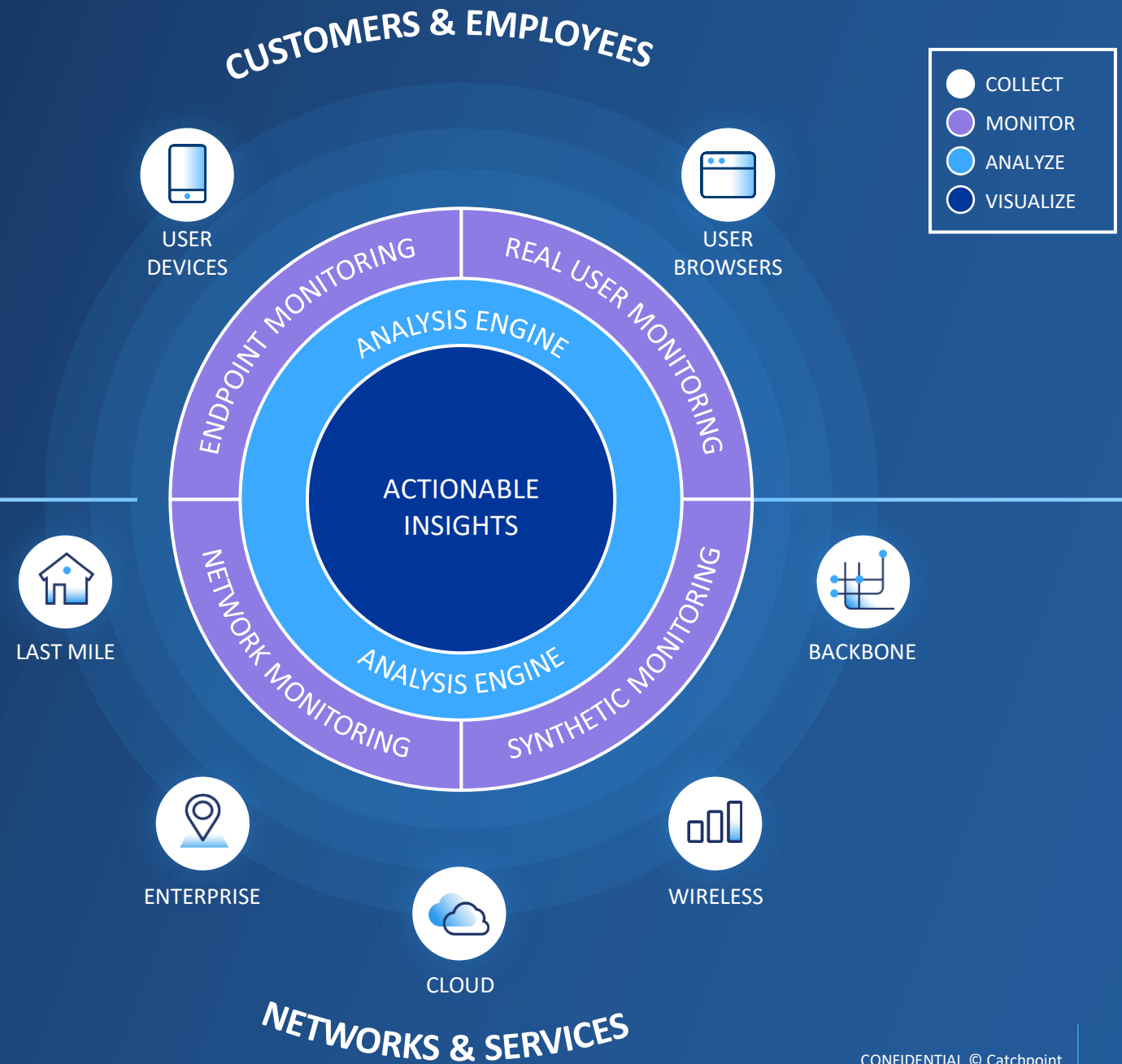




Catchpoint Monitoring Guide

Complete Platform

- AI-powered
- Big-data scale
- As-a-service
- Flexible pricing



Catchpoint global monitoring network:

1, 963 vantage points



**BACKBONE
NODES**
582 Locations
225 Providers

**LAST MILE
NODES**
104 Locations
62 Providers

**WIRELESS
NODES**
31 Locations
13 Providers

**CLOUD
NODES**
147 Locations
8 Providers

BGP Peers
1099 Peer Locations
386 ASNs Providers

864 Synthetic
Locations

1099 BGP
Peers

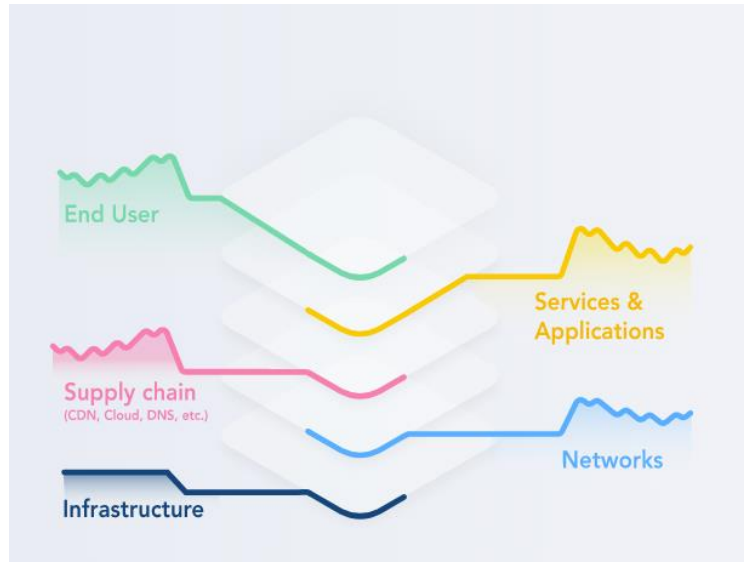
86
Countries

248
Cities

287
Providers

386
BGP ASNs

Catchpoint Node global monitoring capabilities

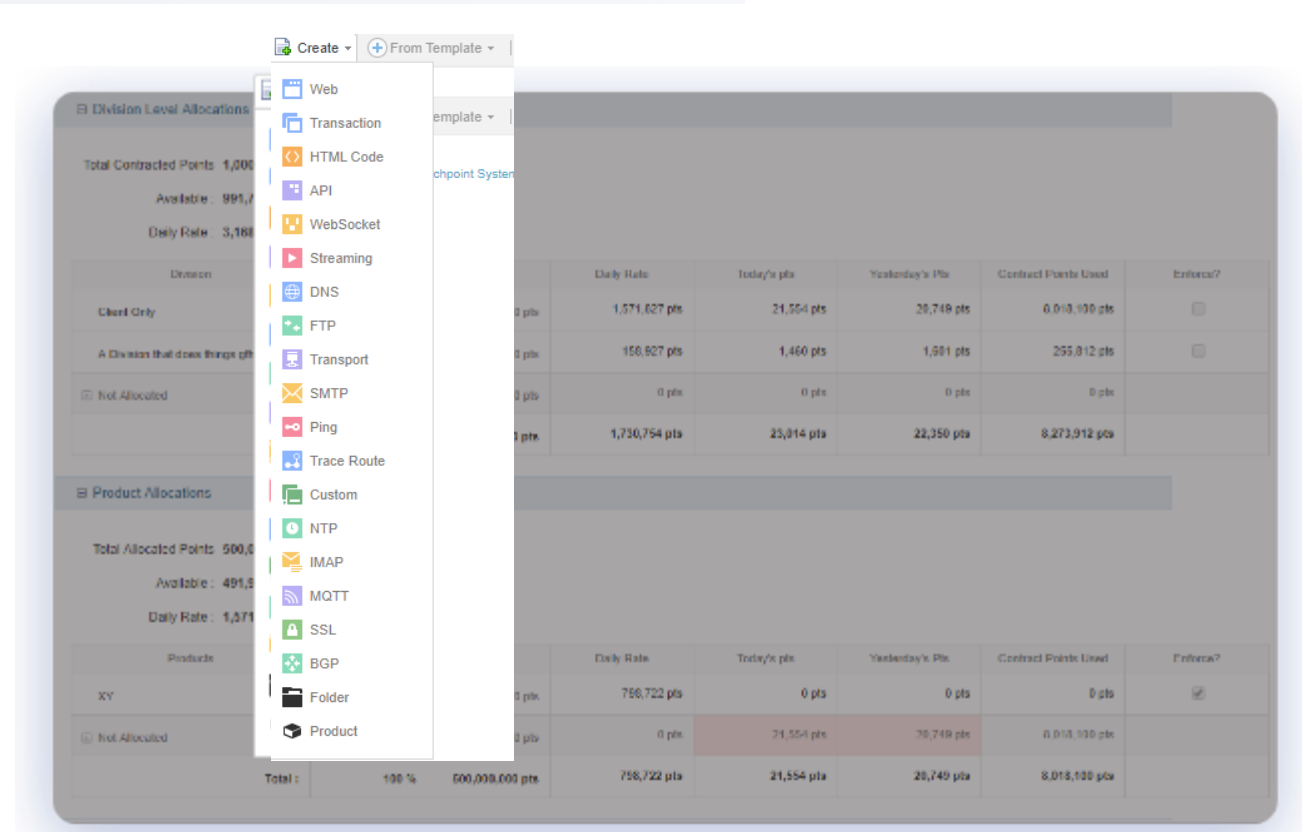


Understand how infrastructure and page elements impact your end users

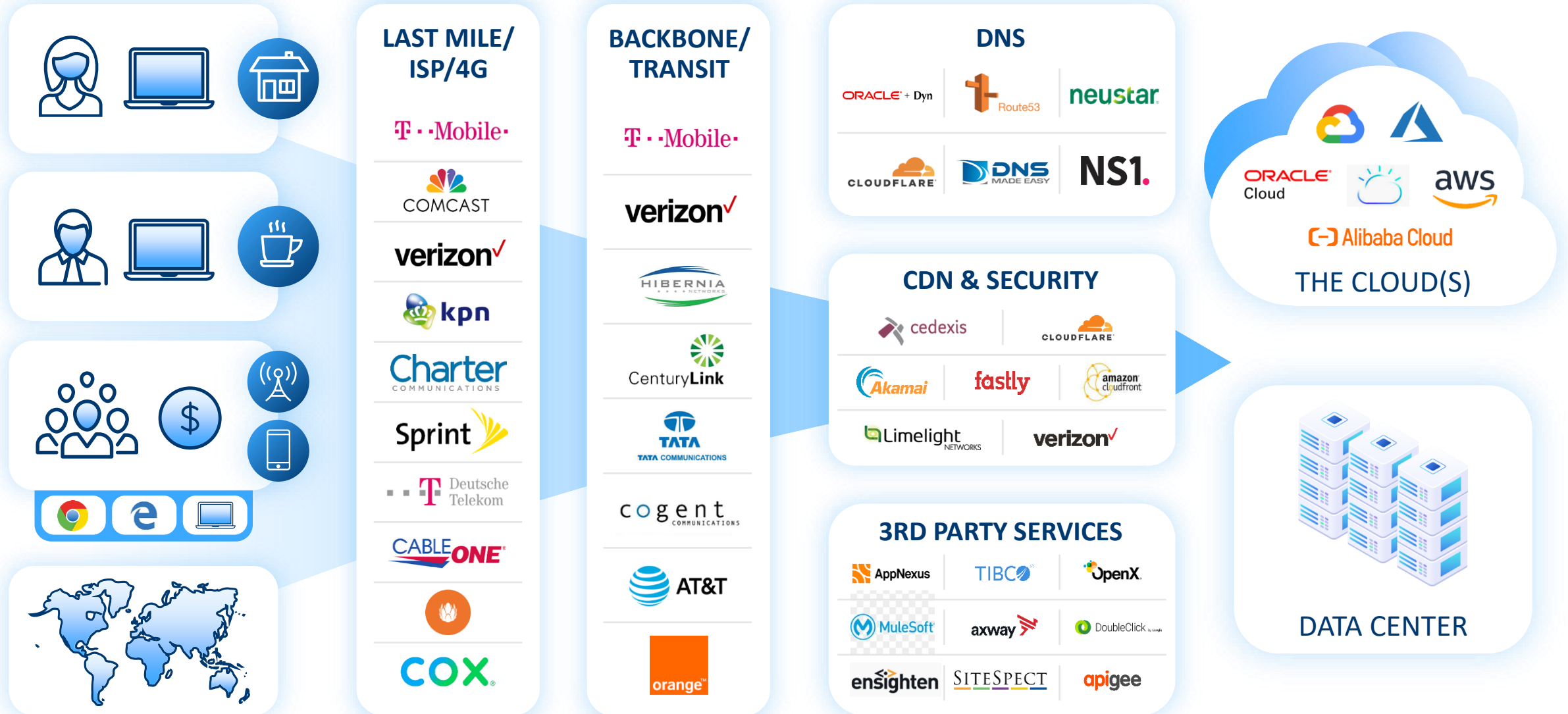
Monitor and troubleshoot all of the delivery chain with visibility into DNS, CDNs, local ISPs, APIs, third-party providers, and more.

20+ monitor types including API, DNS, SSL, Trace Route, and Web

Know how every component of your service delivery chain impacts users and receive specific alerts if something goes wrong.



