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Extending end-to-end visibility deep into public cloud environments, using ThousandEyes

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BRKAPP-2161

Cisco Webex App

Questions?

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How

- 1 Find this session in the Cisco Live Mobile App
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- 4 Enter messages/questions in the Webex space

Webex spaces will be moderated by the speaker until November 15, 2024.

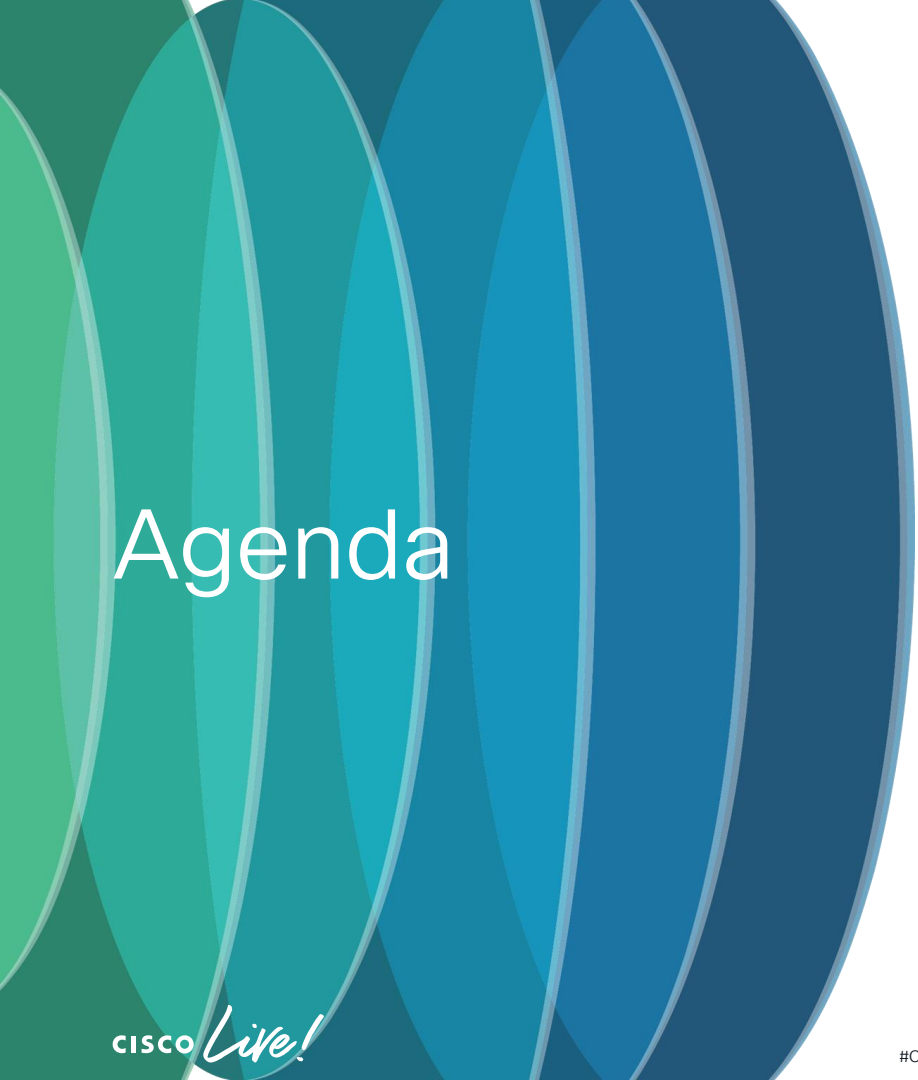


Who is Mike Hicks?



- Over 30 years of experience in network and application performance.
- Worked with infrastructure vendors on application profiling and management.
- Author of "Managing Distributed Applications: Troubleshooting in a Heterogeneous Environment" (Prentice Hall 2000) and "Optimising Applications on Cisco Networks" (Cisco Press 2004).





Agenda

- How traffic moves across the network
- Challenges
- Unpacking the Cloud
- Bridging the Gap
- End-to-End
- Applying the insights
- Summary

Steps for filling in session IDs

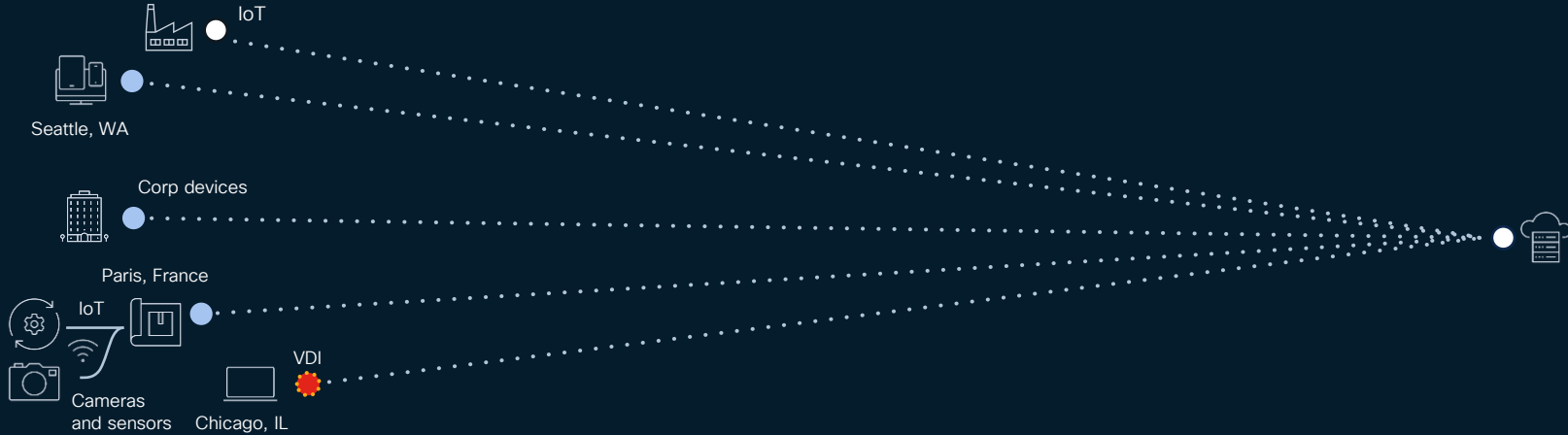
- Once you have entered your Session ID on the Title Slide:
 - Copy the Session ID
 - Insert / Header & Footer / Paste the Session ID into the Footer box
 - Ensure Slide number and Footer checkboxes are marked
 - Click “Apply to All”

