Premier Gaming Experience

Enabling stc's digital customer experience assurance

Hatim Alshehri - Transport Network Manager, stc
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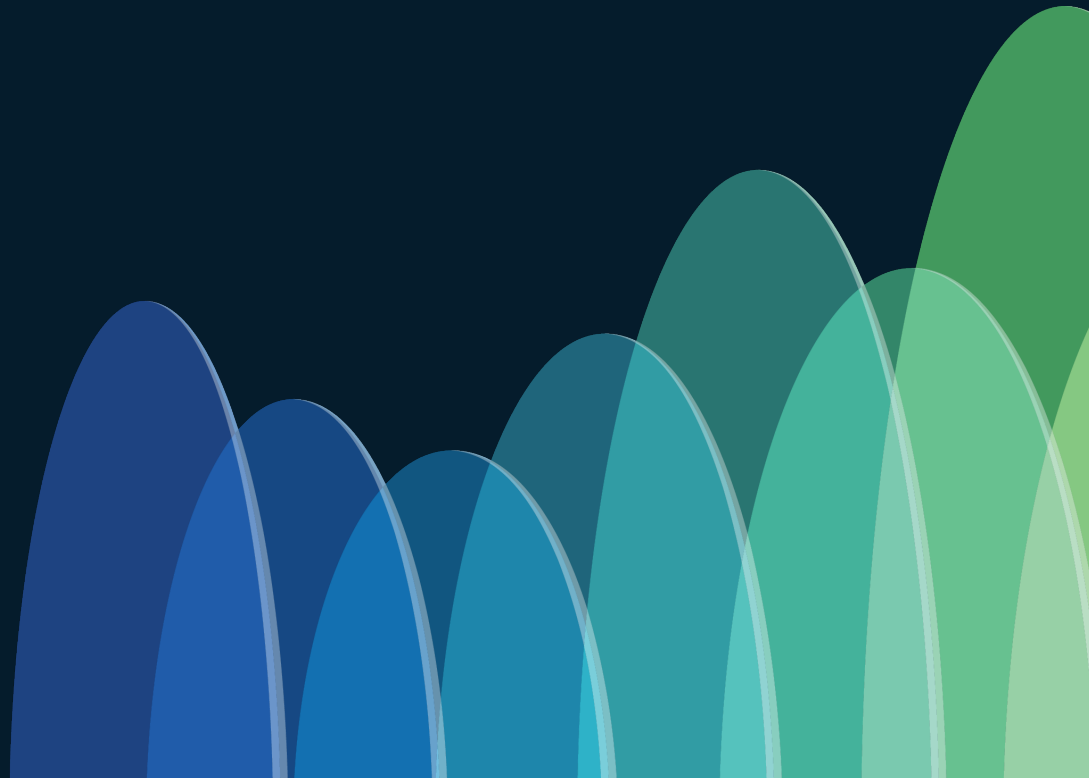
CSSSPG-2256

Agenda

- stc, elite connectivity provider for Esports World CUP 2024
  - About stc
  - Network evolution journey
  - Towards an Autonomous Network
  - Premier gaming experience
- Seamless connectivity & network resiliency
  - Transport network architecture
  - Automation Journey
  - Proactive service assurance
  - Looking into the future

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About stc

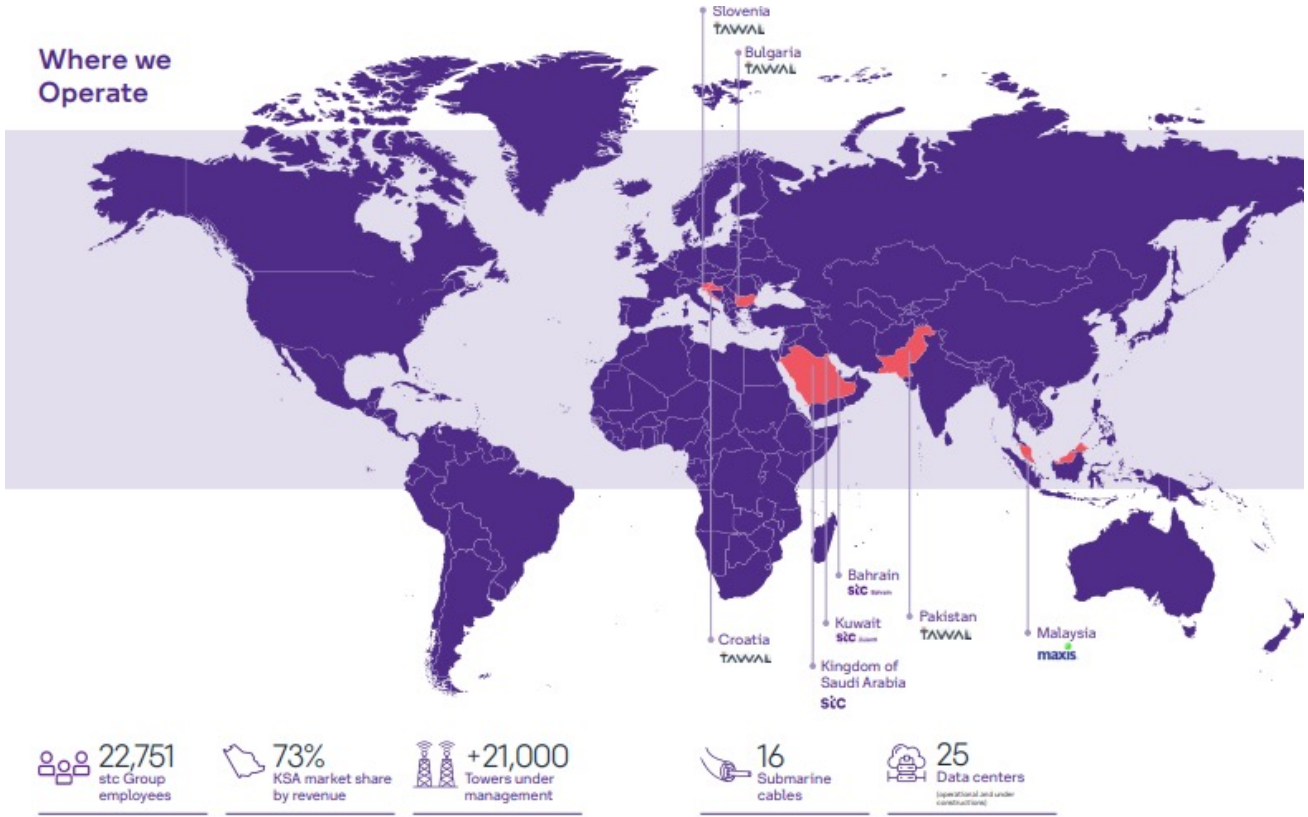


Premier Gaming Experience



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About stc



Vision

Digital and telco leader, enabling the society and economy to thrive, in KSA and beyond.