Application delivery chain in reality



Measure Everything from End User Perspective

Front End

- Critical HTTP Endpoints
- Critical User Journeys
- RUM for all pages

Microservices

- Synthetic API

DNS

- Managed DNS providers
- CDN DNS

CDN

- Origin v/s CDN
- Zones to measure CDN only vs full page performance
- CDN DNS
- CDN Mapping
- Cache HIT vs Cache Miss
- End User to CDN Edge Latency
- Edge to Middle Mile Latency
- Edge to Origin Latency
- Edge to Origin DC Mapping
- CDN UAT monitoring

Cloud

- Availability
- Perf/ Latency
- Reliability
- CDN to Cloud

Network

- Peering
- BGP
- Latency
- Congestion

3rd party

- APIs
- Latency
- Impact on primary content
- SLA
- Infra health of 3rd party

End User Experience Maturity Model

Reachability

- 1.Test : Object test + traceroute(Every critical host)
- 2.Test : Traceroute (IP endpoint)
- 3.Test : Ping (IP/Host)
- 4.Alerts : Path Alerts
- 5.Alerts : AS Alerts
- 6.Alerts : Ping Alerts
- 7.Alerts : IP alerts
- 8.Smartboard for triage
- 9.Tile Dashboard for overview
- 10.Nodes : Backbone nodes
- 11.RUM : Network Error Logging(NEL)

Availability

- 1.Test : Object tests
- 2.Test : Web Tests
3. Test : API
- 4.Test : Transaction
- 5.Test : SMTP
- 6.Test : FTP
- 7.Test : DNS
- 8.Config : Test Assertions
- 9.Test : Protocol – SSL, TCP, UDP,
10. Features : Zones
- 11.Features : Debug
- 12.Features : Screenshot
13. Features : Response Capture
14. Alerts : Test Failure Alerts
- 15.Alerts : Content Match Alerts
- 16.Alerts : Zone Alerts
17. Alerts : Availability Alerts
- 18.Overview Dashboard
- 19.Custom Dashboards
- 20.Smartboard for triage
- 21.SLA Reports
22. Error Reporting
- 23.Daily/Weekly/Monthly Reports
- 24.Nodes : Cloud/Backbone/Enterprise nodes
- 25.RUM : NEL
- 26.RUM : Outage Analyzer
- 27.RUM : Alerts : % Bounce
- 28.RUM : Smartboard

Performance

- 1.Nodes : Backbone/Last Mile/Mobile/Enterprise Nodes
- 2.Features : Filmstrips
- 3.Features : Screenshots
- 4.Features : Insights
- 5.Features : Zones
- 6.Features : Hosts
7. Request Charts
- 8.Features : Bandwidth throttling
- 9.CDN Monitoring strategy
10. Alerts : Byte Length Alerts
- 11.Alerts : Timing Alerts
- 12.Alerts : Zone timing alerts
- 13.Alerts : Insights alerts
- 14.Alerts : Test Failure Alerts
- 15.CDN Mapping Dashboard
- 16.Alerts : CDN strategy alerts
17. Alerts : DNS level alerts
- 18.Custom Dashboard
- 19.Performance Reports
- 20.Smartboard for triage
- 21.Analysis: Line Graphs
- 22.Analysis: Scatter plot
- 23.Analysis: Zones chart
- 24.Analysis: Host Chart
- 25.Analysis: Request Chart
- 26.Analysis: Breakdown by Insights
27. RUM : ALL Pre-aggregated Charts
- 28.RUM : Smartboard
- 29.RUM : Explorer
- 30.RUM : Dataviews

Reliability

- 1.Analysis: Hour of Day/Day of week
- 2.Analysis: By City/ISP chart
- 3.Analysis: CDF
- 4.Analysis: Histogram
- 5.Analysis: Statistical
- 6.Analysis: CDN Mapping
- 7.RUM : Histogram
- 8.RUM : Engagement



Catchpoint Capabilities

Web Test - Object

The Catchpoint Web test offers crucial insight to the performance of your webpage. The test examines a single URL, you can customize how that resource is investigated by choosing the type of monitor, including additional elements to the HTTP request header, and defining advanced settings such as Traceroute. Additionally, you can override the default values set up at the Product and Folder level for targeting, scheduling, authentication, HTTP requests, Insight collection and alerts.

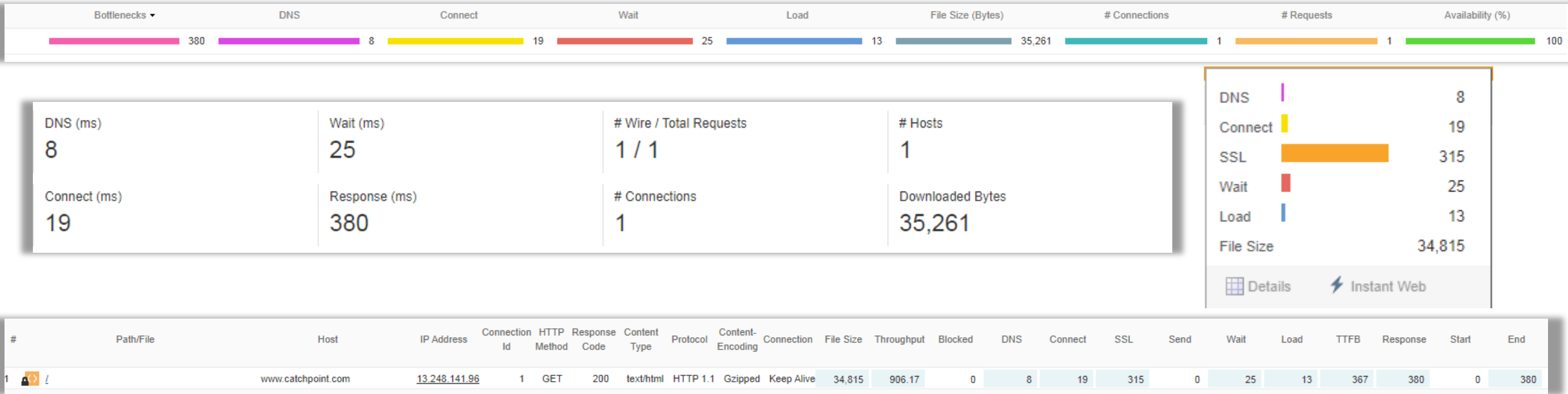
- Object Test -
 - Monitor a single URL, be it a simple base html file, image, JavaScript file, binary file, anything http based. Get or Post.

Use Cases

- High frequency, Availability monitoring. Know if the server is up or down.
- CDN governance. Ensuring the correct CDN server is being used in each region and is performant.

Metrics and Benefits

- DNS, Connect, SSL, Send, Wait, Time to First Byte, Load, Response, Redirect time, Server Response, File Size, Downloaded Bytes, Throughput, Wire Time, Availability.
- Multiple metrics to help determine if a network or server issue, as well as extra insights from the Headers and Response to reduce MTDD.



Web Test - Emulated

The Catchpoint Web test offers crucial insight to the performance of your webpage. The test examines a single URL, you can customize how that resource is investigated by choosing the type of monitor, including additional elements to the HTTP request header, and defining advanced settings such as Traceroute. Additionally, you can override the default values set up at the Product and Folder level for targeting, scheduling, authentication, HTTP requests, Insight collection and alerts.

- **Emulated Test -**

- Imitates a browser to request and load both the primary URL and any child elements referenced by it. This monitor does not execute JavaScript or style sheets.

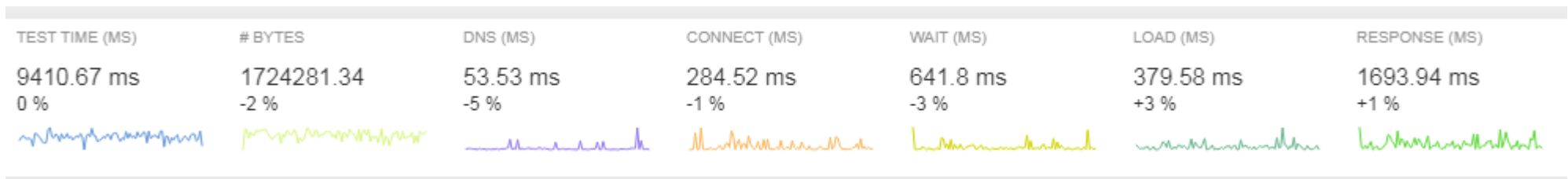
Use Cases

- High frequency, Availability monitoring of not just the base page, but the core elements / resources referenced by that page.

Metrics and Benefits

- DNS, Connect, SSL, Send, Wait, Time to First Byte, Load, Response, Redirect time, Server Response, File Size, Downloaded Bytes, Throughput, Wire Time, Availability. All on an overall or per page basis.
- Multiple metrics to help determine if a network or server issue, as well as extra insights from the Headers and Response to reduce MTTD.

#	Path/File	Host	IP Address	Connection Id	HTTP Method	Response Code	Content Type	Header Size	File Size	DNS	Connect	Send	Wait	Load	Response	Start	End	610.5	1221
1	/	www.catchpoint.com	13.248.141.96	1	GET	301	text/html	199	166	39	10	0	9	0	58	0	58		
2	/	www.catchpoint.com	13.248.141.96	2	GET	200	text/html	444	34,815	< 1	10	0	22	15	74	59	133		
3	s/catchpoint-final.89d0901e9.css	assets-global.website-files.com	99.84.126.66	5	GET	200	text/css	586	54,587	16	8	0	11	11	85	139	224		
4	d116093ab6516094d159_Favicon.png	assets-global.website-files.com	99.84.126.66	4	GET	200	image/png	565	41,707	24	8	0	11	10	92	156	248		
5	/libs/jquery/2.1.4/jquery.min.js	ajax.googleapis.com	172.217.12.202	10	GET	200	text/javascript; charset=utf-8	651	84,380	4	20	0	10	23	85	156	241		
6	/yper.js/pr-1/src/jquery.typer.js	cdn.rawgit.com	151.139.237.11	7	GET	200	application/javascript; charset=utf-8	509	1,856	4	9	0	4	0	242	157	399		
7	c237d28340e1241e5dcbcc_cloud.svg	assets-global.website-files.com	99.84.126.66	11	GET	200	image/svg+xml	559	590	29	27	0	7	0	95	157	252		
8	c2387e73f2300298ce527c_broad.svg	assets-global.website-files.com	99.84.126.66	6	GET	200	image/svg+xml	559	609	22	8	0	10	0	78	158	236		
9	92473f230ac8cce554f_lastmile.svg	assets-global.website-files.com	99.84.126.66	8	GET	200	image/svg+xml	559	545	29	11	0	62	0	139	158	297		
10	dc239859dcd8e42d7a16fd6_wifi.svg	assets-global.website-files.com	99.84.126.66	3	GET	200	image/svg+xml	558	450	22	7	0	15	0	85	158	243		
11	/forms/v2.js	js.hsforms.net	104.17.186.73	12	GET	200	application/javascript; charset=utf-8	1,116	118,332	3	16	0	34	13	108	158	266		



Web Test – Mobile Test

The Catchpoint Web test offers crucial insight to the performance of your webpage. The test examines a single URL, you can customize how that resource is investigated by choosing the type of monitor, including additional elements to the HTTP request header, and defining advanced settings such as Traceroute. Additionally, you can override the default values set up at the Product and Folder level for targeting, scheduling, authentication, HTTP requests, Insight collection and alerts.

- Mobile Test –
 - Utilizes Chrome’s mobile emulation capabilities to monitor mobile website availability and performance

Use Cases

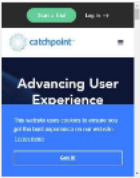
- Monitor availability, performance, reachability and reliability of your mobile pages and user journeys to ensure users have a great experience
- Monitor core user journeys like search, login, go to checkout etc.
- Monitor 3rd-party impact on performance
- SLA Management over 3rd parties
- CDN governance. Ensuring the correct CDN server is being used in each region and is performant
- Monitor mobile site on different emulated mobile handset browsers

Metrics provided on overall tests, as well as on a per page basis for a multistep transactions

- DNS, Connect, SSL, Send, Wait, Time to First Byte, Load, Response, Redirect time, Server Response, File Size, Downloaded Bytes, Throughput, Wire Time, Availability, Number of Items, number of Connections, Number of Hosts,

Benefits

- Ability to ensure mobile site correctly gets displayed based on viewport and/or user agent.
- Monitor over 3g, 4g and more to ensure performance over slower speeds globally.
- Multiple metrics to enable troubleshooting issues, whether network or application. Reducing MTTD.

	Webpage Response (ms)	Render Start (ms)	DNS (ms)	Wait (ms)	# Wire / Total Requests	# Hosts	# Failed Requests
	3,986	916	0	32	112 / 112	17	0
	Document Complete (ms)	Speed Index	Connect (ms)	Response (ms)	# Connections	Downloaded Bytes	# JS Failures
	1,778	NA	18	142	17	5,842,331	0

Web Test – Real Browser

The Catchpoint Web test offers crucial insight to the performance of your webpage. The test examines a single URL, you can customize how that resource is investigated by choosing the type of monitor, including additional elements to the HTTP request header, and defining advanced settings such as Traceroute , Filmstrip, Screenshot capture and bandwidth throttling. Additionally, you can override the default values set up at the Product and Folder level for targeting, scheduling, authentication, HTTP requests, Insight collection and alerts.