How traffic moves across the network

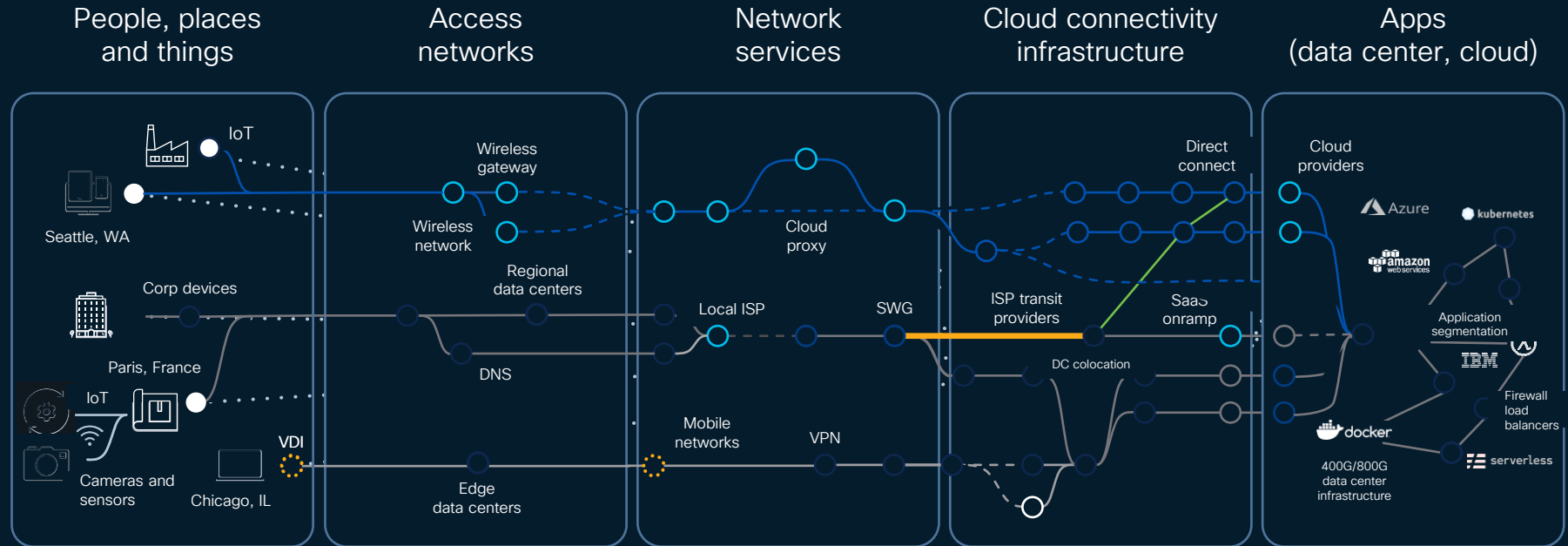
There and back again: How traffic moves across the Internet

- Collection of interconnected, autonomous networks
- No governing body on how networks interconnect and exchange traffic
- Peering and transit/customer relationships
- Dynamic nature of the “Internet”

The experience you want



But the reality is...