Key business activities

- **Leading the digital transformation nationally and regionally**
- **Offering variety of ICT solutions and digital services including:**
  - **Telecommunication**
  - **Financial technology**
  - **Digital media**
  - **Cybersecurity**
  - **and other advanced digital solutions.**

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stc empowers the Kingdom's digital transformation to become the premier global hub for gaming and esports

Kingdom Vision & Events

VISION رؤية 2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

NATIONAL GAMING & ESPORTS STRATEGY
استراتيجية قطاع الألعاب والرياضات الإلكترونية

RIYADH
KINGDOM OF SAUDI ARABIA
EXPO 2030

stc strategy

- **D** Digitize stc
- **A** Accelerate performance
- **R** Reinvent experiences
- **E** Expand scale and scope

Transport Network Focus

- Connectivity & Capacity Evolution
- Simplification
- Automation
- Network Autonomy
- AI based Analytics

Quicken & Modernize Infrastructure
Build world-class infrastructure that ensures the success of gaming and esports by stepping up of speed, capacity and coverage

Enhance Customer Experience
Ddigitally resilient networks and observability solutions to strengthen stc position as innovation leader

Aspire Efficiency Increase
Pursue efficiency of Business and Network Operation via Service fulfillment automation, proactive automated assurance, …

stc

stc network transformation was driven by the Rise of 5G and Evolving Customer Needs. stc is pursuing network advancement towards an AN (**Autonomous Network)** for Operation Efficiency and Improved customer experience

Transformation Journey

Elevate Infrastructure

- Consolidated architecture
- Platform Modernization
- Capacity Upgrade
- Network Resiliency
- Distributed DC

Stability, Capacity, Efficiency

Simplify & Abstract

- Protocol Simplification: SR,EVPN
- SDN & Orchestration
- Network/Service Latency Consideration
- E2E Automated Service Fulfillment
- Network Slicing

Scalability, NaaS

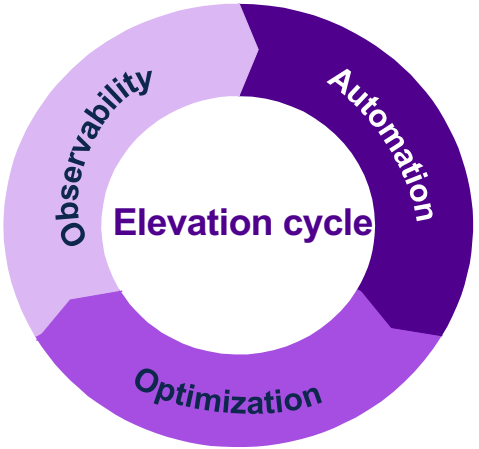
Data Intelligence with actionable insights

- Proactive Service Assurance
- Self-healing

Service Centric

AN : stc's new target

- ✓ Self-serving
- ✓ Self-fulfilling
- ✓ Self-assuring
- ✓ Zero-wait
- ✓ Zero-trouble
- ✓ Zero-touch



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stc

The transformation has empowered stc to significantly reduce Mean Time to Repair (MMTR), accelerate time-to-value, and enhance customer experience, among other benefits.

Values Realized

Use Case	Before	Now
E2E Network Discovery Visualization & performance	N/A	Real Time
Delay Enhancement & Low Latency Network Slice	N/A	1ms granularity
Disaster Recovery Automated Services restoration time(RTO)	hours	minutes
Local Congestion Mitigation	hours	minutes
Traffic Steering for Delay Sensitive Services	Manual	Automated
Path Control & Bandwidth on Demand (BWoD)	N/A	Network Monetization

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Riyadh 2024 Esports World Cup, a $ 60M awards & 1500 player event - Delivering seamless gaming experience through top-tier network resilience and assurance is a must.

Esports World CUP in numbers

- Biggest cross-game event ever
- $ 60M LIFE-CHANGING prize
- 1,500 world best esports players
- 25 online games
- 500 million viewers
- 250 million hours of content consumed





Transport Network Focus

- High- speed reliable connectivity
- Real-time service centric visibility
- Simplified service management & operations with advanced automation
- Digital experience across the e2e service delivery chain

Enhance Customer Experience with digitally resilient networks & observability solutions

stc  cisco

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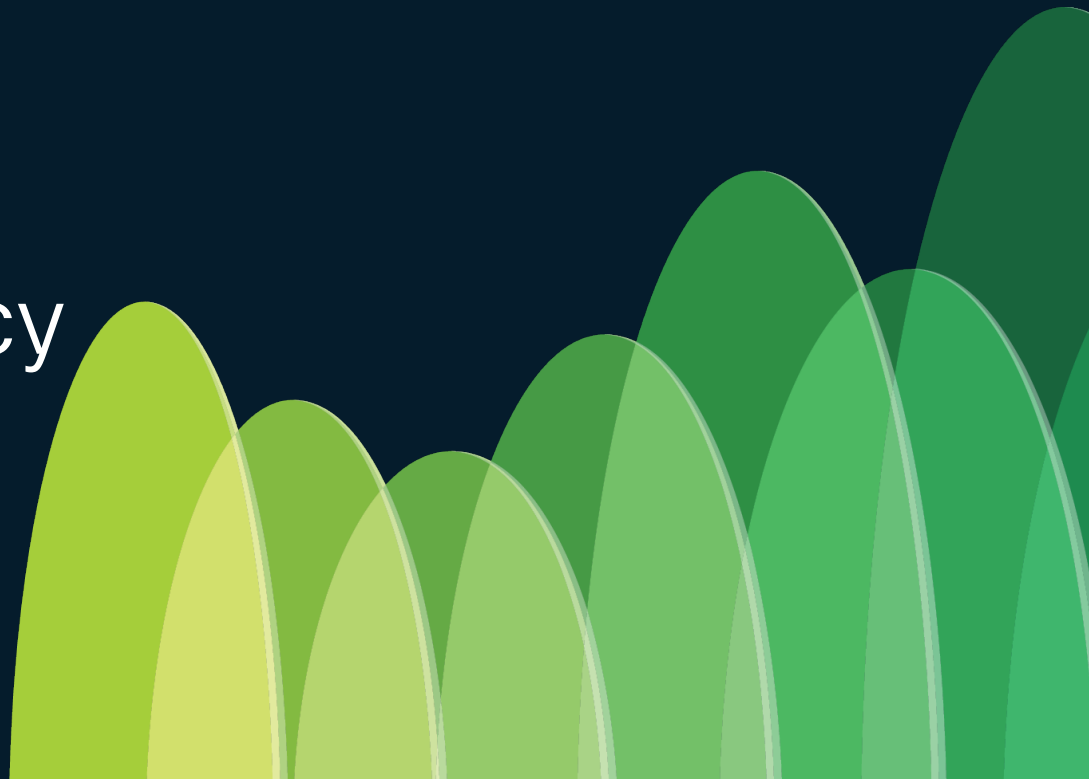
شُكراً

Thank You !