- **Internet Explorer or Chrome tests–**

- **Utilizes actual Chrome or IE to load your webpage to see total performance and availability of all items as they load and render in a browser window.**

Use Cases

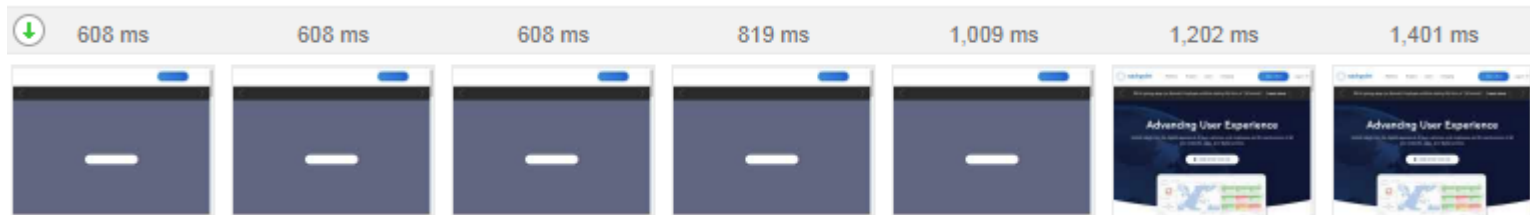
- Monitor availability, performance, reachability and reliability of individual pages, home page, search results, PLP. Login page, landing pages etc
- Monitor 3rd party impact on performance.
- SLA Management over 3rd parties
- CDN governance. Ensuring the correct CDN server is being used in each region and is performant.

Metrics provided on overall tests, as well as on a per page basis for a multistep transaction

- DNS, Connect, SSL, Send, Wait, Time to First Byte, Load, Response, Redirect time, Server Response, File Size, Downloaded Bytes, Throughput, Wire Time, Availability, Number of Items, number of Connections, Number of Hosts, Frames per Second, Failed requests, JS Failures, First Paint, First Contentful Paint, Time to Interactive, Visually Complete.

Benefits

- See how the complete page loads within a real browser.
- Understanding the performance and effect of elements on the page. Stylesheets large images, JavaScript, rendering time, etc.
- Precise data to enable paths for optimization. And then being able to see how any changes have affected performance.
- Having data to provide to 3rd parties or partners to prove any behavior that you are seeing.
- Add Filmstrip to see how the page builds up over time.



Transaction Test – User journey monitoring of desktop and mobile websites

The Catchpoint Transaction test type allows the ability to record and monitor the performance and availability of full user journeys. Capturing metrics at both network and application level for all components of every page.

Additionally, you can override the default values set up at the Product and Folder level for targeting, scheduling, authentication, HTTP requests, Insight collection and alerts.

- **Transaction test**

- **Utilizes actual IE or Chrome to monitor performance and availability of core user journeys through your website.**

Use Cases

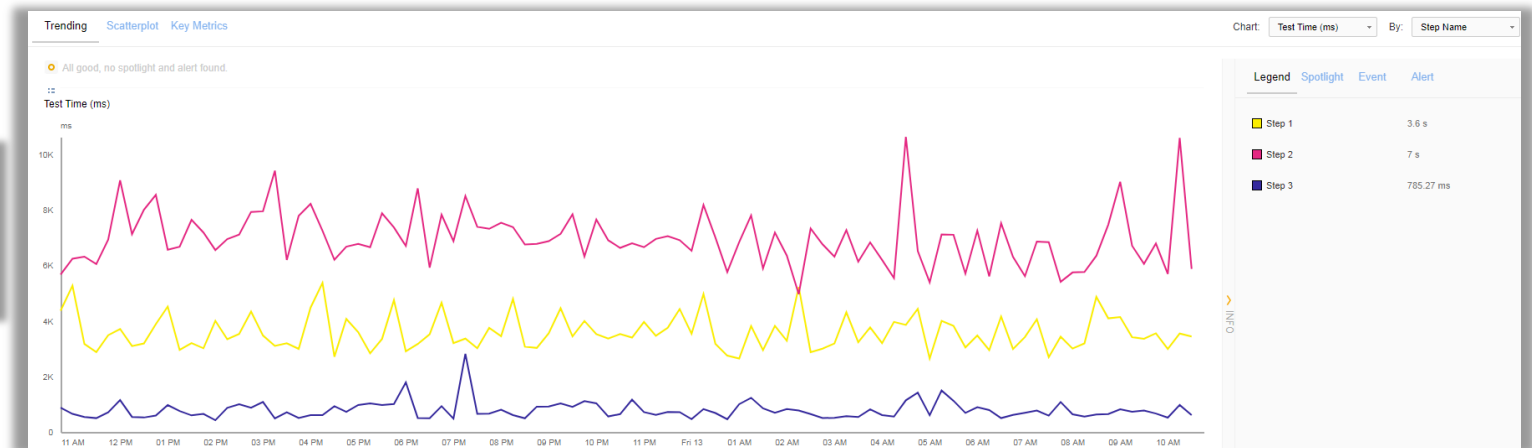
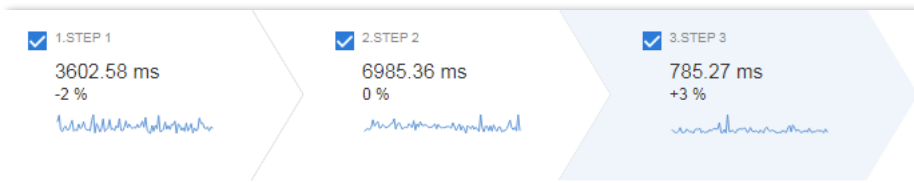
- Monitor availability, performance, reachability and reliability of your site's pages and user journeys to ensure users are able to have a great experience through their entire journey.
- Monitor the flow through the site is successful. Be it search, login, checkout, form fills and anything else.
- Observe 3rd party performance on your site

Metrics provided on overall tests, as well as on a per page basis for a multistep transaction

- DNS, Connect, SSL, Send, Wait, Time to First Byte, Load, Response, Redirect time, Server Response, File Size, Downloaded Bytes, Throughput, Wire Time, Availability, Number of Items, number of Connections, Number of Hosts, Frames per Second, Failed requests, JS Failures, First Paint, First Contentful Paint, Time to Interactive, Visually Complete.

Benefits

- Able to troubleshoot any issues faced with any element on any step of a multistep transaction. Be it network or application.
- Ensure that end-users can perform critical tasks on your website and know before them if there are any issues



API Test – Monitoring of API Endpoints

The Catchpoint API test type allows the ability to record and monitor the performance, availability and content of API responses (GET, POST, DELETE and PUT). Capturing metrics at both network and application level for all components of every page.

Additionally, you can override the default values set up at the Product and Folder level for targeting, scheduling, authentication, HTTP requests, Insight collection and alerts.

- **API test**

- **Monitoring of API Endpoints.**

- **Use Cases**

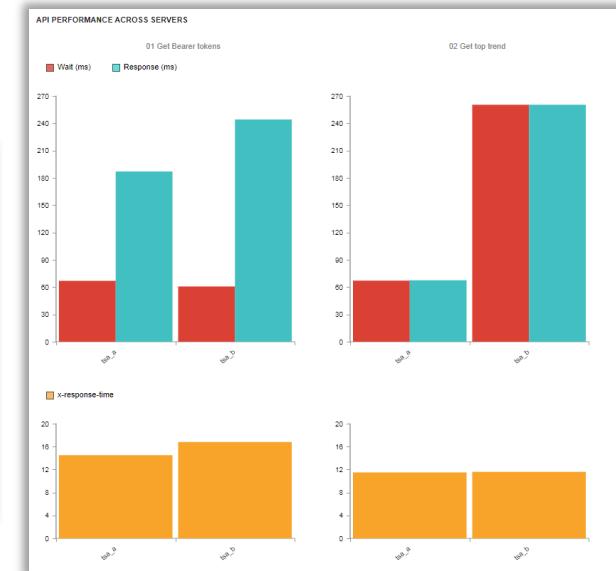
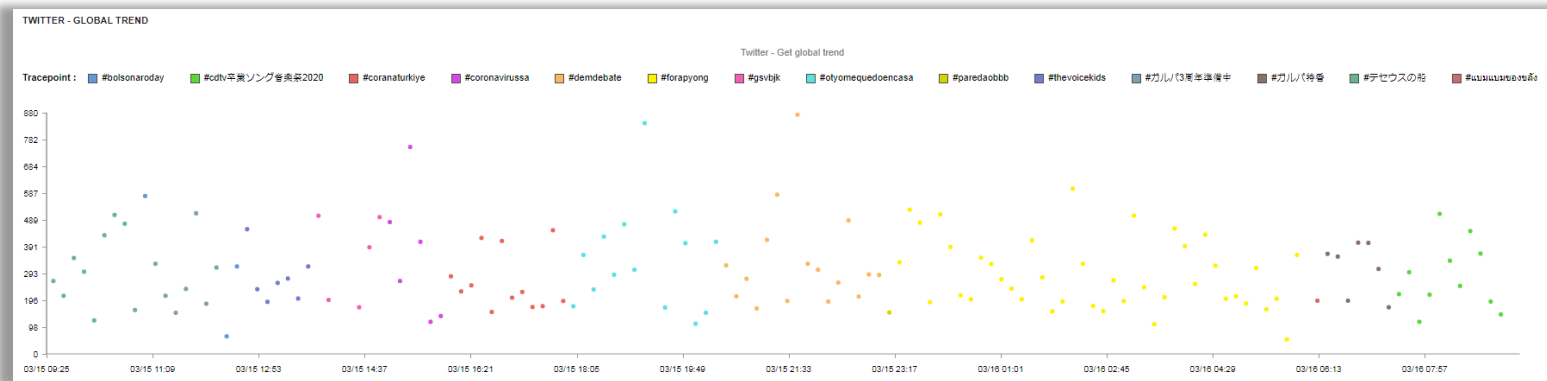
- Monitor availability, performance, reachability and reliability of your API endpoints.
 - Ensure that the data returned by the API call is valid via content assertions.
 - SOAP and REST API
 - Multistep API calls to monitor a journey.
 - Validate and reuse variables extracted from API in same test, or other test types using Global Variables

- **Metrics provided on overall tests, as well as on a per page basis for a multistep transaction**

- DNS, Connect, SSL, Send, Wait, Time to First Byte, Load, Response, Redirect time, Server Response, File Size, Downloaded Bytes, Throughput, Wire Time, Availability. All on an overall or per page basis.
 - Multiple metrics to help determine if a network or server issue, as well as extra insights from the Headers and Response to reduce MTTD.

- **Benefits**

- Able to troubleshoot any issues faced an API response
 - Ensure your API is returning the correct content as expected.



Network Insights – DNS Monitoring

The Catchpoint DNS test type allows the ability to monitor DNS servers directly, or the whole end-user DNS Lookup Experience.

- **DNS test**
 - **Monitoring of DNS lookup from specific DNS servers, or the complete DNS trace.**

Use Cases

- Monitor individual answers from DNS Servers.
- Monitor 3rd party DNS providers and hold them accountable
- Ensure DNS Lookup is performant.
- Get alerted if any DNS high jacking occurs. Poisoning or redirection
- Monitor DNS propagation times

Benefits

- Providing full DNS trace to give visibility into which stage of the DNS process maybe having issues.
- Level by Level analysis

Response (ms) : 17 Error : None # A : 2 # AAAA : 0 # Cname : 1 # Ns : 20

LEVEL 1

LEVEL 2

LEVEL 3

LEVEL 4

Group 1

Address	Average Time (ms)	Bytes	Return Code	Error
205.251.198.186.53 [ns-1722.awsdns-23.co.uk]	< 1	0	None	

Query : proxy-ssl.webflow.com. Type : A (IPv4 Host Address) Class : IN (Internet)

Answers

Name	TTL	Class	Type	Info
proxy-ssl.webflow.com.	60	IN (Internet)	A (IPv4 Host Address)	13.248.141.96
proxy-ssl.webflow.com.	60	IN (Internet)	A (IPv4 Host Address)	76.223.9.102

Authoritative Nameservers

Name	TTL	Class	Type	Info
webflow.com.	172.800	IN (Internet)	NS (Authoritative Name Server)	ns-1078.awsdns-06.org.
webflow.com.	172.800	IN (Internet)	NS (Authoritative Name Server)	ns-1722.awsdns-23.co.uk.
webflow.com.	172.800	IN (Internet)	NS (Authoritative Name Server)	ns-344.awsdns-43.com.
webflow.com.	172.800	IN (Internet)	NS (Authoritative Name Server)	ns-958.awsdns-55.net.

Network Insights – Ping and Traceroute

- Ping Test

- The Ping test provides metrics related to round trip time (RTT) and packet loss to a specified server. The ping sends five packets of roughly 64 bytes each.

Use Cases

- Test if particular hosts are reachable.
- Ping servers using either ICMP, UDP and TCP
- Monitor both internally and externally the availability and reachability of any host

The following metrics are displayed for Ping tests.