Challenges



Unavoidable **scale** **and complexity** of today's service delivery

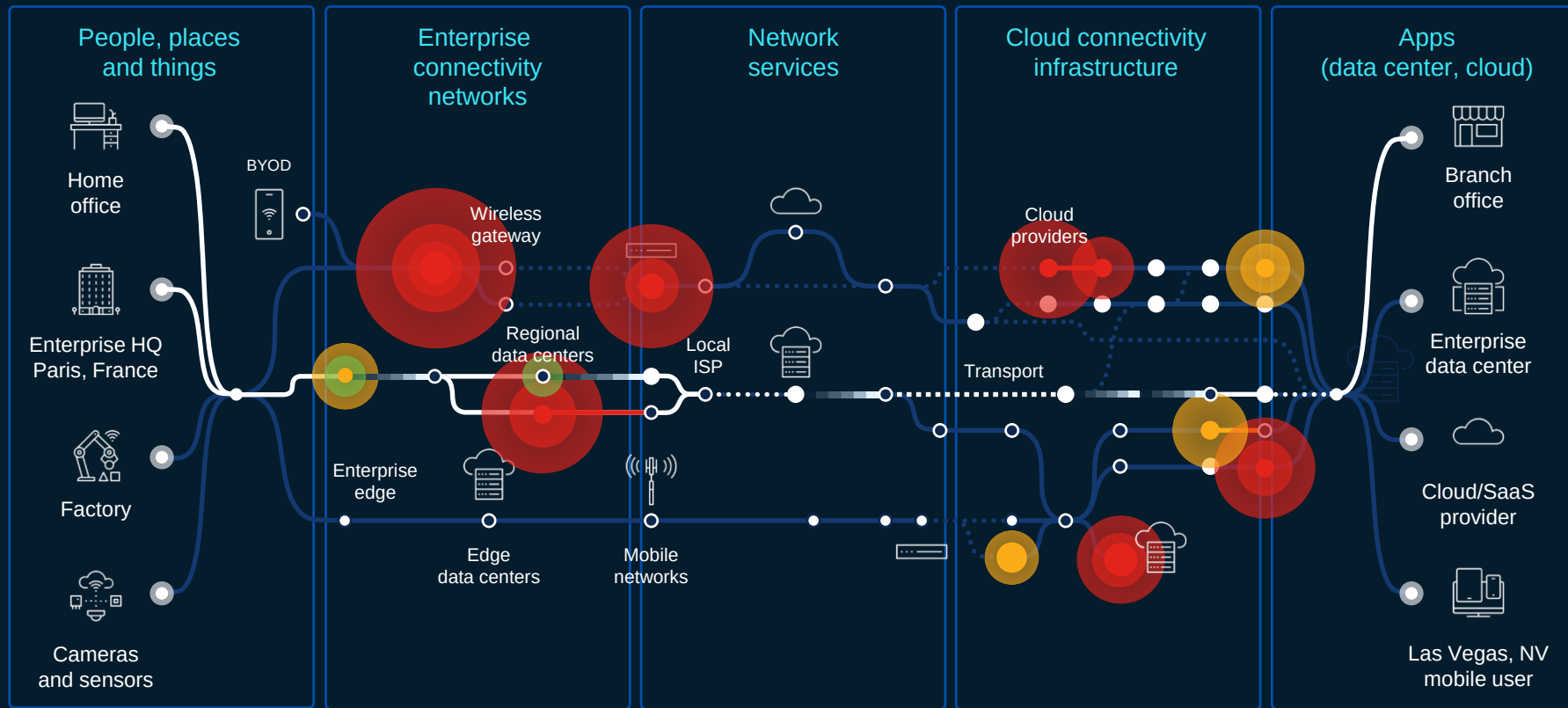
Digital experience is not monolithic

You don't own (by design) most dependencies

Fixing what you own isn't good enough

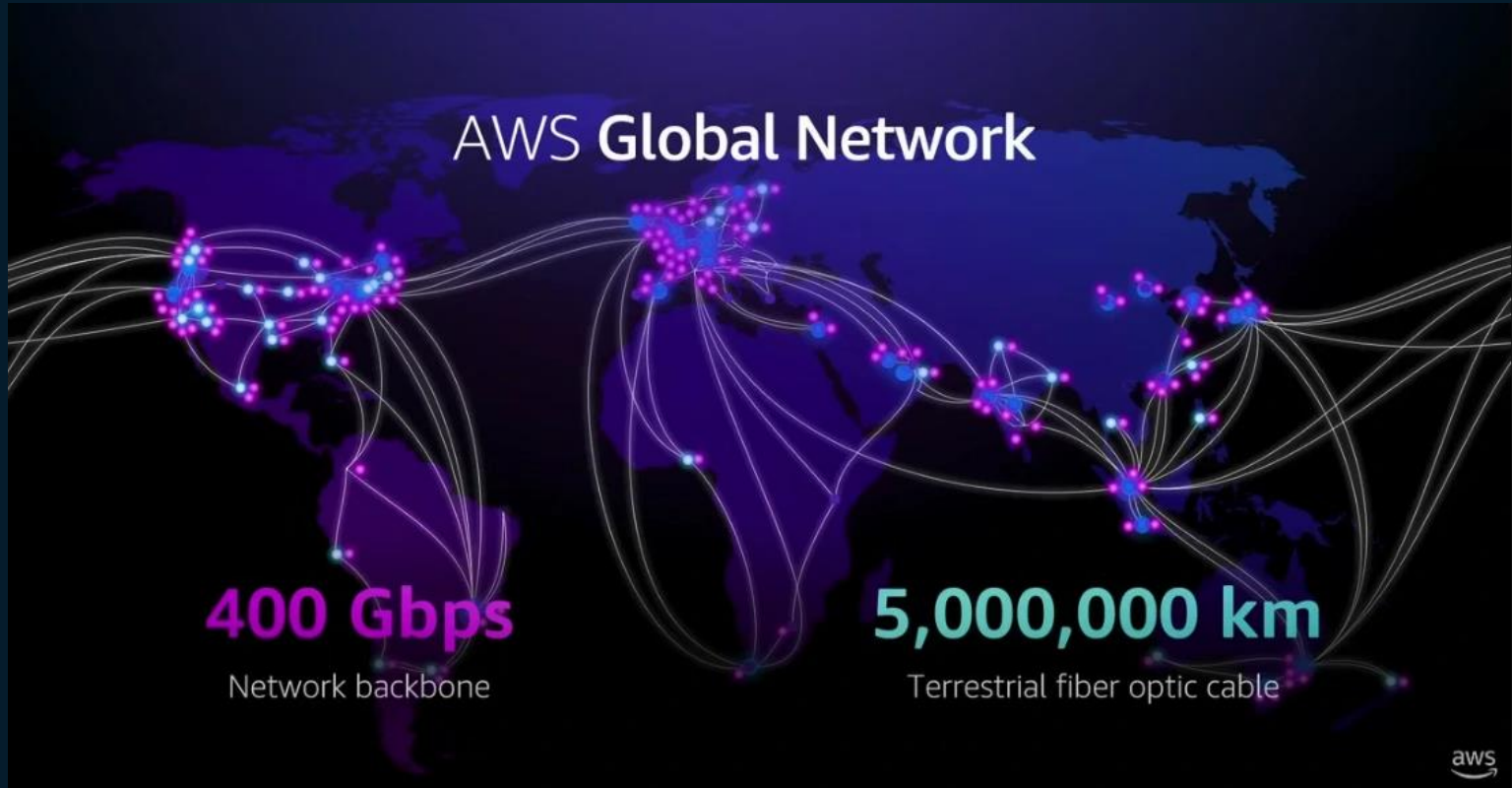


What is the worst that could happen?



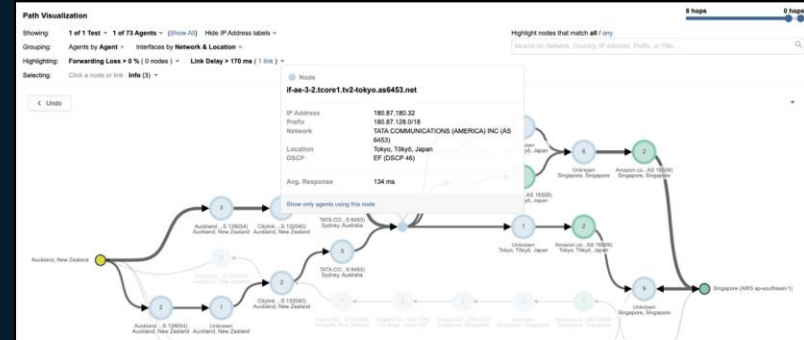
Unpacking the Cloud

Hyperscale deployments

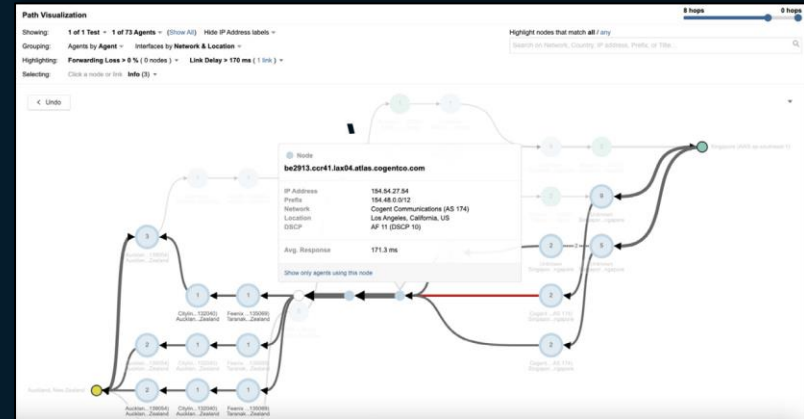


So, all network paths are created equal?

- How do cloud providers connect to the public Internet
- How and where do cloud providers connect to one another
- Regional differences among providers



External route advertisements create unwanted latency

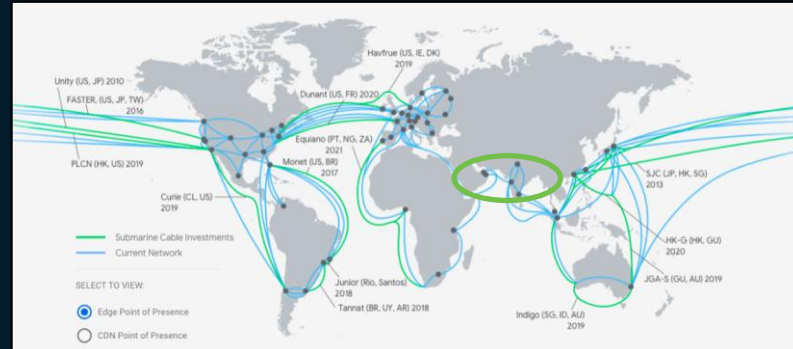


Where do I need service?

