	11.45	1500	0.00	0.01	0.05	0.01	0.01	0.05	-	-	
2	⊖	108.170.253.252	108.170.253.252	-	-	-	-	-	-	-	-	-	-	
4	⊖	52.93.93.33	52.93.93.33	-	-	-	-	-	-	-	-	-	-	
6	⊖	52.93.144.124	52.93.144.124	-	-	-	-	-	-	-	-	-	-	
7	⊖	52.93.145.33	52.93.145.33	-	-	-	-	-	-	-	-	-	-	
8	⊖	52.93.145.234	52.93.145.234	-	-	-	-	-	-	-	-	-	-	
9	⊖	52.93.145.11	52.93.145.11	-	-	-	-	-	-	-	-	-	-	
10	⊖	52.93.142.114	52.93.142.114	-	-	-	-	-	-	-	-	-	-	
15	✖	16.16.204.40	aws-demo-app...	20.85	1460	23.48	0.08	1.08	47.13	47.31	49.30	-	-	

Stockholm to Madrid (aws-demo-appneta -> 34.175.108.248)

Overview

- Target Type: Auto
- Monitoring Poi...: appneta-mp-emea
- Target: 16.16.204.40
- Last Diagnostic: 10/12/2023 05:07

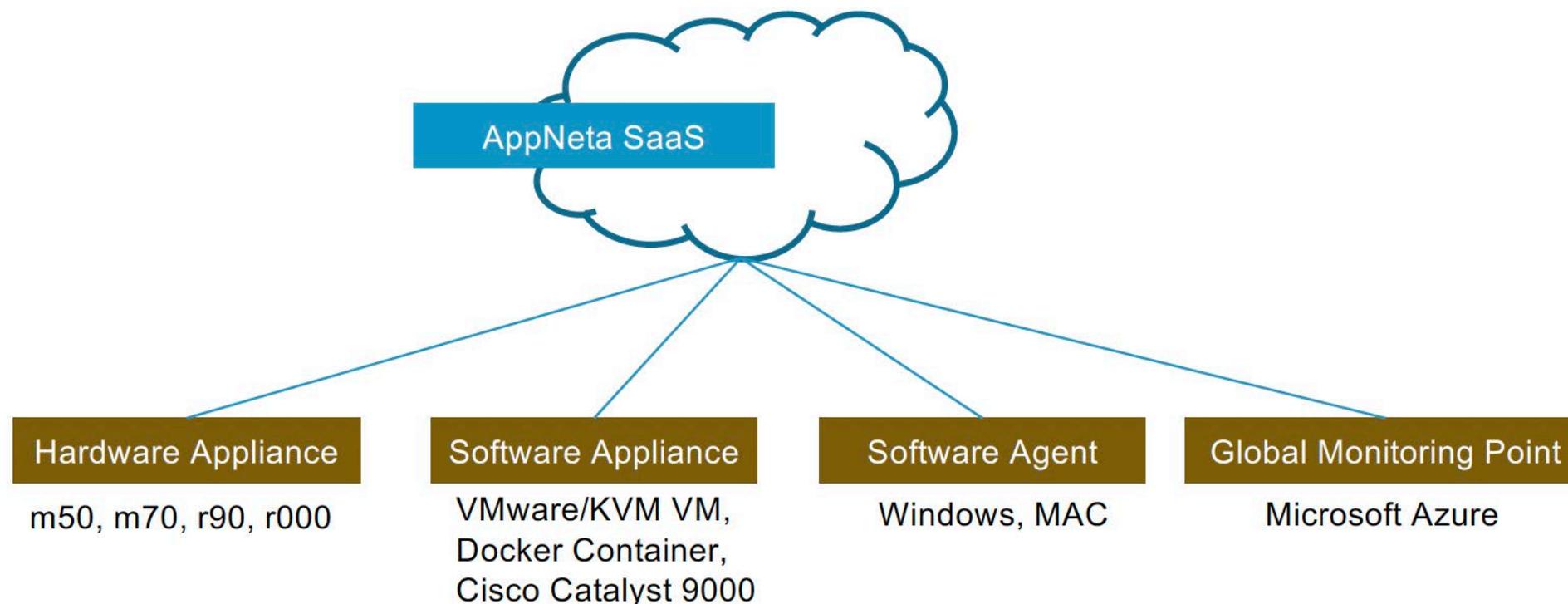
Test Status

- Test ID: 3163701
- Test Name: Monitor suspects data...
- Test Status: Failed
- Start Time: 10/12/2023 05:04
- VoIP Codec: G.711

Test History

- 10/12/2023 05:04 EDT
- 10/12/2023 04:03 EDT
- 10/12/2023 03:03 EDT
- 10/12/2023 02:02 EDT
- 10/12/2023 01:02 EDT
- 10/12/2023 00:03 EDT
- 10/11/2023 23:04 EDT
- 10/11/2023 22:03 EDT
- 10/11/2023 21:02 EDT
- 10/11/2023 20:02 EDT

AppNeta Monitoring Point Options



SKU	Description	Notes
APPNTA990	AppNeta Universal License Unit (1Gbps, 15Apps, 1GMP, 50Agents)	
APNSOI990	AppNeta Small Office Appliance (International, 4 Wi-Fi Networks)	m70, 13% Hardware Support Required
APNSOA990	AppNeta Small Office Appliance	m50, 13% Hardware Support Required
APNSDC990	AppNeta Small Data Center Appliance (Requires 6 Universal Licenses)	r90, 13% Hardware Support Required
APNLDC990	AppNeta Large Data Center Appliance (Requires 12 Universal Licenses)	M70, 13% Hardware Support Required

Thank you

And now back to what the internet was made for...