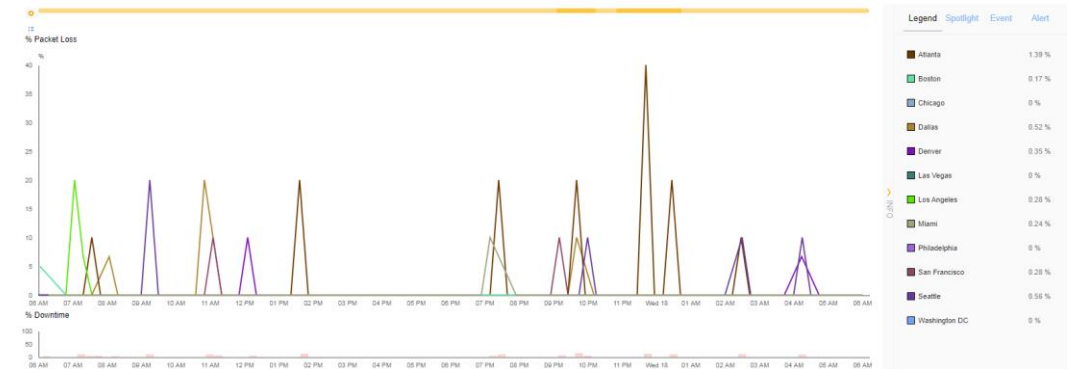
Ping Time: The time it took to send a packet.

Average Time: The average time of the Pings.

Packet Loss: The amount of dropped packets for the Pings.

Address: The IP Address and hostname for the destination.

Status: Indicates if the Ping was a success or failure.



- Traceroute test

- The Traceroute test runs in standard or Paris mode to analyze traffic routing. The test sends three packets per hop; each packet totals roughly 64 bytes

Use Cases

- Network Path analysis

The following metrics are displayed in the waterfall for Traceroute tests.

Duration, Hop, Ping Time, Average Time, Packet Loss, Address, AS Number, City, Country.

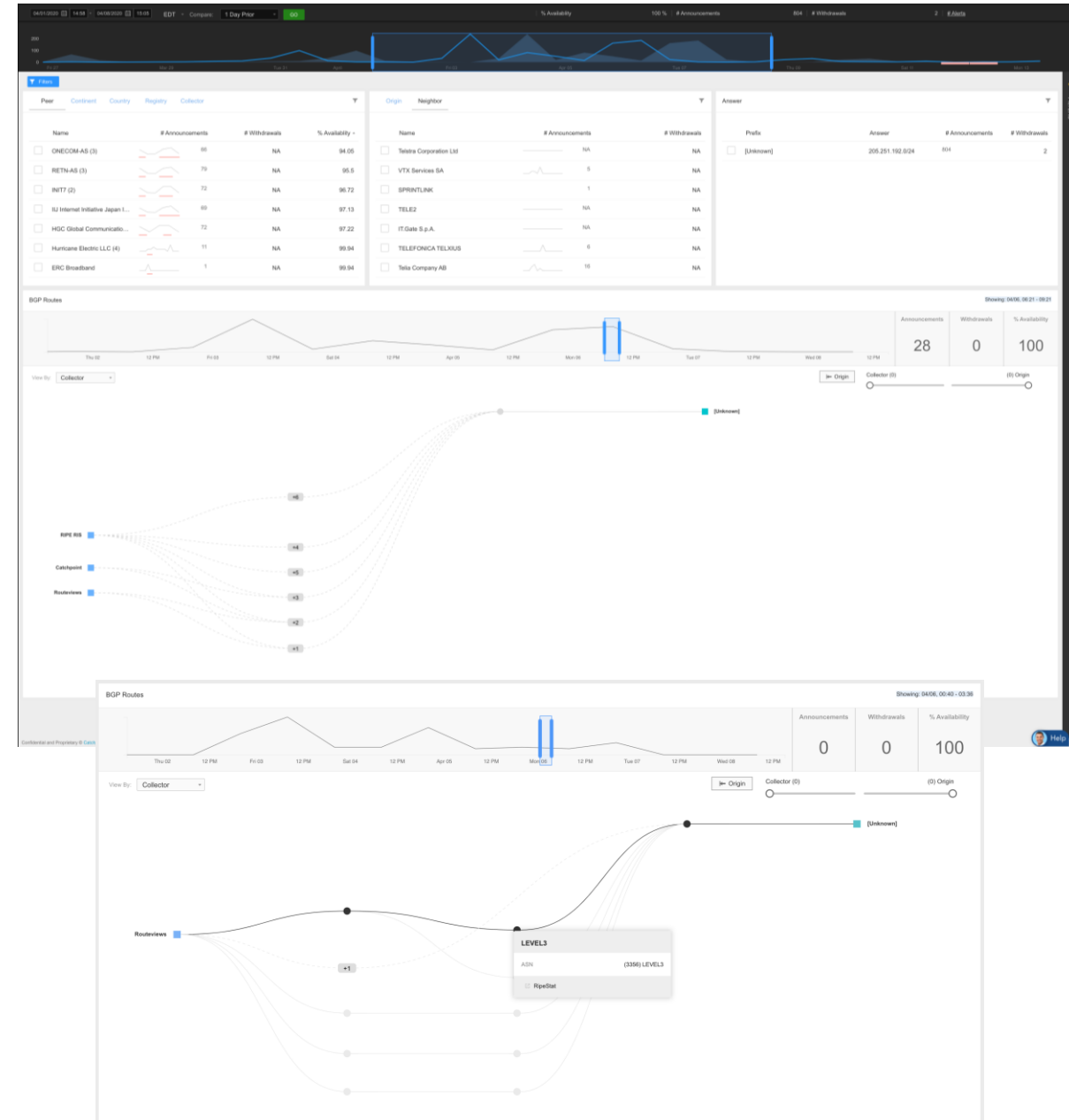
Network Insights – BGP

• BGP Monitor

- The Catchpoint BGP Monitor allows you to monitor your announced prefixes (eBGP) from hundreds of autonomous system (AS) peers, which share their full BGP tables with Catchpoint monitoring nodes located around the world.
- BGP monitoring is critical because it is a highly vulnerable protocol, subject to route leaks and hijacks. Misconfigured or malicious sources can widely propagate bogus routing information with ripple effects across the Internet. As the usage of the cloud to build apps and services has become more prevalent and interactions more complex, it has become more important than ever to monitor BGP.
- Catchpoint collects BGP data from peers that share their data with the following organizations:
 - RIPE NCC – a public data source for RIPE NCC, the European Internet Registrar.
 - Route Views Project – a public data source based out of the University of Oregon with data published every 15 minutes.
 - Catchpoint – our private data source, through which Catchpoint has established its own relationships to derive full BGP tables from routers
- Based on the specific peer, the Catchpoint private portal derives the following information:
 - AS – the actual organization and autonomous system number (ASN) of the entity sharing the BGP tables.
 - Registry – the Internet registry the AS of the peer is registered with.
 - Geographical information:
 - Country – the country where the router sharing the BGP tables is geographically located.
 - Continent – the continent where the router sharing the BGP tables is geographically located.

Based on the data collected from the prefix, the Catchpoint portal derives the following information:

 - Origin – the AS that the prefix belongs to.
 - Neighbor – the neighbor to the origin AS, or the next in path.
- Alerting Thresholds and Triggers Include :
 - Test Failure
 - Availability %
 - Origin AS Validation
 - Origin Neighbor Validation
 - AS Path Validation
 - Prefix Mismatch



Transport

The Transport test monitors the performance and availability of a connection to a given host and port using the TCP or UDP protocol. Creating a test involves defining the host and port you want Catchpoint to test, and the request data you want Catchpoint to send in plain text, HEX or Base64 encoded data.

- **Transport test**

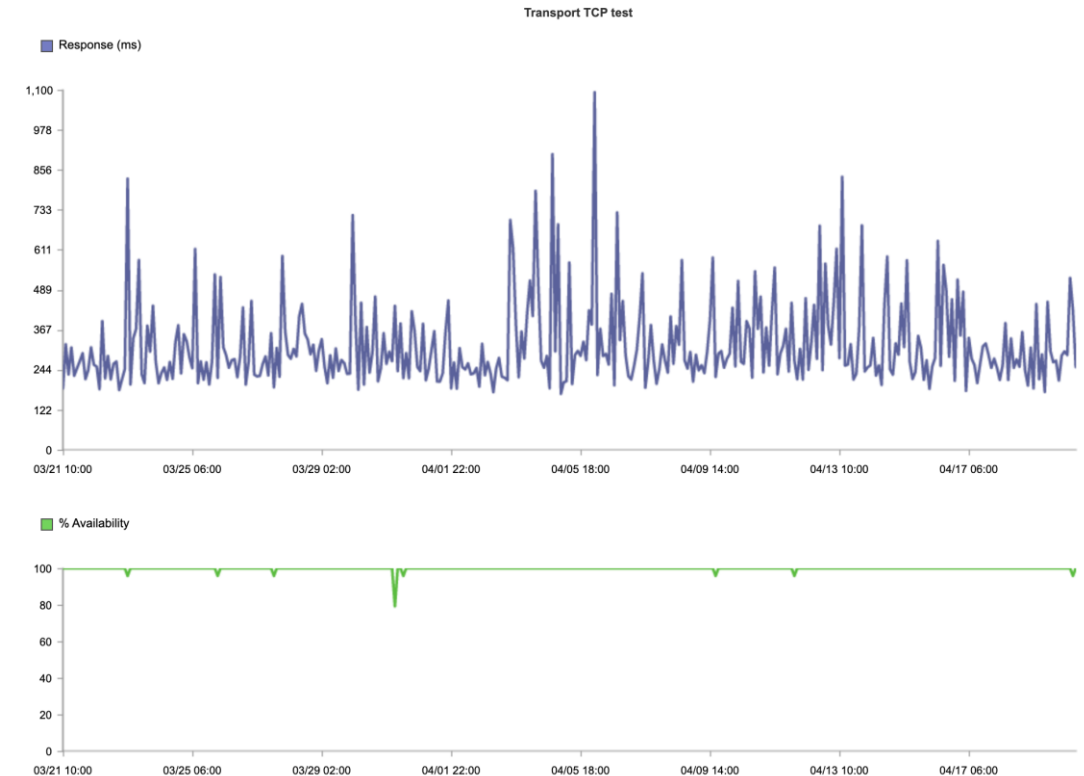
- **Monitoring of Transport Protocols (TCP & UDP).**

- Use Cases**

- **Verify TCP and UDP connections to specific host on a given port**
 - **Measure end to end latency when send requests to given hosts**
 - **Extremely useful for measuring latency in built for low latency such as financial transactions and gaming applications.**

- Metrics provided:**

- **DNS Lookup Time**
 - **Connection**
 - **Server Wait**
 - **Send Time**
 - **Overall Response Time**
 - **Time to Send and Receive Payload**
 - **Payload Size Sent and Size Received**



Test Location : www.bitcoin.org:80

IP Address : 138.68.248.245

Response (ms)

203

DNS (ms)

37

Connect (ms)

85

Wait (ms)

< 1

Send (ms)

< 1

Send (Bytes)

68

Receive (ms)

81

Receive (Bytes)

311

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Identify issues with mail servers and keep track of mail server failures

Email

Catchpoint offers the ability to monitor the two major mail protocols – IMAP and SMTP. These tests allow you to monitor the performance and availability of your mail servers by establishing a connection and issuing various commands. The IMAP protocol is primarily used to list folders, search messages, and fetch message contents, but for servers that support it, IMAP can initiate sending messages by moving them to the Sent folder. The SMTP test allows monitoring authentication to the mail server and sending an email.

- **IMAP and SMTP test - Monitoring of Mail Servers**

Use Cases

- Monitor availability, performance, reachability and reliability of your mail servers
- Ensure your email server is allowing clients to connect, authenticate, and send mail
- Continuously monitor your mail server for SLO calculations and SLA validations with your end users and customers

Metrics provided on overall mail transaction, as well as on a per command basis

- SMTP : DNS, Connect, SSL, Authentication Time, Message Size, Helo Time,
- IMAP : DNS, Connect, SSL, Authentication Time, Fetch Time, Search Time, List Time, Send Time, Logout Time, Message Size

Benefits

- Ability to troubleshoot issues with specific Mail commands
- Ability to monitor performance of mail servers and time it takes to send mail
- Ability to monitor security of end-user credentials via authentication to mail servers

IMAP

Test Location : .com

IP Address :

Response (ms)	DNS (ms)	Connect (ms)	Wait (ms)	Authentication (ms)	Logout (ms)	Search (ms)	Send (ms)	Message Size (Bytes)
317	3	158	NA	156	29	55,368	858	604

SMTP

Test Location :

IP Address :

Response (ms)	DNS (ms)	Connect (ms)	Wait (ms)	Helo Time (ms)	SSL (ms)	Authentication (ms)	Send (ms)	Message Size (Bytes)
9,745	< 1	23	66	25	192	65	9,374	122



Identify issues with mail servers and keep track of mail server failures

WebSocket – Performance and Availability of a WebSocket Connection

Catchpoint's standalone WebSocket monitor checks the performance and availability of connecting to a server via a WebSocket connection. Often used in chats, financial tickers, and gaming applications, WebSockets allow for simultaneous real-time communication between client and server through a single persistent connection. With the WebSocket Test you can establish a connection, send data, assert the server response, and create custom metrics based on the response.