- Optimising application performance in cloud environments
- Reliability and performance in specific cloud regions
- Conditions will change over time



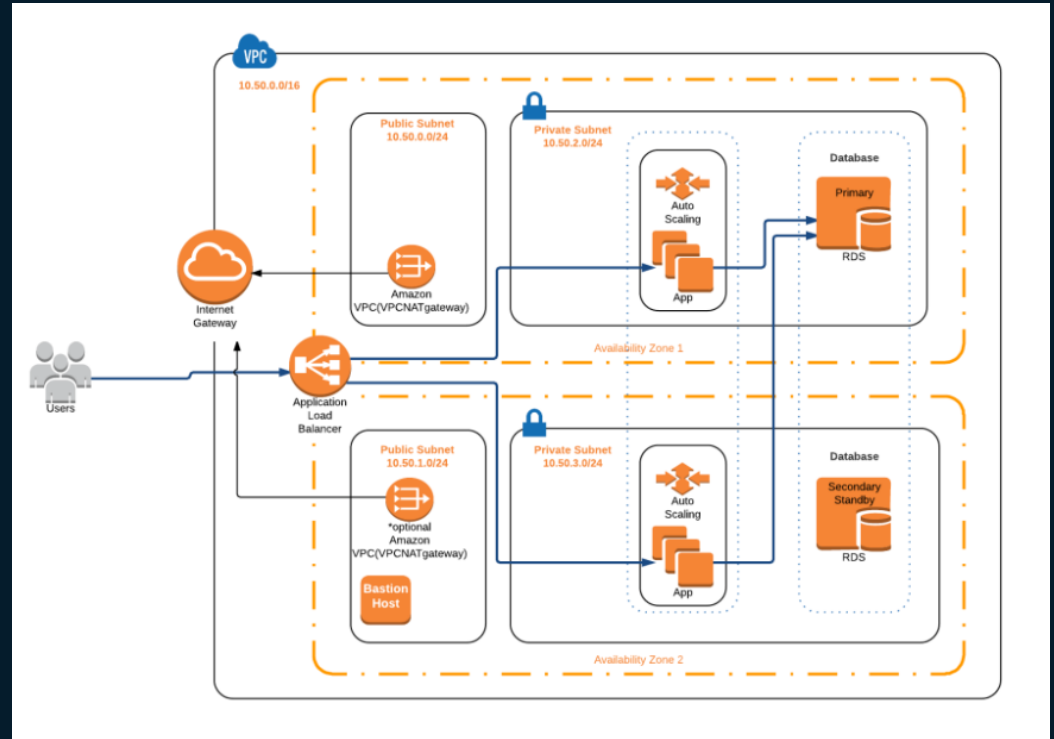
GCP backbone lacked direct connectivity between Europe and SE Asia in 2018



Reduced latency by approximately 100ms between Europe and Mumbai by May 2020

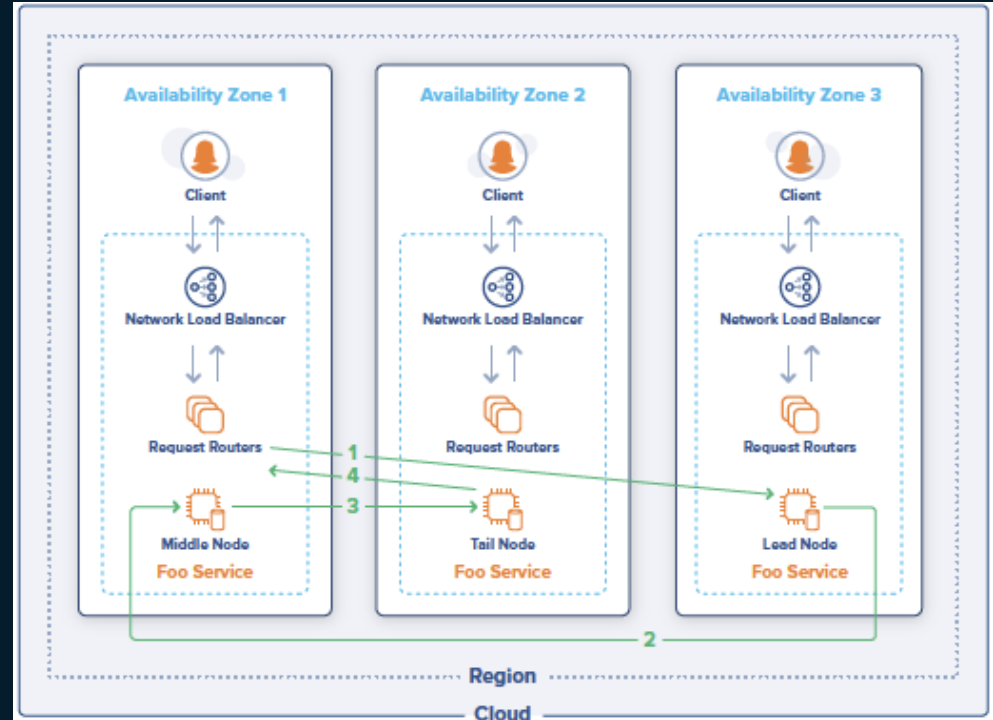
That is just to get to the Cloud

- Network Cloud
- Multiple components and services
- Distributed architecture
- Obfuscated path



Architected for resilience

- Architecting cloud apps to optimise both resiliency and performance
- Variabilities in performance between AZs operated by different providers
- Tolerance levels in frequency and duration of outages

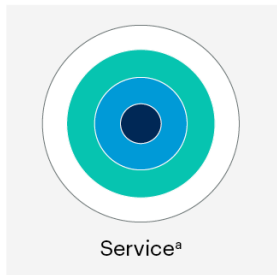
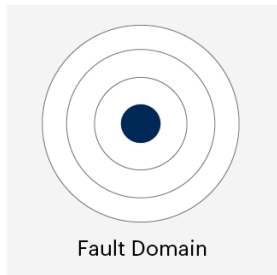
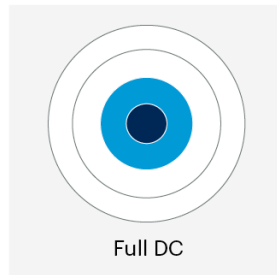
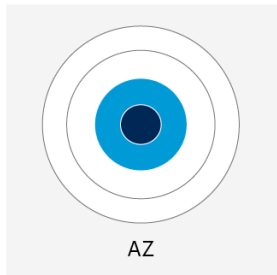
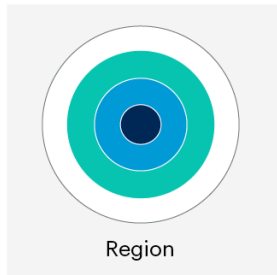


Multiple points of potential failure

Plan for These Types of Cloud Provider Failures

Concentric Circles Represent “Blast Radius” Scope:

● Fault Domain ● AZ ● Region ● Multiple Region



Source: Gartner

^a In a “Service” failure, the impact is single-service. In all other failures, the impact may be multiservice.

758522_C

Many silo views

No recent issues

Updated less than 1 minute ago

Service history

The following table is a running log of AWS service interruptions for the past 12 months. Choose a status icon to see status updates for that service. All dates and times are reported in Pacific. To update your time zone, see [Time zone settings](#).

Find an AWS service or region

2024/10/03

North America

South America

Europe

Africa

Asia Pacific

Middle East

All locales

< 1 2 3 4 5

Service	RSS	Today	2 Oct	1 Oct	30 Sep	29 Sep	28 Sep
Amazon API Gateway (Bahrain)							
Amazon API Gateway (Calgary)							
Amazon API Gateway (Canada-Central)							
Amazon API Gateway (Cape Town)							
Amazon API Gateway (Frankfurt)							
Amazon API Gateway (Hong Kong)							
Amazon API Gateway (Hyderabad)							
Amazon API Gateway (Ireland)							
Amazon API Gateway (Jakarta)							
Amazon API Gateway (London)							
Amazon API Gateway (Malaysia)							

Overview

Americas (regions)

Europe (regions)

Asia Pacific (regions)

Middle East (regions)

Africa (regions)

Multi-regions

Check status by product and location. Click the other tabs to check the status for specific regions and multi-regions.