stc

Internal

Seamless connectivity & network resiliency



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ESPORTS WORLD CUP

stc as elite connectivity provider



25 online games





Live broadcasting

MBC ACTION

stc tv

stc play

Network Expectations

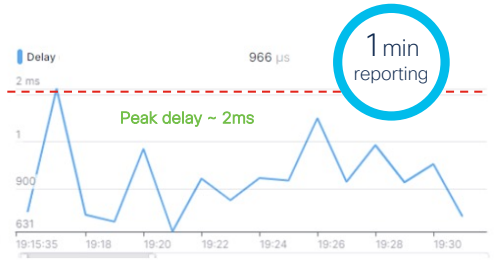
- Seamless gaming experience
- e2e resiliency, ensure no delay, lag or disconnection
- Proactive Operations and Analytics to Drive Closed-Loop Automation
- Granular visibility across owned & unowned networks
- Online games are hosted on distributed public cloud:
  - Frankfurt, Germany
  - Amsterdam, Netherlands
  - Dubai, UAE (Azure)
  - Doha, Qatar (GCP)
  - Manama, Bahrain (AWS)
  - Dammam, Saudi Arabia (GCP)

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Gamer's Experience is measured in milliseconds, not minutes

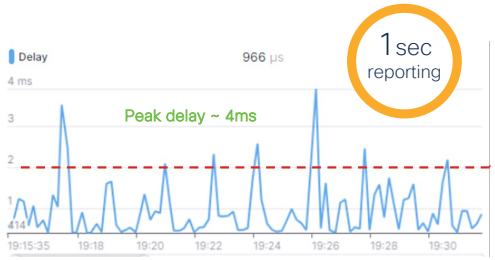
Perception x

Latency is below threshold
Service performing according to SLA/SLO



Reality ✓

Multiple latency threshold crossing alerts
Service affected by latency issues



Observations / Results:

- 0.53% Packet Loss → 50% decrease in Data throughput
- 5 msec Delay → 10% decrease in Data throughput
- 10 msec Jitter → 10% decrease in Data throughput

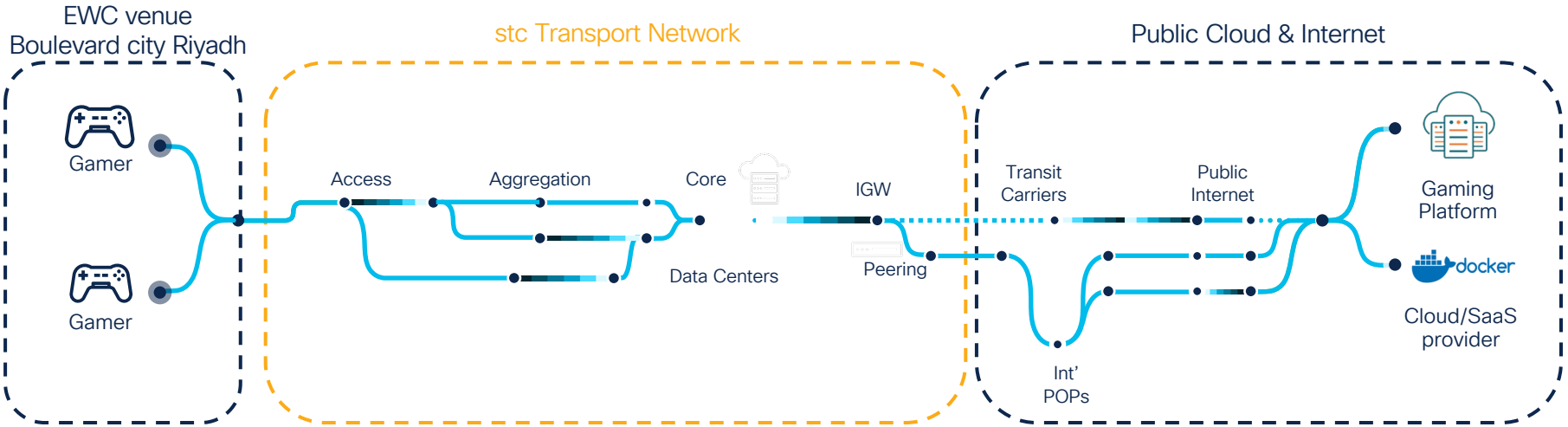
Conclusions:

- The quality of network has major influence on end user QoE
- Packet loss causes significant throughput reduction
- Delay and jitter seriously affect Data throughput

Slow is the new Down

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stc doesn't own the end-to-end network, *yet are responsible for the consumer QoE!*



When something goes wrong..

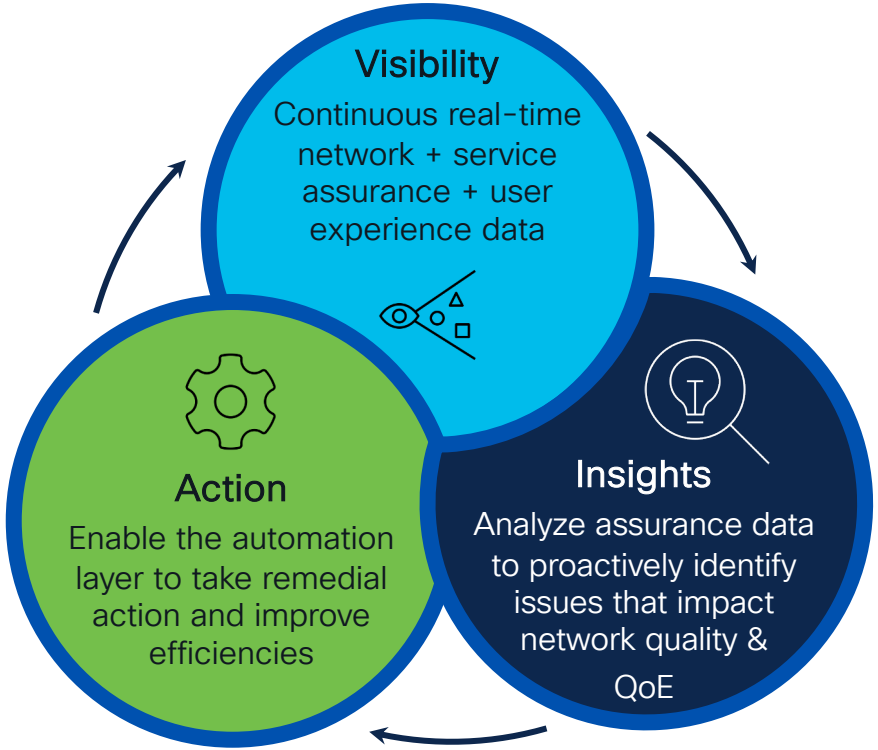
- Identify if it is inside stc's network or outside?
- Maintain high levels of end-to-end resiliency leveraging closed loop automation?
- Prevent disruption in the digital experience?