- **WebSocket Test**

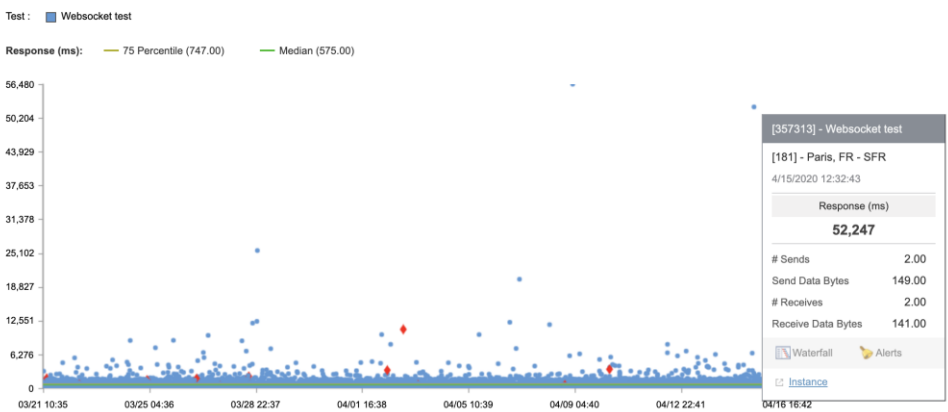
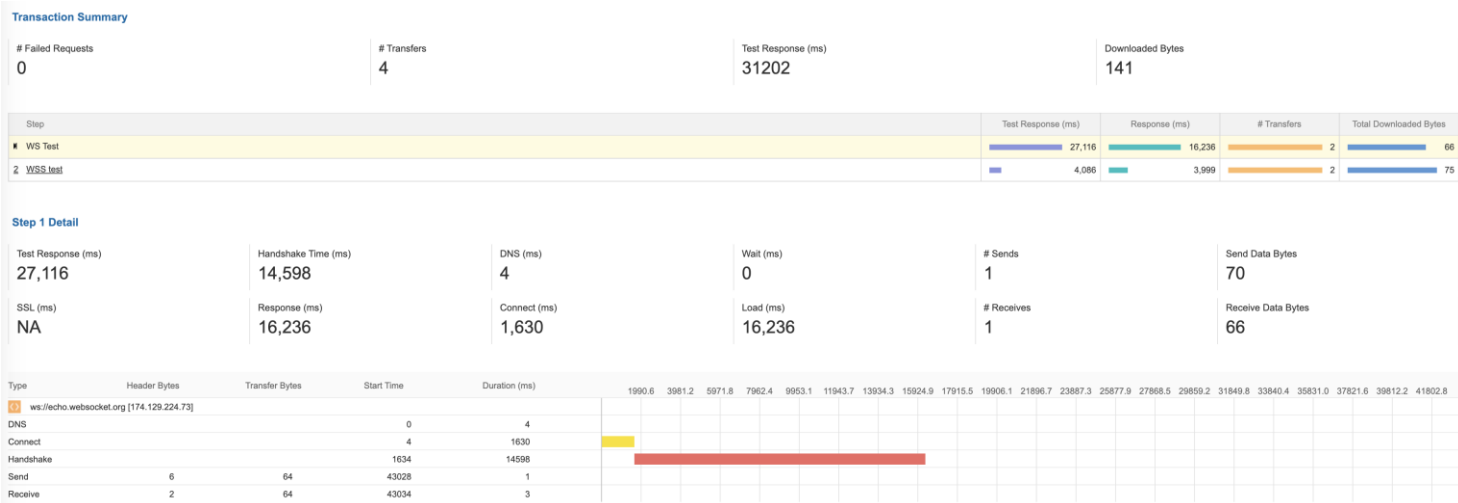
- **Monitor the WebSocket protocol**

- Use Cases**

- Check that you can connect to a server via WebSockets and send data over that connection.
 - Interact with WebSockets via a scripted transaction to send data and parse data programmatically.

- Metrics provided**

- DNS Time, TCP Connect Time, Server Wait Time, Load Time, Secure Handshake Time, Payload Size Sent and Received
 - Parse out response to store as custom metrics



SSH – Monitor the performance and availability via a SSH client connection to a server

Catchpoint's standalone SSH monitor checks the performance and availability of connecting to a server via the Secure Shell protocol. SSH is a cryptographic network protocol for operating network services securely over an unsecured network.^[1] Typical applications include remote command-line, login, and remote command execution, but any network service can be secured with SSH.

- SSH Test

- Monitor the SSH protocol

- Use Cases

- Check that you can connect to a server via SSH and execute remote command-line functions.
 - Measure time to connect to server, time spent authenticating and securing the connection, and the time taken to execute the given command
 - View and parse the output of the command via the messages printed to STDOUT

- Metrics provided

- DNS Time, TCP Connect Time, Command Execution Time, Command Execution Result Size, Key Exchange Time, Authentication Time, and Shell Return Code

- Benefits

- Ensure that critical servers can be securely connected into remotely and that they properly respond to critical remote commands

IP Address : 205.166.94.8

DNS (ms)	Connect (ms)	Exec Command Time (ms)	Exec Command Results (Bytes)	Key Exchange Time (ms)	Authentication (ms)	Return Code
< 1	134	NA	0	98	0	NA

STDOUT

```
[root@CP /]# catchpoint --help
usage: catchpoint [-h|--help] [-v|--version] <command> [<args>]

COMMANDS:
  start      - Start all Catchpoint Enterprise Node services
  stop       - Stop all Catchpoint Enterprise Node services
  restart    - Restart all Catchpoint Enterprise Node services
  status     - Shows the Status of all Catchpoint Enterprise Node services
  update     - Update Catchpoint Enterprise Node to it's latest version
```

FTP – Monitor the protocol used for the transfer of files between a client and a server

Catchpoint's standalone FTP monitor checks the performance and availability of connecting to a server via the File Transfer Protocol and that files can either be uploaded or downloaded as needed.

- **FTP Test**
 - **Monitor the FTP protocol**
 - Use Cases**
 - Check that you can connect to a FTP server and either upload or download files.
 - Supports both active and passive FTP modes (*passive mode is typically used when server is behind a firewall and cannot accept TCP connections*)
 - Full support for FTPS (Secure File Transfer Protocol) and SFTP (FTP over an SSH Tunnel)
 - Metrics provided**
 - DNS Time, Response Times, File Size, Time to Get the File, Time to Delete File, Time to Upload File
 - Benefits**
 - Ensure that critical document servers can be securely connected into and that files can be properly uploaded and downloaded as needed

Test Location : ftp://speedtest.tele2.net/1000GB.zip

IP Address : 90.130.70.73

Response (ms)	DNS (ms)	Get (Bytes)	Get (ms)	Delete (ms)
181	35	1,073,741,824,000	146	0

Test Location *: ftp://speedtest.tele2.net/1000GB.zip

(ftp{s}://hostname/path/filename.ext or for upload ftp{s}://hostname/prefix\${random}.ext)

Request Type *: ☒ Upload ☒ Get ☐ Download ☒ Use Passive Connection

Upload Size(KB) *: 100 ☒ Delete file post successful upload (Enterprise max: 2,097,151KB; All other network types: 100KB)

Authentication : Basic Username *: username Password *:

SSL – Monitor the performance and validity of your SSL certificates

Catchpoint's standalone SSL monitor checks the validity of the certificate on a given host and port, performs certificate and public key pinning with a single certificate, and alert on various metrics, including the number of days until your certificate expires.

- **SSL Test**

- **Monitoring of your SSL Certificates**

- **Use Cases**

- Check the validity of SSL certificates installed on your web server and alert x days prior to expiry.
 - Detect certificate revocation, hostname mismatch, and if any certificate in the entire chain is signed by a weak algorithm.
 - This monitor supports certificate pinning and promotes your website's trustworthiness and ensures a secure environment for your website visitors.

- **Metrics provided and additional certificate details captured**

- DNS Time, Host Details, Connect Time, SSL Time
 - Version number, serial number, signature algorithm, issuer, issue date – not before and not after, subject, public key parameters, public key, key usage, extended key usage, certificate signature algorithm, certificate signature/thumbprint, authority information access, certificate policies, basic constraints, CRL distribution points, subject alternative name, subject key identifier, authority key identifier, certification path

- **Benefits**

- Expired certificates can negatively impact your organization's websites, applications, and security.
 - Expired SSL certificates compromise the trust and integrity of the site, making it vulnerable for hackers to target and breach.
 - When an SSL certificate expires and loses validity, secure networks and browsers may not allow access to your site, rendering it unavailable.

Host Address : 216.58.200.100

DNS (ms)
5

Connect (ms)
2,682

Handshake Time (ms)
1,454

Valid From	02/25/2020 20:44:26 UTC
Valid To	05/19/2020 20:44:26 UTC Expires in 62 days
Subject	CN=www.google.com, O=Google LLC, L=Mountain View, S=California, C=US
Subject Alternative Name	DNS Name=www.google.com
Certificate Thumbprint	Host : c5c05a9fc7841a18db82641d1b611553dad2d50e
URL	https://www.google.com

NTP – Monitor the performance and availability of an NTP Server

Catchpoint's standalone NTP monitor checks the performance and availability of NTP servers. NTP is the protocol used to keep computer system clocks in sync and is designed to mitigate network latency. There are various NTP servers located around the world which systems will connect to to keep clocks within a few milliseconds of real time.

- **NTP Test**

- **Monitor the NTP protocol**

- Use Cases**

- Check that your internal machines are connected to NTP server via Enterprise nodes.
 - Measure the clock offset of your critical systems via Public nodes.
 - Measure impact of clock offset on end user experience.

- Metrics provided**

- DNS Time, Response Time, Test Time, Local Clock Offset (Positive), Local Clock Offset (Negative), Round Trip Delay, Root Delay, Root Dispersion (Jitter)

- Benefits**

- Proactive insight into the NTP to ensure that your users have the most optimal experience.

Test Location : time.████.com

IP Address : 17.253.20.125

DNS (ms)	Response (ms)	Local Clock Offset (ms)	Root Delay (ms)	Round Trip Delay (ms)	Root Dispersion (ms)
22	6	-24.69765	15.6269	NA	0.1831

MQTT – Monitor the performance and availability of IoT Devices using MQTT Protocol

Catchpoint's standalone MQTT monitor checks the performance and availability of IoT devices using the MQTT protocol. The MQTT test can be used to publish/subscribe communications over MQTT by publishing and subscribing to a message for a specified topic and measuring how long it takes.

- **MQTT Test**
 - **Monitoring of your IoT devices using the MQTT protocol**
 - Use Cases**
 - Check the availability of IoT devices using the MQTT protocol.
 - Measure the performance of publishing/subscribing to a message for a specified topic.
 - Measure DNS and Network latency impact on MQTT protocol/IoT devices.
 - Metrics provided and additional certificate details captured**
 - DNS Time, Connect Time, Publish Time, Publish Size, Subscribe Time, Subscribe Size
 - Benefits**
 - Proactive insight into critical IoT devices/messaging.

Test Location : `mqtt://broker.hivemq.com`

IP Address : `3.123.239.37`

DNS (ms)	Connect (ms)	Publish Time (ms)	Publish Size (bytes)	Subscribe Time (ms)	Subscribe Size (bytes)
511	325	7	20	216	10

Streaming

Catchpoint's Streaming monitor allows you to monitor your live and on demand streams. The Streaming test uses an open source video player that is embedded into the Chrome browser. This is used by the test agent to control the video and play the stream while simultaneously capturing the performance metrics. The Streaming monitor can capture HTTP headers, Meta data and a screenshot on failures or always.