Multi-regions: Services in a multi-region location are managed by Google to be redundant and distributed across multiple regions in a large geographic area. [Learn more](#).

Global: status for a specific globally distributed service offered to the product. This status does not refer to all product service around the world, just the specific global service.

Available

Service information

One or more regions affected

Products	Americas (regions)	Europe (regions)	Asia Pacific (regions)	Middle East (regions)	Africa (regions)	Multi-regions	Global
Batch							
BeyondCorp Enterprise							
BigQuery Data Transfer Service							
Binary Authorization							
Certificate Authority Service							
Chronicle Security							
Chronicle SOAR							
Cloud Armor							
Cloud Asset Inventory							
Cloud Billing							
Cloud Build							
Cloud CDN							
Cloud Data Fusion							
Cloud Data Loss Prevention							

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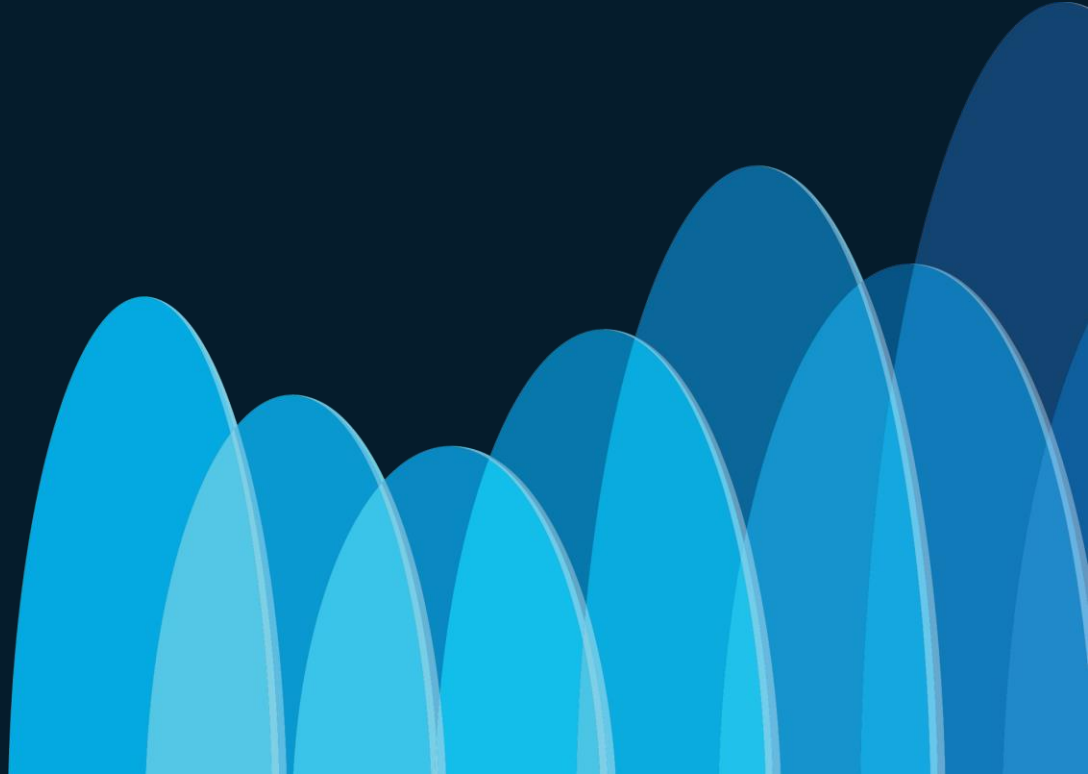
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Bridging the gap



Cloud Native Monitoring for Cloud

Path enrichment

- IP-address enrichment for cloud-based targets by identifying AWS services, and AWS region, as well as providing the expected TCP latency to AWS Global Accelerator
- Released in October 2023

AWS test recommendation of Cloud Front and Global Accelerator

- Using the same AWS integration for API Gateway, discover the hosted public service endpoints, “Cloud Front and Global Accelerator and generate the recommendations
- Released on April 2024

AWS test recommendation of API Gateway

- By connecting to your AWS account, auto-discover your critical API endpoints and generate the appropriate test recommendations for monitoring the API Gateway
- Released in Jan 2024

Cloud Insights with AWS

- Through another AWS integration, gain insight into their AWS inventory, topology, and traffic flow to enable them troubleshoot and take actions based on these insights
- Limited Preview in Sep 2024

Network Path Enrichment

- ThousandEyes Path Visualisation gives you a hop-by-hop view of network traffic
- The enrichments to the path visualisation leverage new AWS data sources to:
 - Improve the identification of IP addresses across the global AWS network
 - Notify when observed TCP latency across the AWS global accelerator network rises above expected levels
 - Provide enrichment for AWS nodes within the network path visualisation to help easily identify services like S3, EC2, CloudFront, Route 53, and AGA
 - Enable more accurate Internet outage detections across AWS edge and backbone networks
 - Display the AWS Region and network associated with user traffic and cloud services
- Relationship between AWS and ThousandEyes provides enriched network metrics and actionable intelligence to facilitate faster issue resolution and increased visibility into cloud-based traffic.
- Detailed diagnostic data collected by ThousandEyes can be shared with Support for troubleshooting

 Amazon AWS Cloud Front server-99-84-208-127.iad79.r.cloudfront.net	
IP Address	99.84.208.127
Prefix	99.84.0.0/16
Network	Amazon.com, Inc. (AS 16509)
Location	Washington D.C., District of Columbia, US
Service	Amazon CloudFront
Region	GLOBAL
Network Border Group	GLOBAL
Avg. Response	90 ms