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Enabling Proactive Operations and Analytics to Drive Closed-Loop Automation

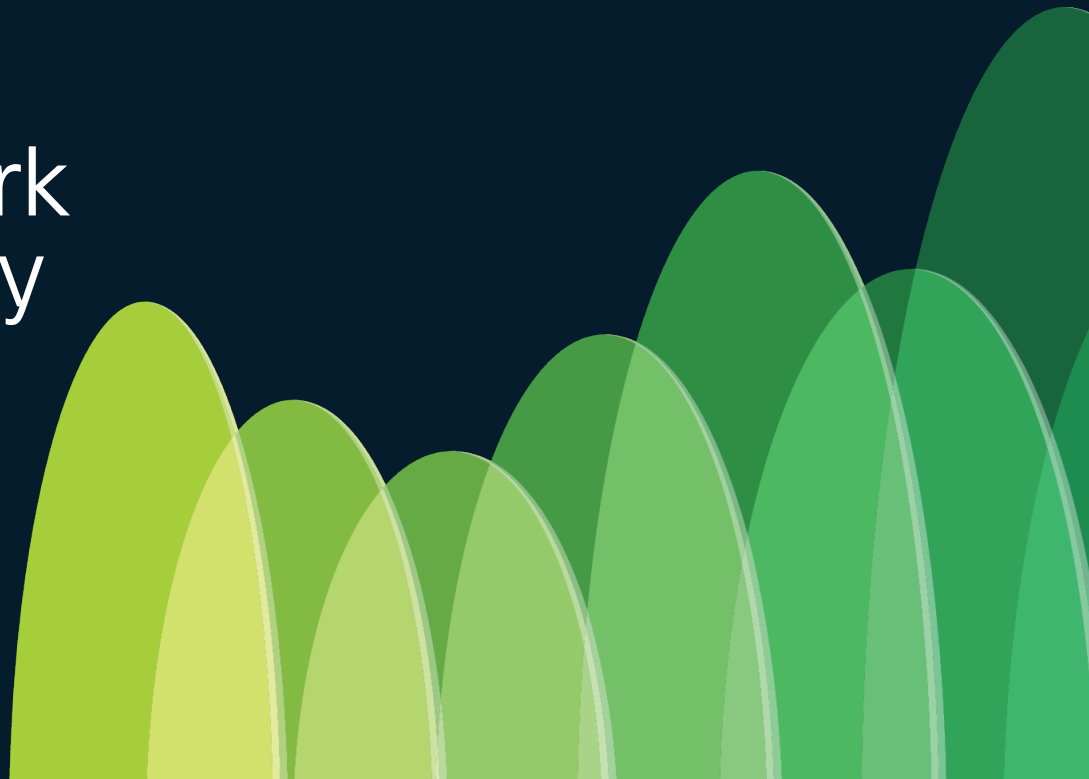
- Intent-based & zero-touch
- Avoid service disruptions and customer experience impact

Operating model



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Transport network evolution Journey