**Streaming is only available on an Enterprise Node.

- **Streaming Test**

- **Monitoring of your live and VOD streams using HLS and RTMP protocol**

- **Use Cases**

- Check the availability and performance of your streams
 - Ensure playback is working smoothly without any buffer
 - Validate stream

- **Metrics provided**

- DNS Time, Connect Time, SSL, Wait, Initial Buffer, Play, Total Buffer, Buffer Counter, Throughput

- **Benefits**

- Proactive insight into stream available, playback and performance

IP Address : 4.53.90.198

Response (ms)	Play (ms)	Buffer Counter	Throughput	Total Buffer (ms)
15,703	15,329	2	10830.01	226
DNS (ms)	Connect (ms)	SSL (ms)	Wait (ms)	Load (ms)
143	1	NA	4	15,407

Meta Data

```
{
  "audiochannels": 2,
  "avclevel": 30,
  "duration": 887.9786666666667,
  "type": "metadata",
  "tags": [],
  "audiocodecid": "mp4a",
  "audiosamplerate": 48000,
  "renderstate": "software",
  "stagevideo": "off"
}
```

Request Headers

```
GET /s/p/243342/sp/24334200/serveFlavor/entryId/0_c0r624gh/v/1/pv/1/flavorId/0_u48dtkyq/forceproxy/true/name/a.mp4?aeauth=1454262496_6de2b9816ce0d8f6fbef87eb25dfb269 HTTP/1.1
Host: cdnsecakmi.kaltura.com
Connection: keep-alive
X-Requested-With: ShockwaveFlash/18.0.0.160
User-Agent: Mozilla/5.0 (compatible; Windows NT 6.1; Catchpoint) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/43.0.2357.81 Safari/537.36
Accept: */*
Referer: http://127.0.0.1:50120/monitor/service/web/query?name=local-webserver&metrics=file=jsuplayer.html|STREAMER=http://www.kaltura.com/p/243342/sp/24334200/playManifest/entry
Accept-Encoding: gzip, deflate, sdch
Accept-Language: en-US,en;q=0.8
```

Response Headers

```
HTTP/1.1 200 OK
Server: nginx/1.8.0
X-Vod-Me: my-front-origin101
X-Vod-Session: 591505436
Access-Control-Allow-Origin: *
Expires: Thu, 05 May 2016 02:39:36 GMT
Cache-Control: max-age=8640000
Last-Modified: Sun, 19 Nov 2000 08:52:00 GMT
ETag: "3a1794b0-dc89c35"
Content-Type: video/mp4
```

Screenshot



Custom Monitor

Catchpoint's Custom Monitor lets users run their own code on an Enterprise Node. Users can create a script to monitor the performances of any service using any programming language. Once the code is written, just upload it to the Catchpoint Enterprise node and schedule a test. Catchpoint will execute the code based on frequency defined, process the output data, and collect the metrics. Custom Monitors are supported on both Linux and Windows Enterprise Nodes. The output of the script can be parsed using Catchpoint's Insight capability to parse both metrics as well as dimensions.

- **Custom Monitoring**

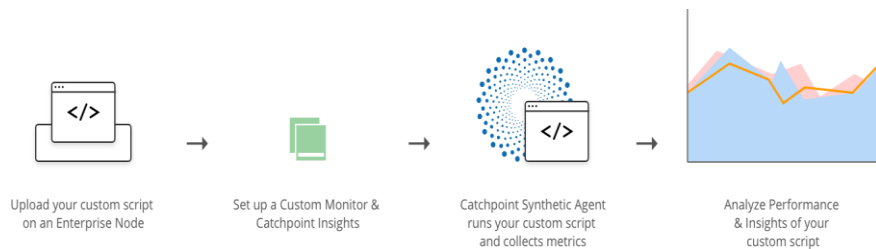
- Shell or a PowerShell script that tests any services for reliable output or response time can be converted into a custom monitor that can be executed in a 24/7 basis to report and alert on availability, reachability, reliability and performance.

- Use Cases**

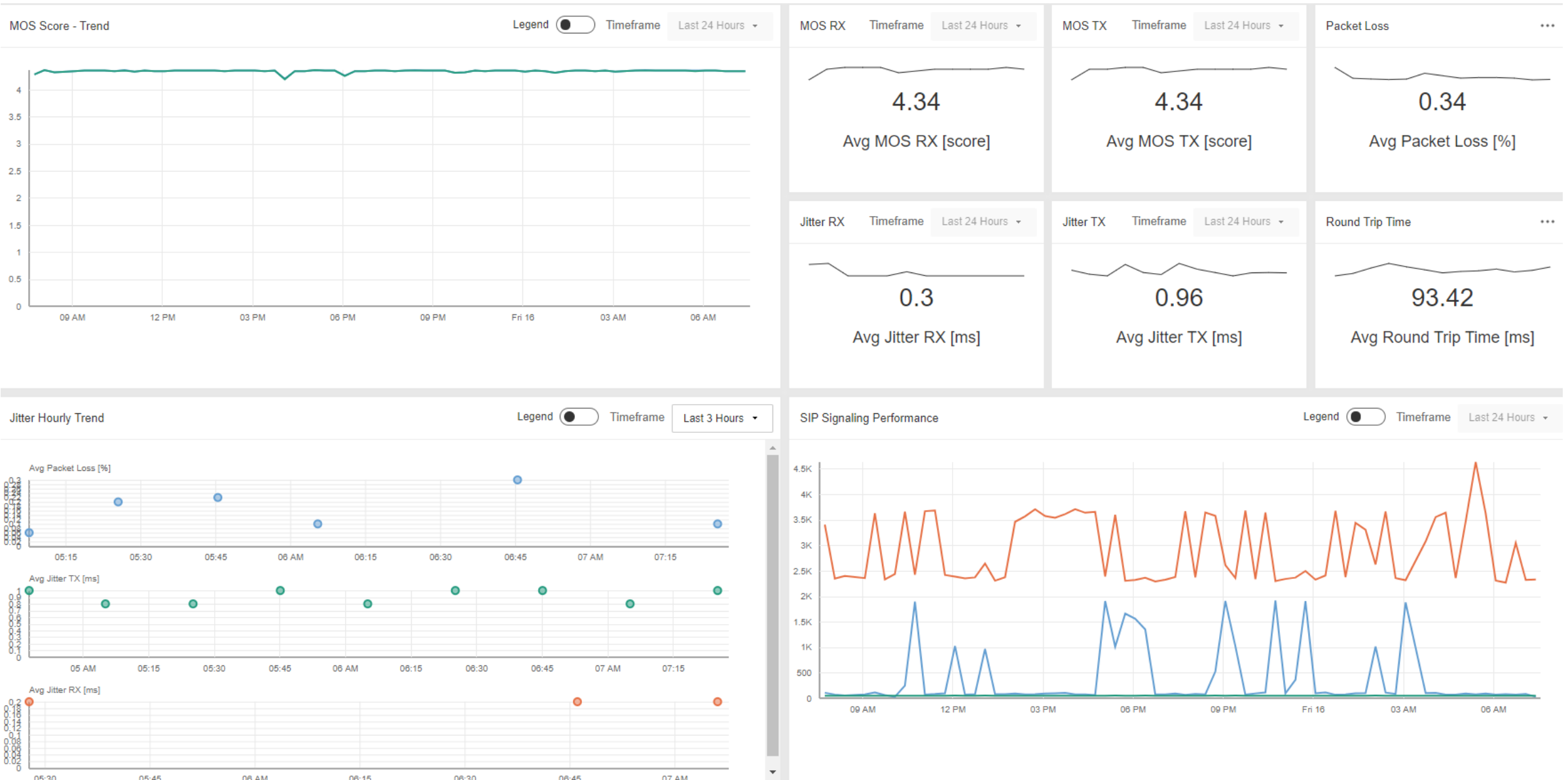
- Monitor connectivity, response time and availability of database servers. Could be any SQL/no-SQL database
 - Monitor native mobile apps via Appium, using emulator or real device, for UI errors and responsiveness
 - Monitor latency, Jitter and MOS for VoIP and SIP connections to improve call qualities offered by services such as Skype, Webex, Zoom, MS Teams etc
 - Monitor Google Lighthouse scores to understand how changes to application or its underlying infrastructure impact quality of web pages
 - Monitor, via Sentiments analysis, positive and negative keywords of organization's business name and services that it offers

- Metrics and Benefits**

- Convert any existing test scripts into monitors in Catchpoint that can be executed in a scheduled manner
 - Metrics to be collected are defined by customers as output of the script and can be anything from numbers to strings



Custom Monitor – VoIP over SIP example



Real User Monitoring

This solution captures data from real users to give insight into how they experience your website, application, or other service. It can be implemented by installing a JavaScript tag, an iOS SDK, or through an API for a Site or Mobile Container. The data will provide answers to IT, Marketing, and Business teams about past and current trends as well as troubleshoot issues that occur at application, network, and device layers.

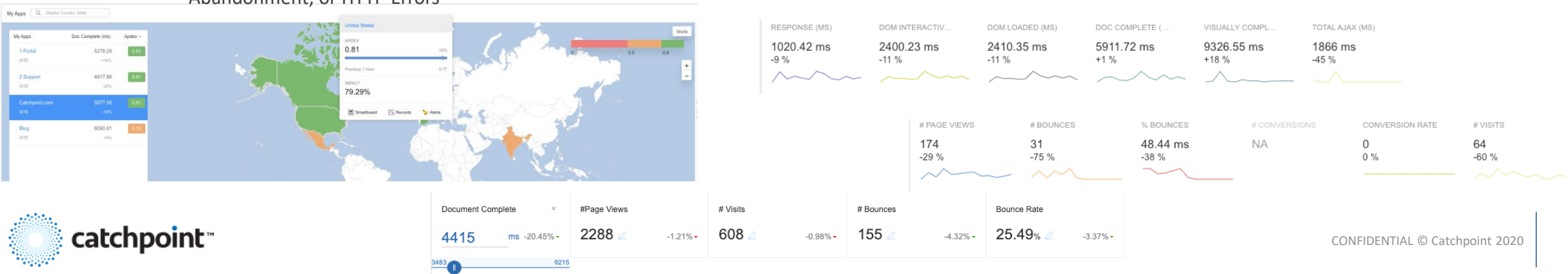
- **Real User Monitoring**
 - The JavaScript tag collects application, network and device data utilizing the browser and navigation timing APIs, then beacons the data back to Catchpoint for reporting, dashboarding and alerting. The iOS SDK utilizes an SDK packaged with your iOS app to capture the data. The Site and Mobile containers utilize your own custom code in your app to gather the data and sends back to Catchpoint via an API.

Use Cases

- Real user reports slow performance. **Troubleshoot** – is it the application? Is it the network? Is it the device?
- Added a new tag to your site. **Measure** its performance impact across different pages, regions, devices, browsers and networks
- **Quantify** the impact of a performance issue or an app outage across your user base
- **Monitor** your conversion/revenue and the impact that performance and other site changes have on these business-critical metrics
- **Correlate** performance and end user experience metrics with business outcomes (Conversation and Revenue) and predict using the **Real User Estimator**

Metrics and Benefits

- **End User Experience** – All Request Component metrics (DNS->Load), Visually Complete, First Paint, First Contentful Paint, TTI, First Input Delay, Document Complete, AJAX time, #requests, #JS errors per page
- **End User Device** – Device, Browser, Browser Version, ISP, and other Location based information
- **Tag Tokens** – Unique identifiers associated with Page Group, Variation, Insight, and Conversion
- **Records** – Page level insights to understand if an entire app is prone to issues or only a certain section of the application
- **Network Error Logging** - Detect when Real Users are unable to access your applications due to various errors such as DNS, Connection, Page Abandonment, or HTTP Errors



Endpoint Monitoring

Endpoint Monitoring captures employee experiences related to business-critical applications from employee’s workstations. It is comprised of a browser plugin and a desktop agent that is installed on users’ workstations, which provides answers to IT teams to troubleshoot issues that occur at application, network and device layers. The solution runs active network trace to all business-critical applications to catch connectivity issues before users are impacted. The solution can be customized to whitelist only those application that need to be monitored and also, be installed via Group Policy Objects, remote management like LogMeIn, or via adding registry items.

- **Endpoint Monitoring**
 - Browser plugin and a native agent that collects application, network and device level data from employee’s devices, beacons the data back to Catchpoint SaaS platform for reporting, dashboarding and alerting

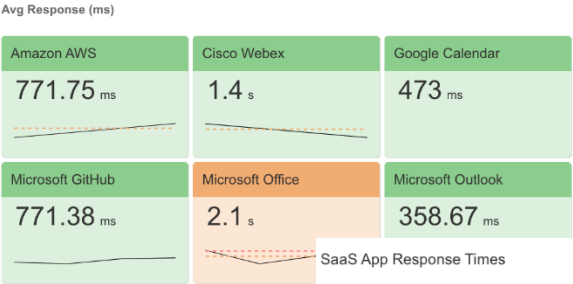
Use Cases

- Employee reports slow performance. **Troubleshoot** – is it the application? Is it the network? Is it the device?
- Procured a new SaaS Software. **Measure** its performance across different office/remote locations, devices, browsers and networks
- **Quantify** the impact of a performance issue or an app outage across the organization
- **Monitor** network connectivity to business-critical applications actively to catch issues before users are impacted

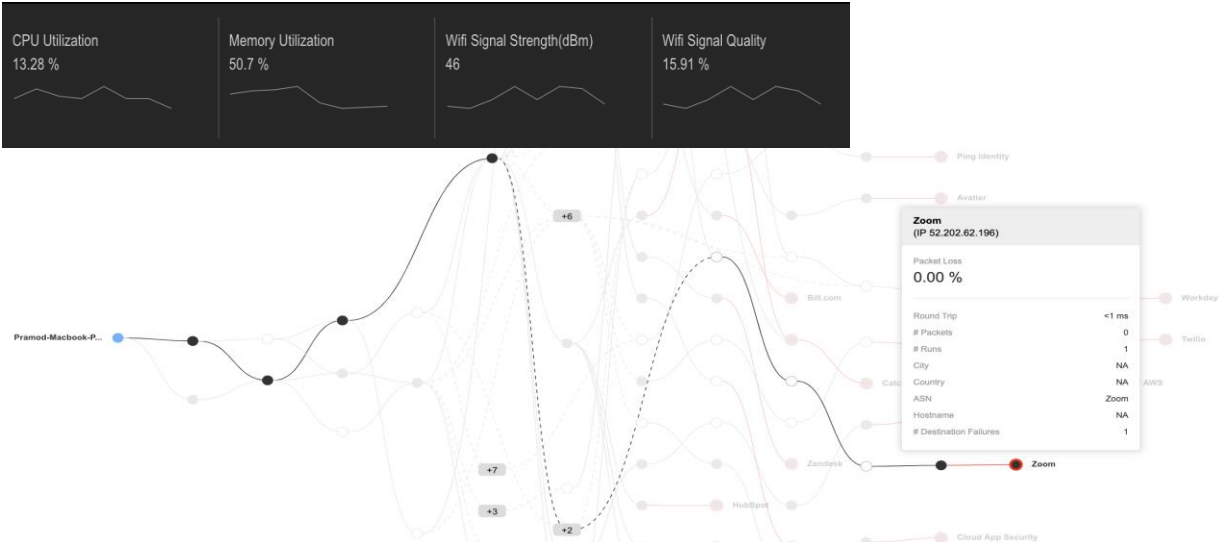
Metrics and Benefits

- Application – Visually Complete, First Paint, First Contentful Paint, TTI, First Input Delay, Document Complete, AJAX time, #requests, #JS errors per page
- Network – RTT, %packet loss, DNS, TCP Connect, SSL time, Time To First Byte
- Device – CPU, Memory, Wi-Fi Signal Strength and Quality, Browser Version, OS version, Device, Screen Resolution, Geographical location and ISP
- Page level insights to understand if an entire app is prone to issues or only a certain section of the application