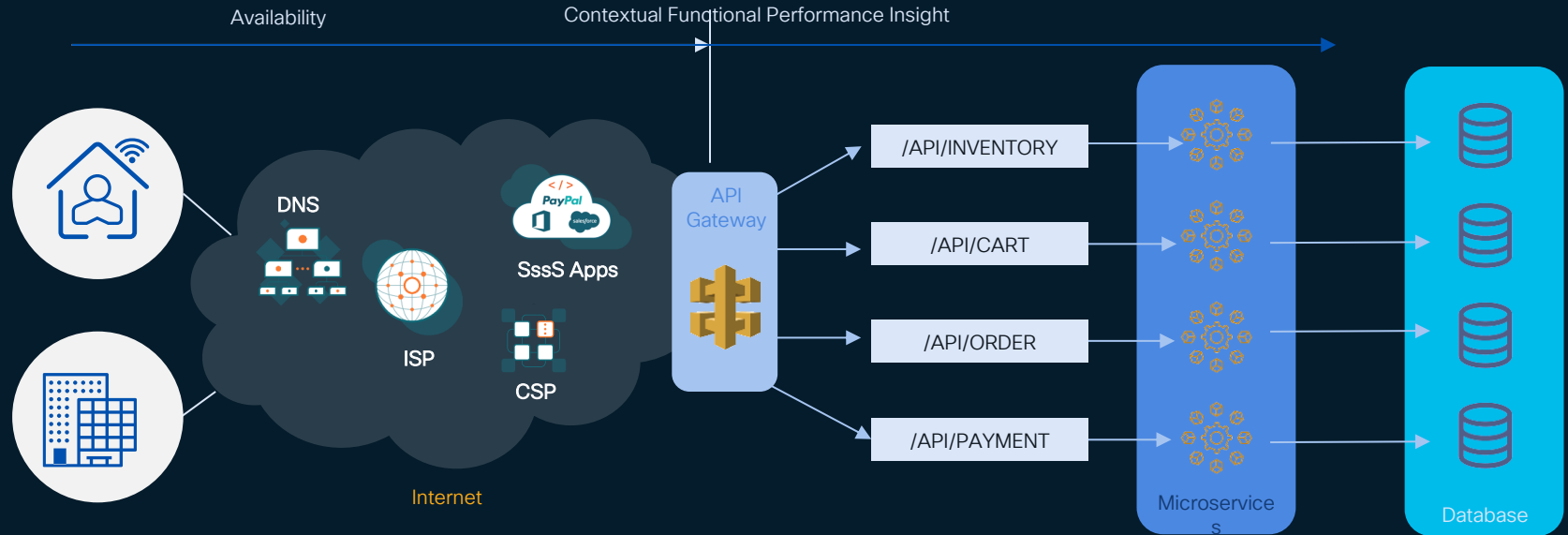
 AWS Route 53 Node ab43338cb7f67e12e.awsroute53.com	
IP Address	76.233.82.139
Prefix	99.83.71.0/21
Location	Johannesburg, South Africa
Network	Amazon AWS (AS 16509)
Avg Response	2 ms
Show Only Agents Using This Node	

 Amazon AWS Elastic Compute Cloud ec2-34-234-60-43.compute-1.amazonaws.com	
IP Address	34.234.60.43
Prefix	34.224.0.0/12
Network	Amazon.com, Inc. (AS 16509)
Location	Ashburn, Virginia, US
Service	Amazon Elastic Compute Cloud (EC2)
Region	us-east-1
Network Border Group	us-east-1
Avg. Response	229 ms

Agents with higher than expected response time	
 Amazon AWS Global Accelerator ab42238cb7f67e12e.awsglobalaccelerator.com	
IP Address	13.248.203.51
Prefix	13.248.128.0/17
Network	Amazon.com, Inc. (AS 16509)
Location	US
Service	Globalaccelerator
Region	GLOBAL
Network Border Group	GLOBAL
Avg. Response	⚠ 160 ms (Expected: 3 ms)
Agents with High Response Times vs Expected From Closest POPs	
Singapore	
POP 1 Singapore, Singapore (SIN2-1)	⚠ 160 ms
POP 2 Singapore, Singapore (SIN52-2)	3 ms



The Journey of an API



Cloud Insights

Key Capabilities

Cloud Topology Visualisation

Auto discover cloud provider resources to understand every service dependency

Cloud Traffic Views

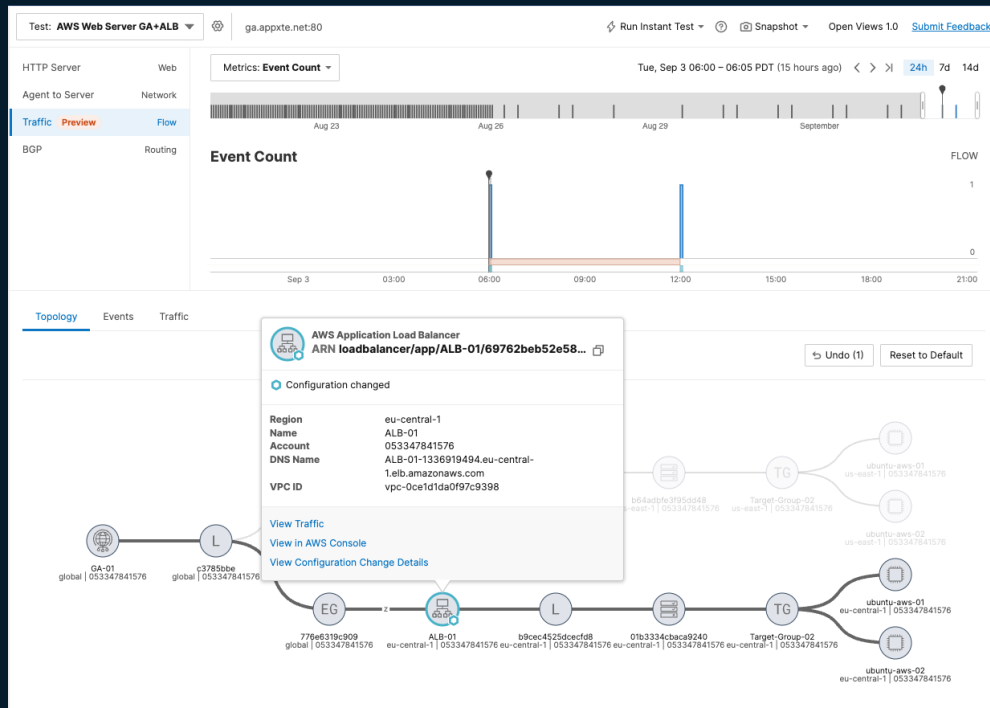
View traffic patterns so you can efficiently architect and troubleshoot your cloud network

Correlated Cloud Infrastructure Changes

Append config changes and events to time-correlated views of experience so you can isolate root-cause faster

Value

Deep visibility into public cloud infrastructure and service dependencies that impact digital experiences to dramatically reduce MTTR