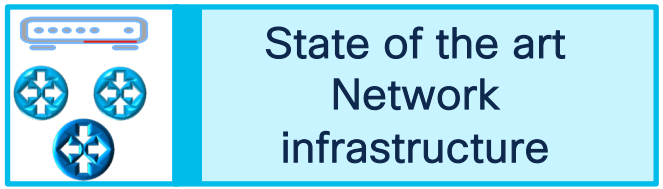


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Transformation Journey







CY2018 CY2022 CY2024

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Transformation Enablers

Cisco Crosswork Automation & Connectivity assurance

Network Visualization

Service fulfillment

Migration use cases

Workflows, Network Pre-Check



Congestion Mitigation

Planning, Failure Analysis

Low Delay Traffic Steering

Active service monitoring

Hardware and Software



ASR9K modernization

Cisco 8800 routers

SiliconOne IOS-XR

100G/400G Evolution

Network Readiness



Segment Routing

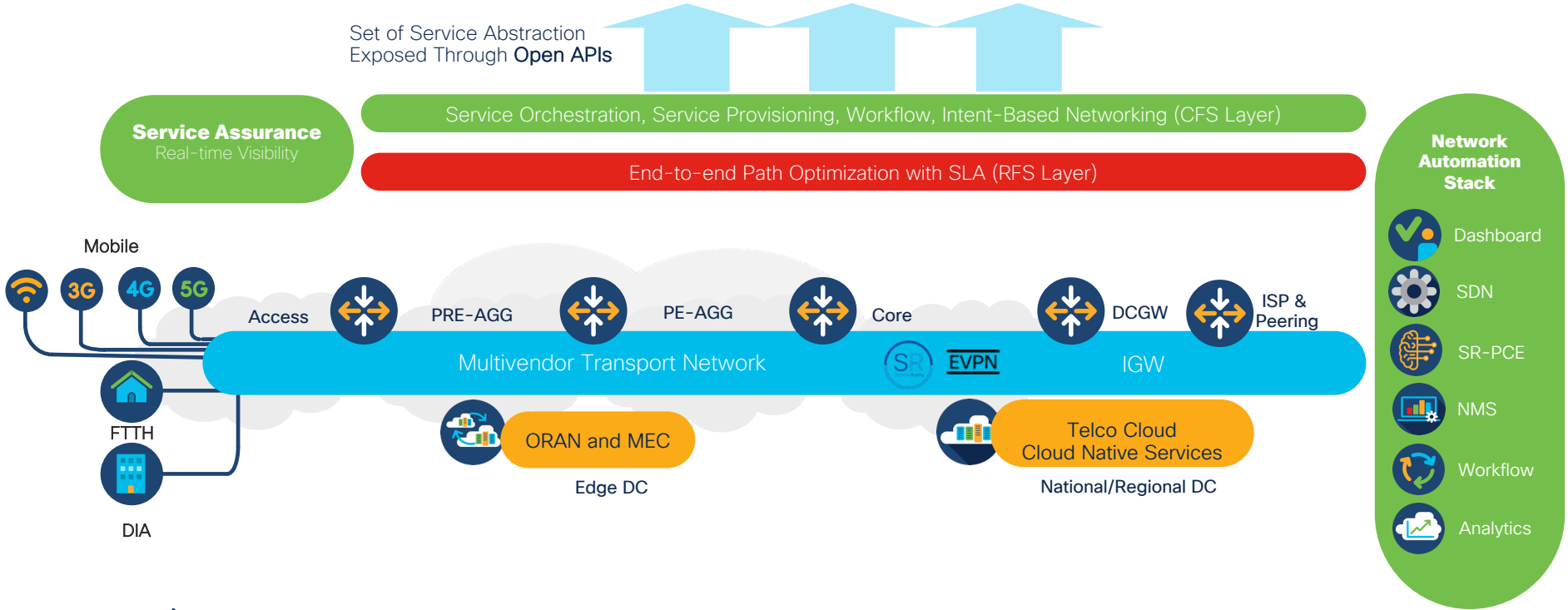
EVPN

Network simplification

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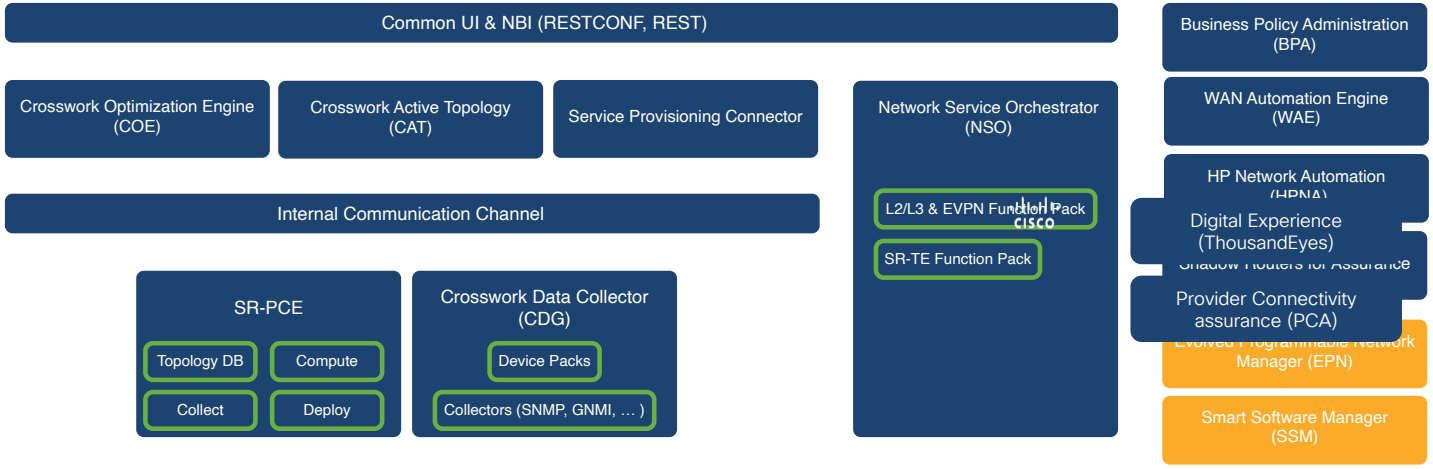
Transport Network Architecture Overview

Network as a Platform – Fueling KSA Digitization



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Transport Automation High-Level Architecture



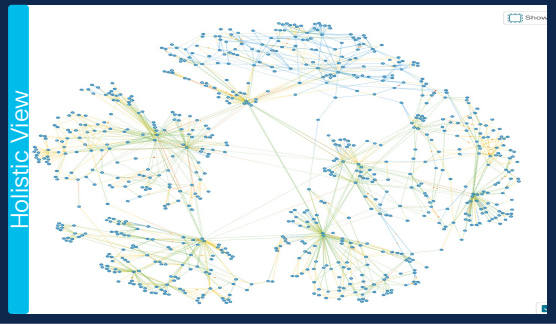
Accelerated Service Fulfilment

Eliminate Human Mistakes

Faster Time To Market

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1



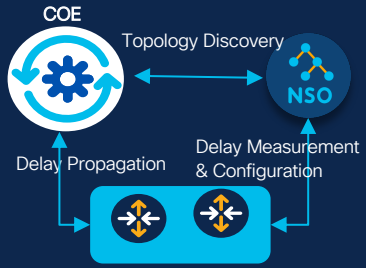
Network Visualization

Use Case: CNC near real time network and devices topology view, e2e low delay path view

Outcomes:

1.Automatic discovery of new nodes and links
2.Multivendor
3.Single pane of glass
4.CAPEX and OPEX reduction

2



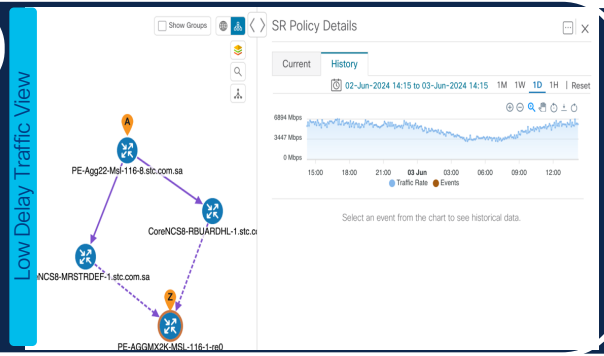
Real-time measurement & visualization

Use Case: Automated Measurement and delay configuration on MPLS Links (2800+)

Outcomes:

1. First use-case to capture the delay (no visibility before)

3



Latency Aware Traffic Steering

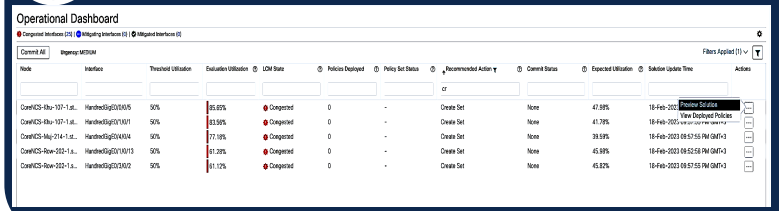
Use Case: *Automated low delay traffic steering in stc network*

Outcomes:

1. stc ranked number one for gaming performances
2. From months of deployments to a few minutes delay aware services deployments

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4



Local Congestion Mitigation

Use Case: Closed loop congestion Mitigation

Outcomes:

1. Reduce MTTR from 2 hours to 20 min
2. Self optimized to any fiber cuts
3. Auto updated dashboard

5



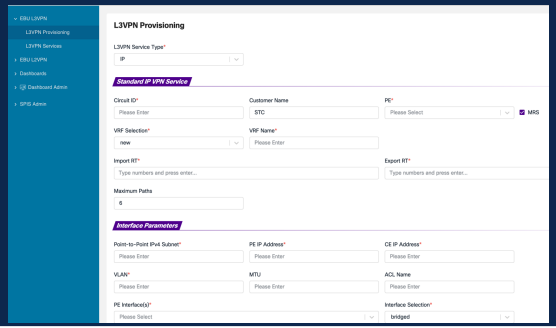
Disaster Recovery

Use Case: Automated Migration for Cisco, Juniper and Huawei routers to Cisco DR routers

Outcomes:

1. Multivendor
2. Few clicks for migration
3. Interfaces and config auto-discovery
4. Reduce the MTTR from 4 hours to 1 hour

6



E2E Automated Fulfillment for new services

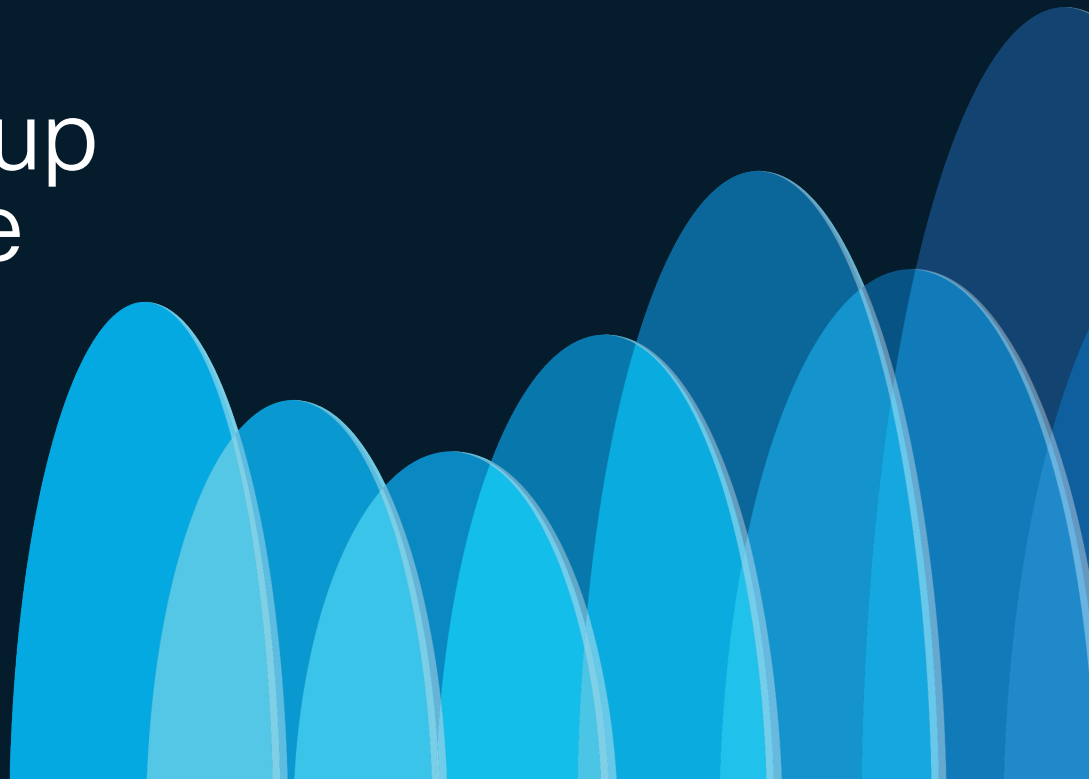
Use Case: Zero Touch for new L3VPN and L2VPNs Services Creation