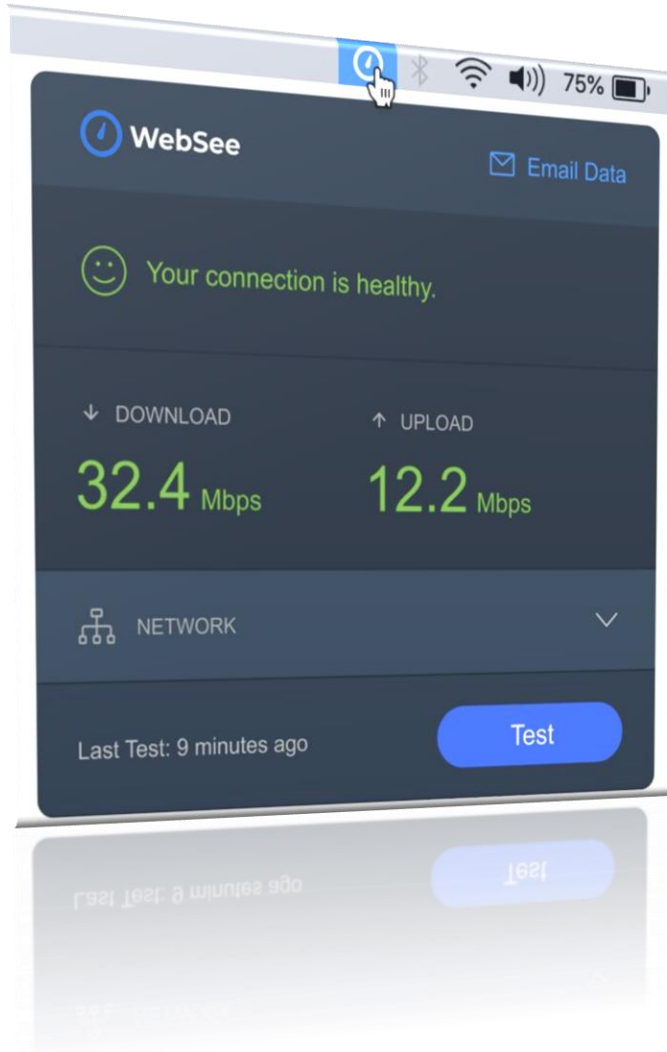
SaaS App Response Times



Avg Response (ms) > Microsoft Office



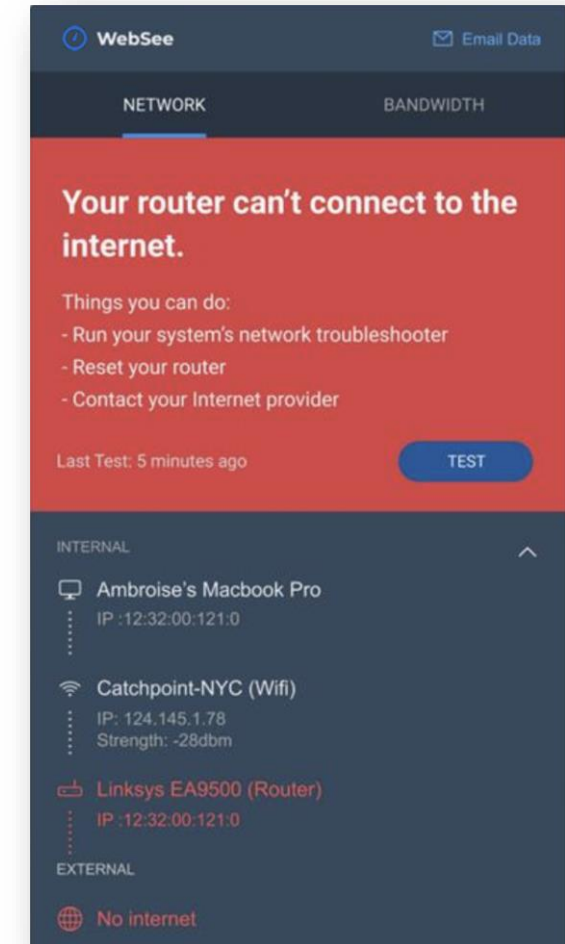
Empower employees to self-remediate device and network problems.



Enable end users with a small desktop app which allows them to run their own diagnostics.

Troubleshooting tips

They can send that data to their support team directly.



SLA Monitoring and SLA Classification

View SLA data in a simple dashboard, for both Availability and Performance. In a simple dashboard. Select different time periods, like Month to Date and Year to Date.

SLA Dashboard						
Test name	% Availability			Test Time (ms)		
	Month to date	Quarter to date	Year to date	Month to date	Quarter to date	Year to date
Microsoft Live	100	100	98.25	14575.9	14575.9	12725.48
Catchpoint Excel	100	100	98.95	12014.37	12014.37	13974.34
Catchpoint OneNote	99.99	99.99	99.82	1197.9	1197.9	3232.67
Catchpoint Power BI	99.95	99.95	99.78	7429.09	7429.09	12091.8
Catchpoint Outlook	99.94	99.94	94.7	13966.23	13966.23	15290.51
Catchpoint OneDrive	99.93	99.93	92.16	11361.64	11361.64	9318.61
Catchpoint Yammer	99.86	99.86	98.65	13116.59	13116.59	15703.65

SLA Classification enables the possibility of reclassifying data so that it doesn't affect the SLA figures. This provides flexibility to ensure that SLA figures are not skewed by incidents which do not apply to the agreement

Name *:

Status *: ☐ Active ☐ Inactive

Tests *

Start Date *: PT - End Date *: PT -

Purge Runs *: ☐ All Runs ☐ Failed Runs

Reason *:

Consent *: ☐

You acknowledge that this feature enables modification of results actually reported by the Catchpoint service. You agree that you will use the feature solely to adjust for reporting results caused by incidental issues not actually related to performance (including inadvertent log-in failures), and you will not present as the Catchpoint service's reporting any results modified from the results actually reported by the Catchpoint service without an explicit disclaimer that you modified such results. Catchpoint will not be subject to any liability whatsoever for your use of this feature or any reliance by you or third parties on the results of this feature.

User Sentiment

View User Sentiment data alongside Synthetic and RUM data in the same Dashboard. Allowing an instant visibility on situations where an application may show as being down in Synthetic tests, but also seeing if more actual real users around the globe are complaining on Social Media at the same time.

Also, gage how User Sentiment of own brand is being influenced by performance, and also how it can affect revenue and conversions

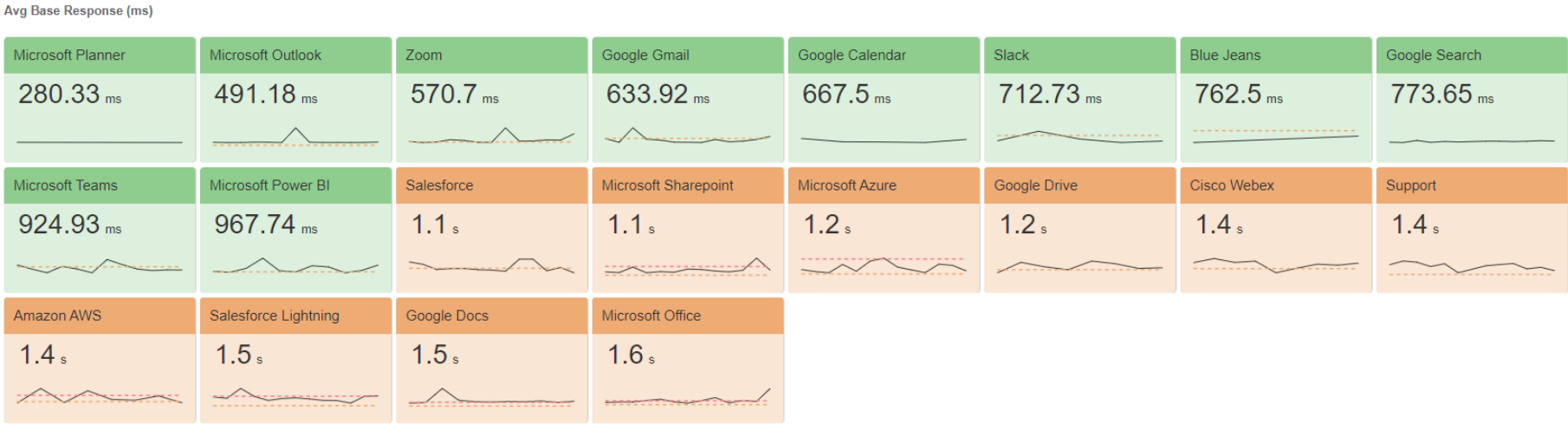
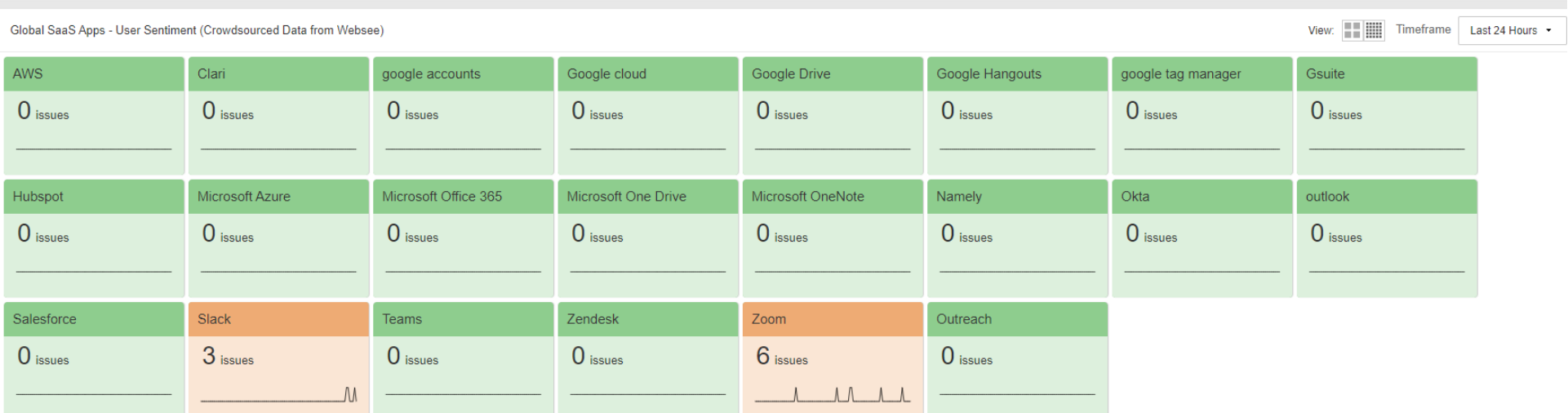


Chart shows Performance of SaaS applications on the top, with User Sentiment below - the figure reflects number of issues reported over the given period



Multiple APIs & Integrations – DevOps, SRE, CI/CD Friendly

Catchpoint APIs

- Real Time Data Push
- Alerts API Webhooks
- Events API
- Instant Testing API
- Rest API



Use Cases

- Real-Time Consumption
- Integrate, Escalate, Collaborate
- Add Context, CI/CD
- Query, CI/CD
- Provision, Query, CI/CD

Advanced Alerting Options

- Multi Triggers
- Trailing Values & Percentiles
- Trendshift - Algorithms
- Multi Threshold and Time Windows
- Customizable with Templates and APIs
- Integrate with tools like PagerDuty, ServiceNow, etc
- Alerts Simulation