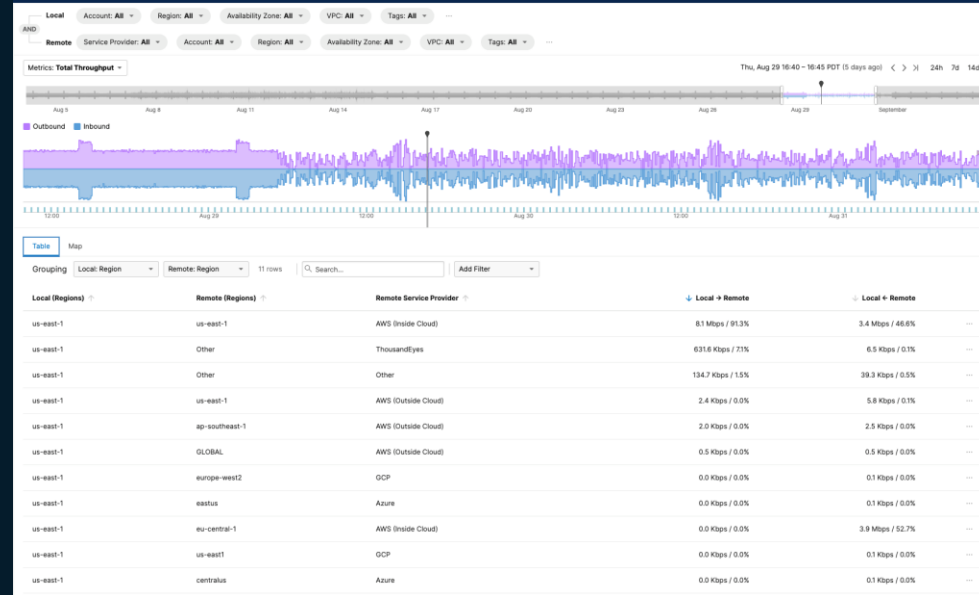
Cloud Insights with AWS

Traffic Flow Analysis

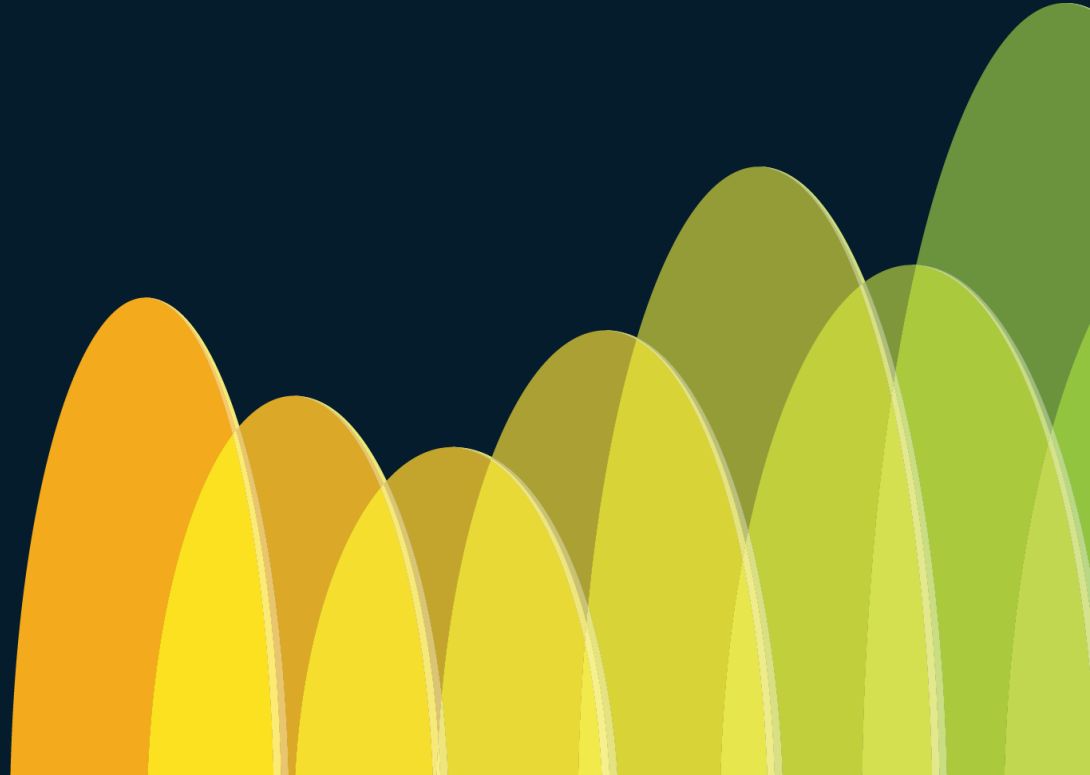
- Ingests VPC flow logs from AWS and displays traffic information in pre-built dashboards and views
- Traffic views can be filtered by several dimensions, such as by cloud account, region, availability zone, VPC, application, enabling flexible and contextual views of performance
- Events takes recent configuration changes and other events, time-correlating them with views of digital experience to provide necessary context for quickly isolate root causes.

Value

This visibility empowers CloudOps teams to identify and fix problems faster and gives them the information they need to architect cloud workloads more efficiently.



End-to-End

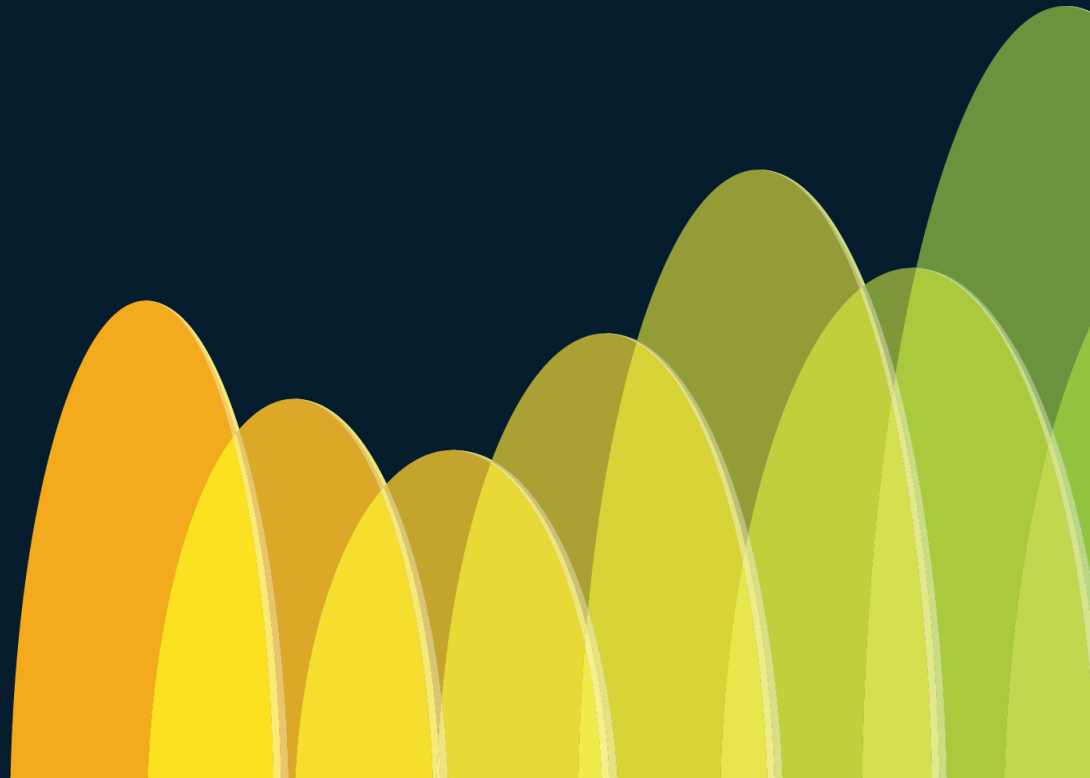


End-to-end **command** of service delivery



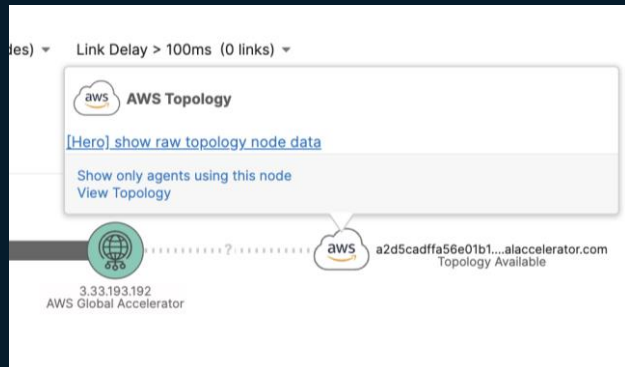
Performance is critical but it's not the only thing that matters...