Outcomes:

1. Multivendor support covering B2B services
2. Unified portal for all the services (single pane of glass)
3. Flawless deployment and automated delivery ensured by thorough pre and post
4. Fast to Market from 2 days to 15 minutes

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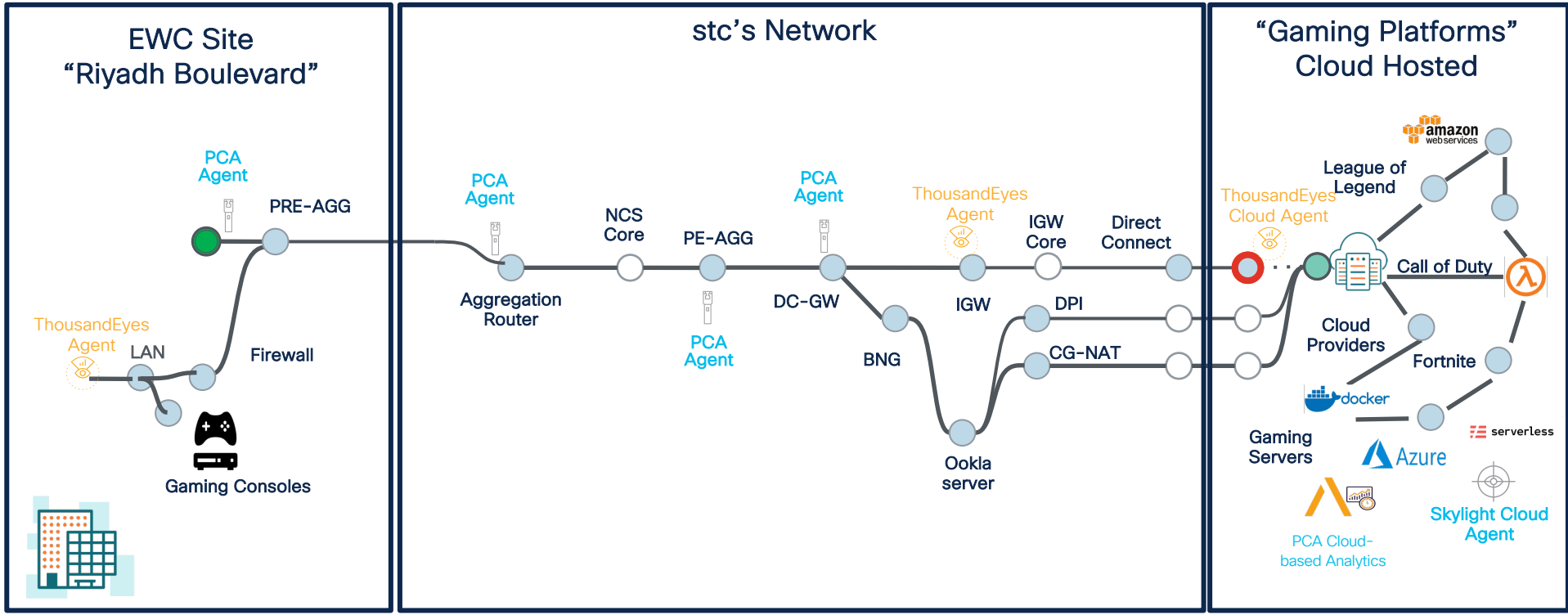
Esports World Cup Proactive service assurance



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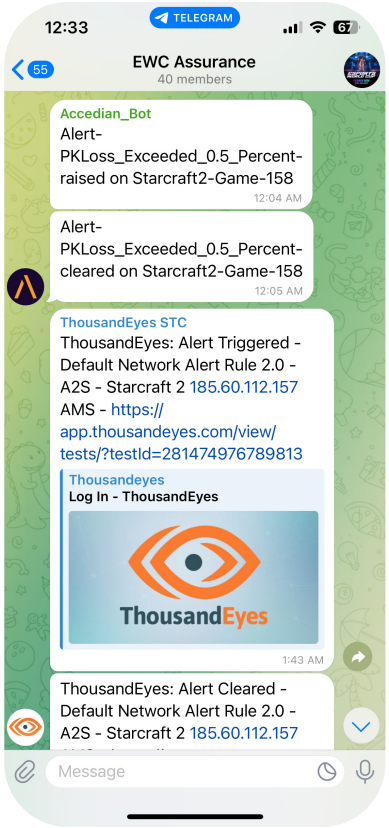
Enabling stc's Service Centric Proactive Assurance