Alert Type	Trigger	Node Threshold	Time Threshold
Synthetic Alert Types <ul style="list-style-type: none">Timing<ul style="list-style-type: none">Document CompleteRedirectTest Time with SuspectTest TimeResponseDNSConnectSend	<input type="radio"/> Specific Value <input checked="" type="radio"/> Trailing Value Compare : 85 Percentile (85th) Warning if : <input type="text"/> % > <input type="text"/> 5 Min (85th) Critical if : <input type="text"/> % > 5 Min (85th) <input type="checkbox"/> Utilize per node historical data. <input type="radio"/> Trend Shift	Runs <input type="text"/> If # <input type="text"/> Or <input type="text"/> % <input type="checkbox"/> Consecutive	Default <ul style="list-style-type: none">5 Min10 Min15 Min30 Min1 Hour2 Hours6 Hours12 Hours <input checked="" type="radio"/> Schedule <input type="radio"/> Rolling-window
Notify : <input checked="" type="radio"/> Default Recipients <input type="radio"/> Default and Additional Recipients <input type="radio"/> Additional Recipients Only <input type="radio"/> Do not notify, log only			
Warning Reminder : <input type="text"/> None Critical Reminder : <input type="text"/> 10 Min <input type="checkbox"/> Omit Scatterplot Image			
Instructions : <input checked="" type="radio"/> None <input type="radio"/> Custom <input type="radio"/> Template <input type="text"/> Select Template			

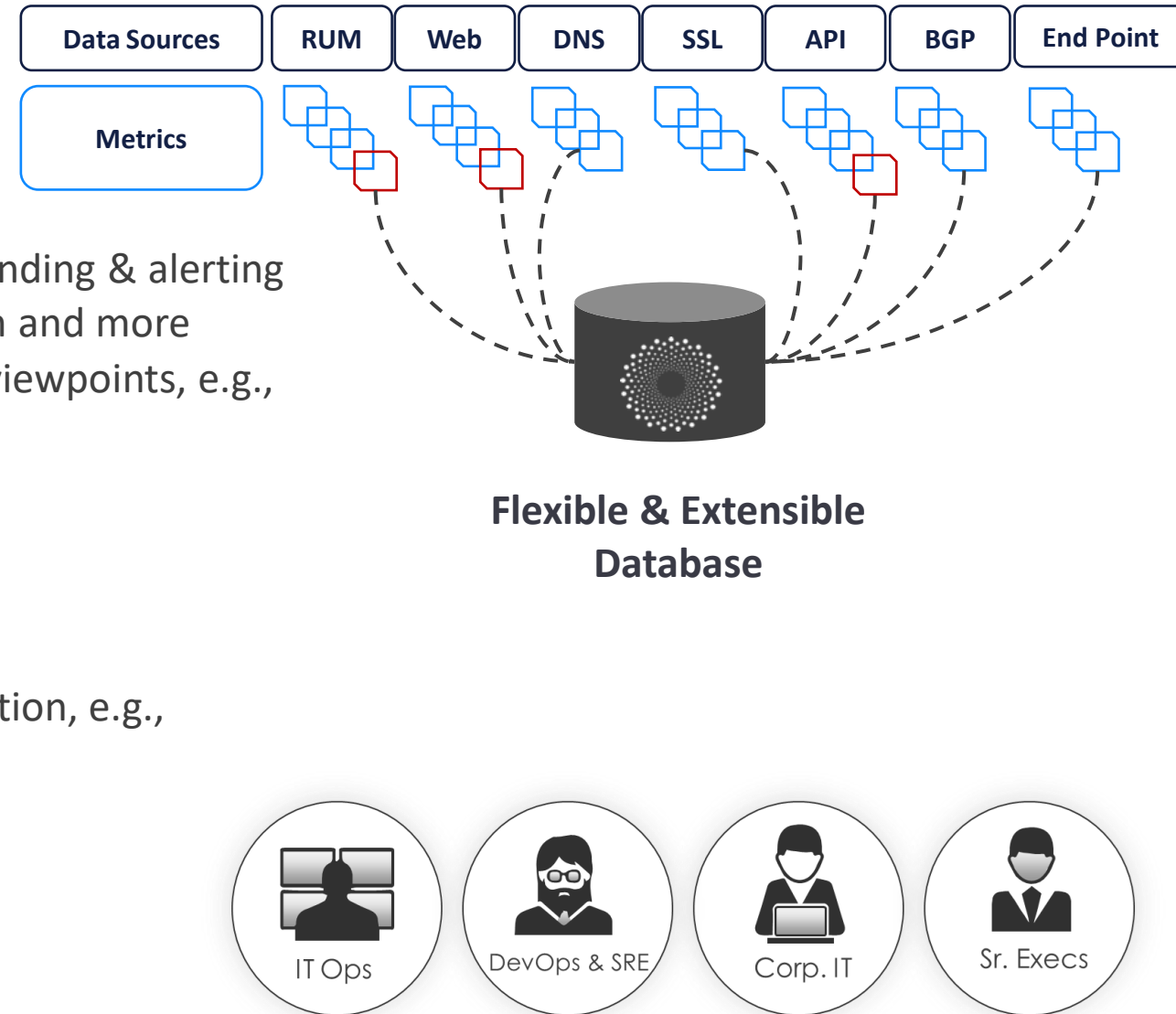
```
GET /smartphone/ HTTP/1.1
Accept: */*
Accept-Language: en-us
Accept-Encoding: gzip, deflate
User-Agent: Mozilla/4.0 (compatible; Catchpoint)
Host: www.priceline.com
Connection: Keep-Alive
```

Response Headers

```
Age: 0
Age: 0
Location: https://www.priceline.com?smartphone
Server: BigIP
Fastly-Restarts: 1
X-Served-By: cache-iad2124-IAD, cache-ewr18139-EWR
X-Cache: MISS, MISS
X-Cache-Hits: 0, 0
X-Timer: S1557014662.102150,VS0,VE33
WSHeader: (null) cdn=EWR/IAD
```

Richest Data, Multiple Uses

- Historical RAW data storage (up to 7 years)
- Extensive Analytics platform
- Large selection of default metrics
- Custom data/metrics captured and used for charting, trending & alerting
- Different statistical options like percentile, mean, median and more
- Multiple ways to analyze the data and chart from many viewpoints, e.g.,
 - Hosts
 - Zones
 - Requests
 - Each page
 - Complete performance
- Same data set & metrics can be used across the organization, e.g.,
 - IT Ops
 - App owners
 - Developers / SREs
 - Senior management



Your Private Enterprise Node

Deploy an Enterprise Node in your:

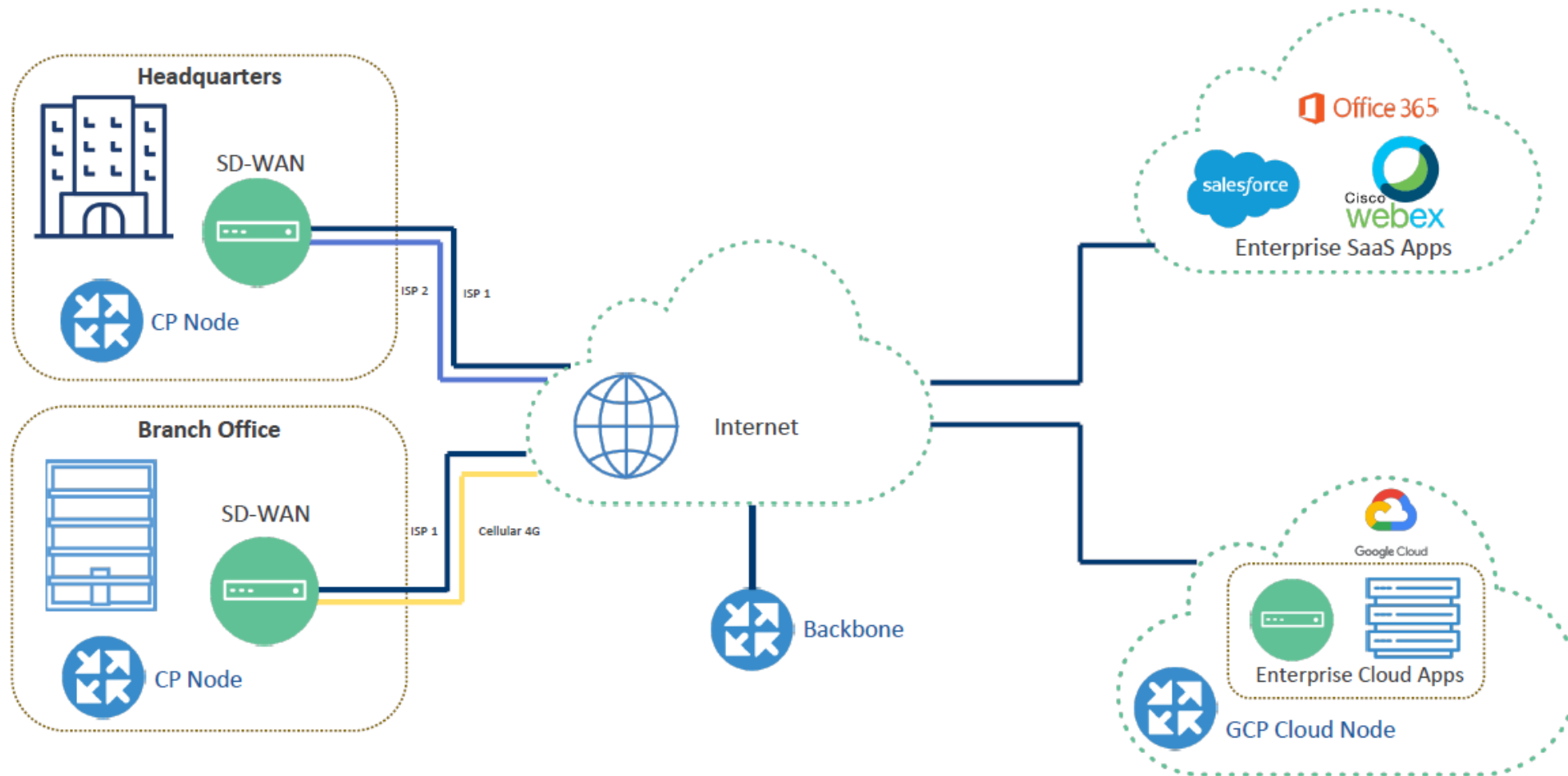
- Customer Site, Datacenter or Private Cloud; for Dev/QA environment.

Dedicated Catchpoint Node

- Runs within your private infrastructure
- Deployed on physical or virtual servers
 - Mini Computer
 - Server
 - Virtual server
 - Container/Docker
- Available in Windows or Linux Versions (RPM)
- Configured to meet your needs and use cases



SDWAN Deployment example



Catchpoint Mobile App for iOS and Android

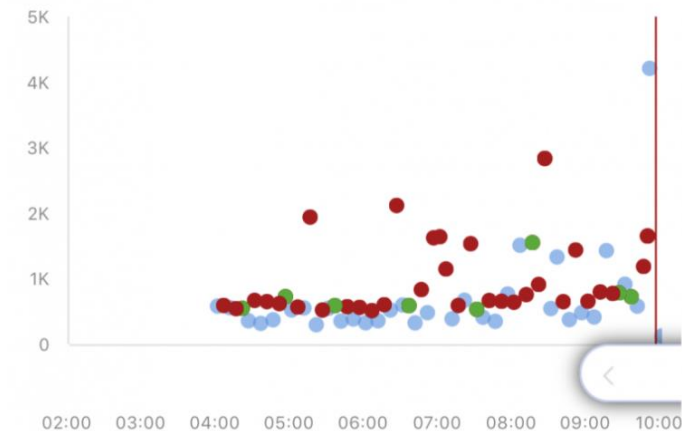
View Dashboards and also received real time PUSH alerts directly to your phone and smart watch



Timing: Response

Emulated :: Wikipedia Large Image (ID:304428)

START	CURRENT	DURATION
07:34 06/29	Ongoing 07/10	7 min(s)



Downtime detected from London, UK - NTT

07/09 14:15-07/09 14:30 15 min(s)

Execute Instant Tests for pre-deployment testing and troubleshooting

100 FREE a day

Run ANY test type, from ANY location.

Share the result via a public URL link

Can be executed via API for Automation purposes

The screenshot displays the 'Instant Test : Catchpoint' web interface in Google Chrome. The browser address bar shows the URL `portal.catchpoint.com/ui/Content/Charts/InstantTestDetail.aspx`. The page has a blue header with 'Instant Tests' and 'New Test' links. A 'GO' button is located on the left. The main configuration area includes a 'Type *:' dropdown set to '+ Web', a 'Monitor *:' search bar, and a '+ Test' button. Below these are fields for 'URL *:', 'Nodes *:', 'Capture:', 'Request Type *:', and 'Additional Settings:'. A list of test types is visible, including Web, Transaction, HTML Code, API, WebSocket, Streaming, DNS, FTP, Transport, and SMTP. On the right, there are radio buttons for 'Stable (75)' and 'Mobile', and a 'Filmstrip every:' dropdown set to '200 ms'. At the bottom, there are expandable sections for 'Request' and 'Insight'.

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Additional capabilities

Insights – Capture additional information (data strings or metrics) for charting, trending, alerting and diagnosis.

For example: Server name, CDN Pop, CDN Cache Hit/Miss, Browser timing metrics and anything else

Single Sign-On Integrations

Custom User Role definition

Automated Reporting

Targeting and Scheduling – select any nodes, monitor from all within a set frequency, or round robin.

Customized Flexible Dashboarding with sharing capabilities of any dashboard/chart/waterfall created

Labels for better test organization.

Free 24/7 Real-time Award-winning Service & Support