Demo

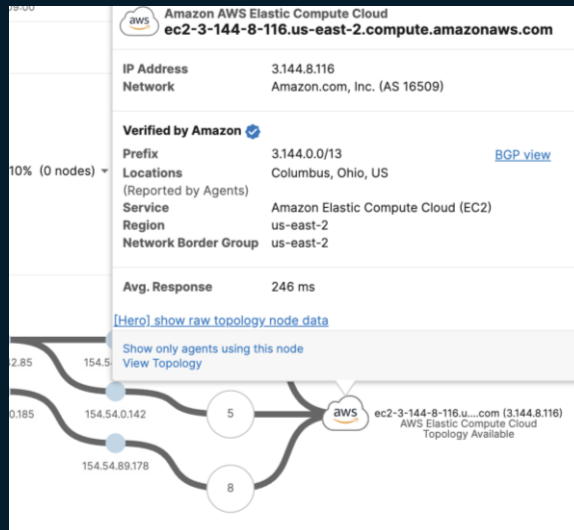


Demo

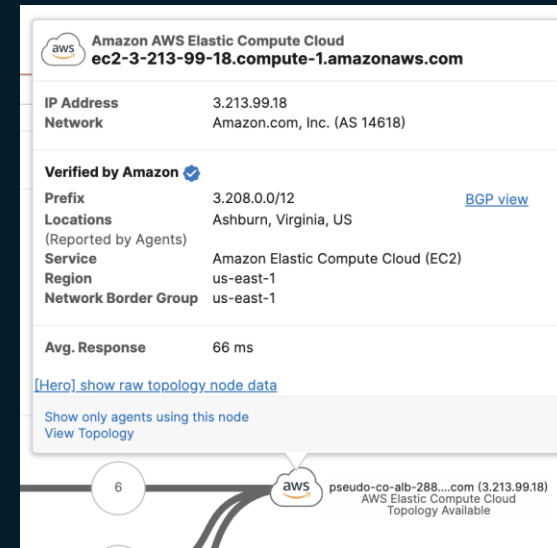
Global Accelerator



EC2 instance



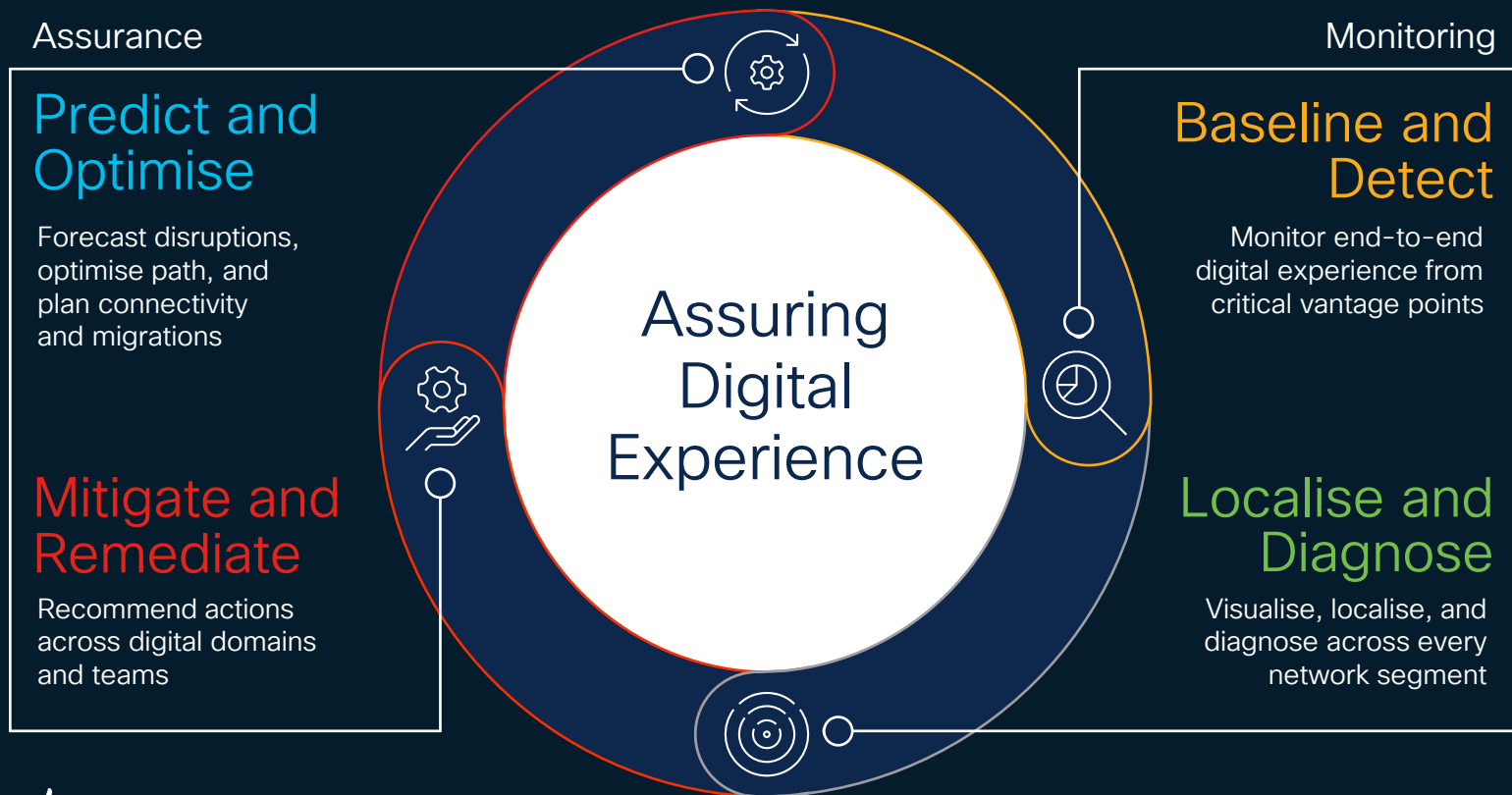
Load Balancer



Summary



Assuring Critical Digital Capabilities



Keynote Deep Dives

Wednesday
10:30am – 11:30am



Experiences Amplified:
How AI Can Fuel Better Employee and Customer Experiences

Level 1
Room 106



Smart, Secure, Seamless:
Transforming Experiences with Next-Generation Networking

Level 2
Room 204



Harness a Bold New Era:
Transform Data Centre and Service Provider Connectivity

Level 2
Room 203



Securing User to Application and Everything in Between

Level 2
Melbourne Room 2



Unlocking Digital Resilience through Unified Observability

The HUB
Centre Stage

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