end-to-end service assurance with Cisco PCA and ThousandEyes

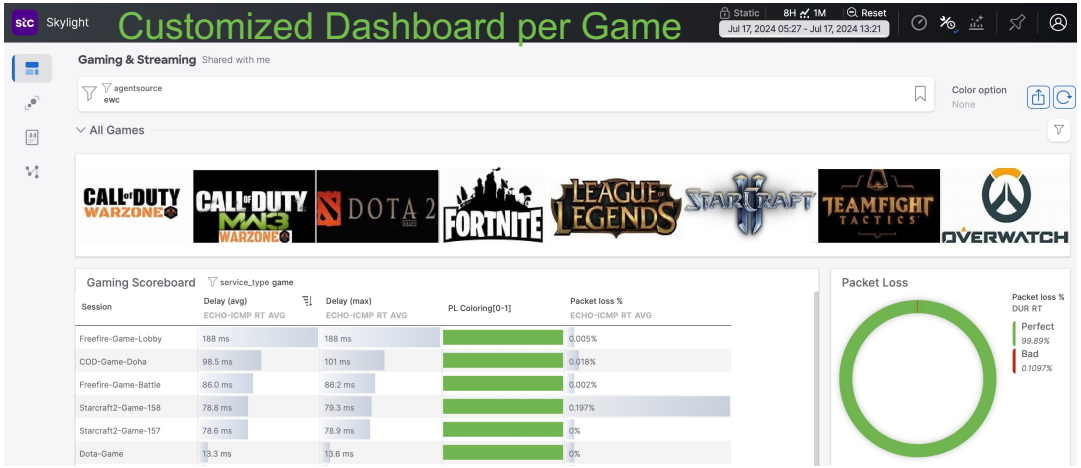


When Something went wrong… we could proactively detect, identify and take action

Automated alerting & Trouble ticketing

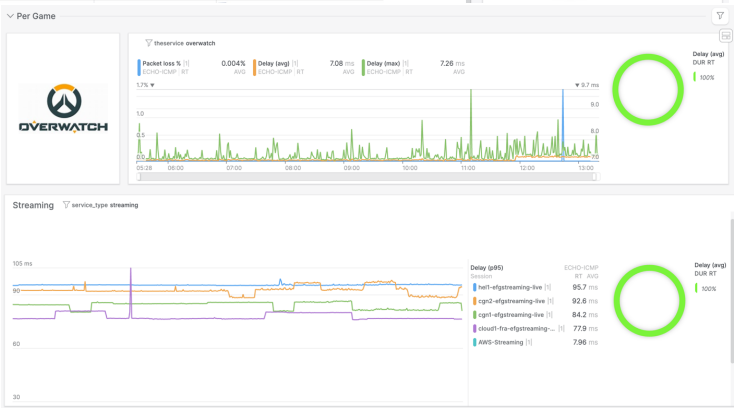


Customized Dashboard per Game



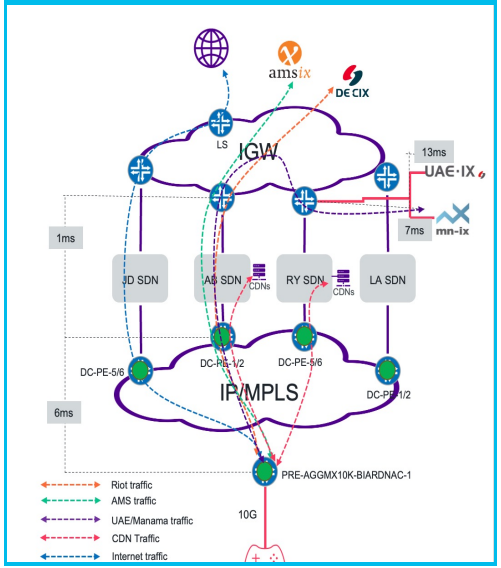
Digital Experience Assurance (DXA) with ThousandEyes



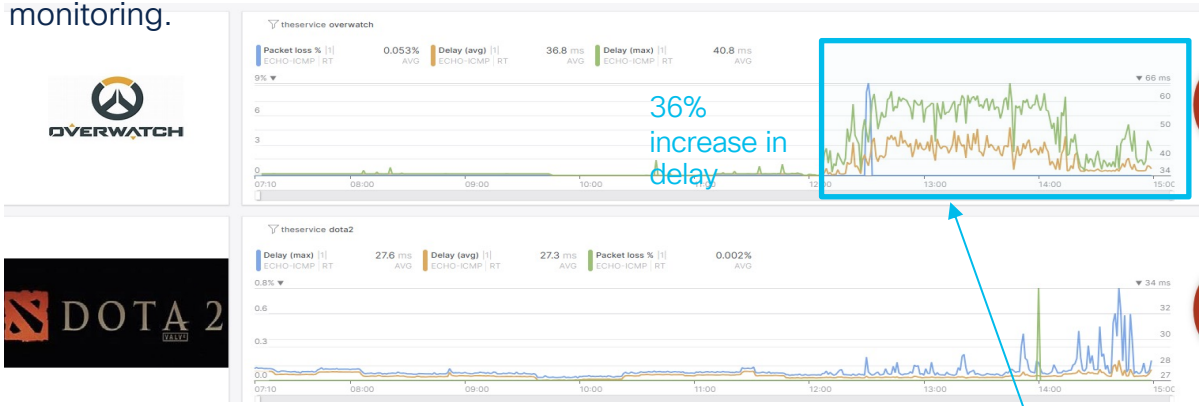


When Something went wrong...

Continuous E2E Monitoring for **Service** and **Network** performance

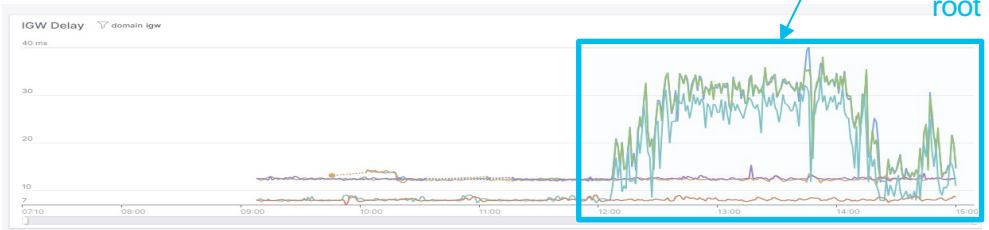


Active **Service** monitoring.



Correlate service & network performance → Immediately Identify root cause

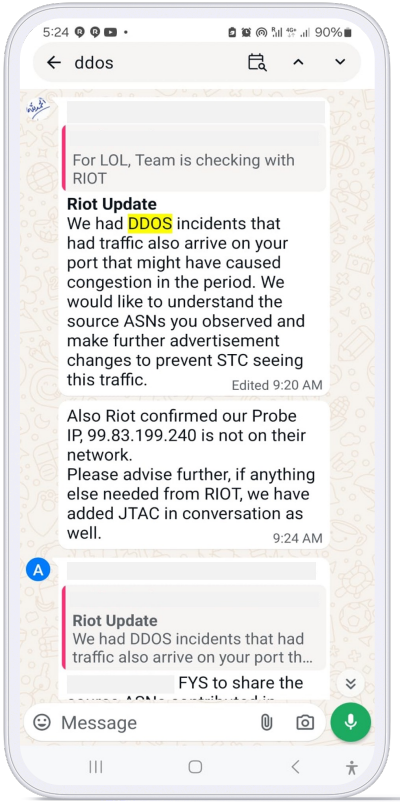
Active **Network** monitoring.



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When Something went wrong… Example #1



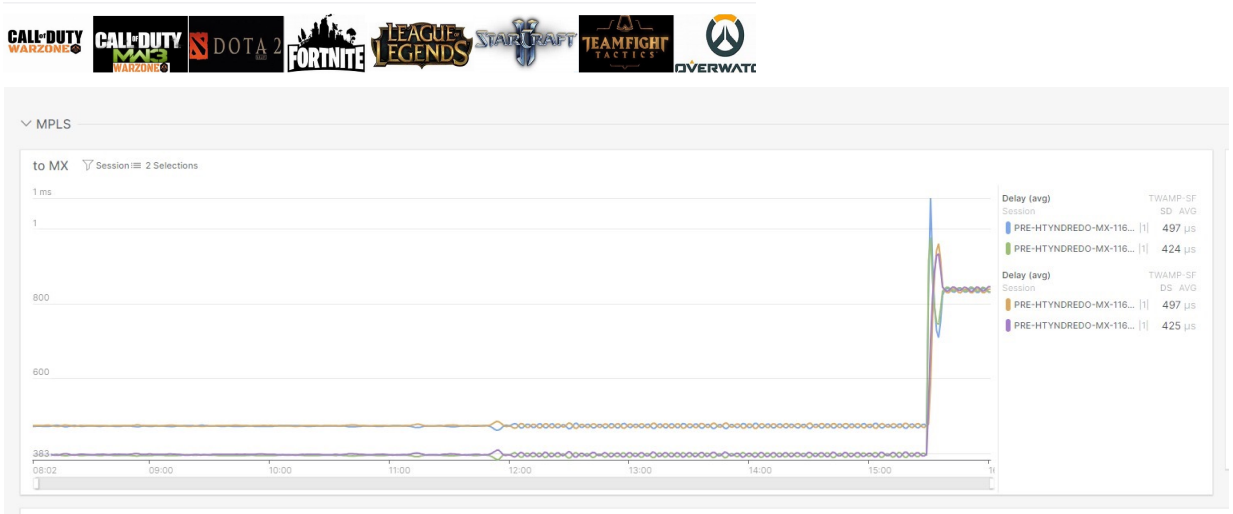


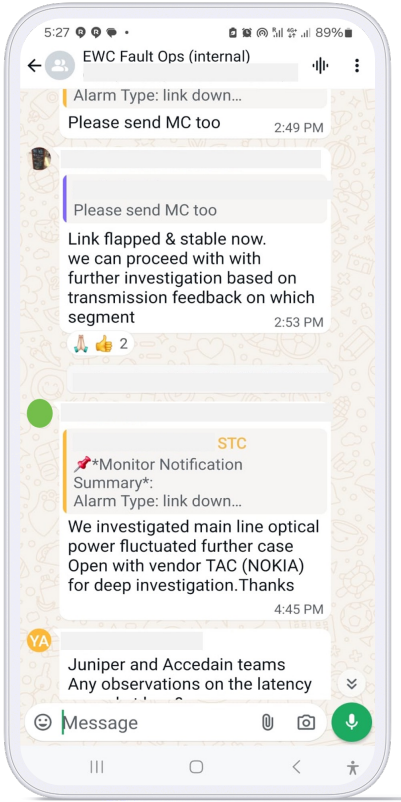
Observation

- Sudden Spike in delay for StarCraft game
- No other game was impacted
- No issue in MPLS and in the international carrier connectivity
- DDoS False identification of StarCraft traffic confirmed by CS team

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When something went wrong… Example #2



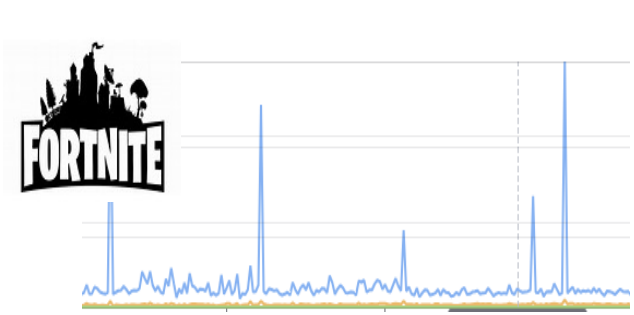


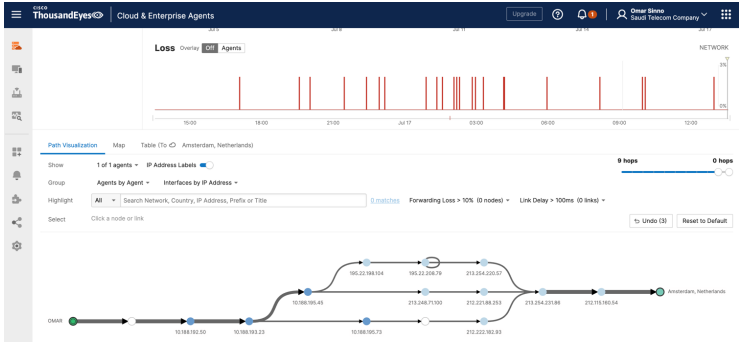
Observation

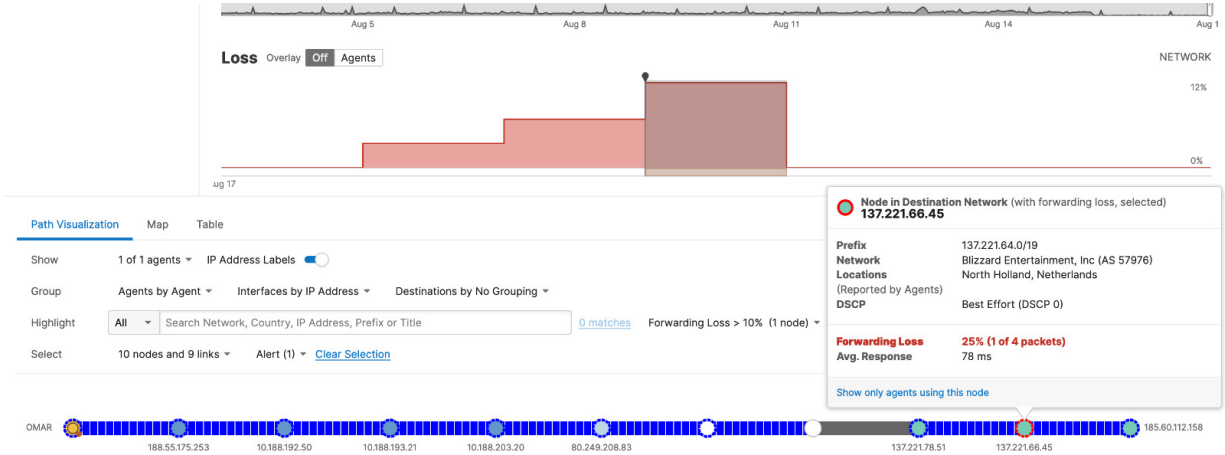
- Sudden increase in delay is observed on all games without packet loss
- Identical observation on both e2e testing and MPLS segmented view
- Fiber cut confirmed, traffic rerouted. New route has longer path, explaining the increase in delay

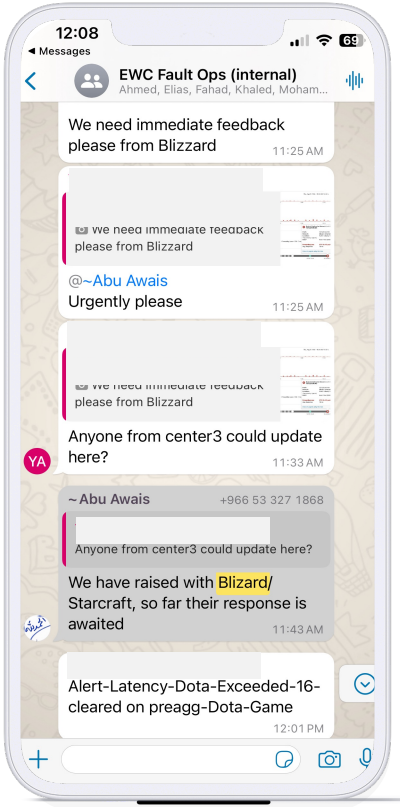
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When something went wrong… Example #3









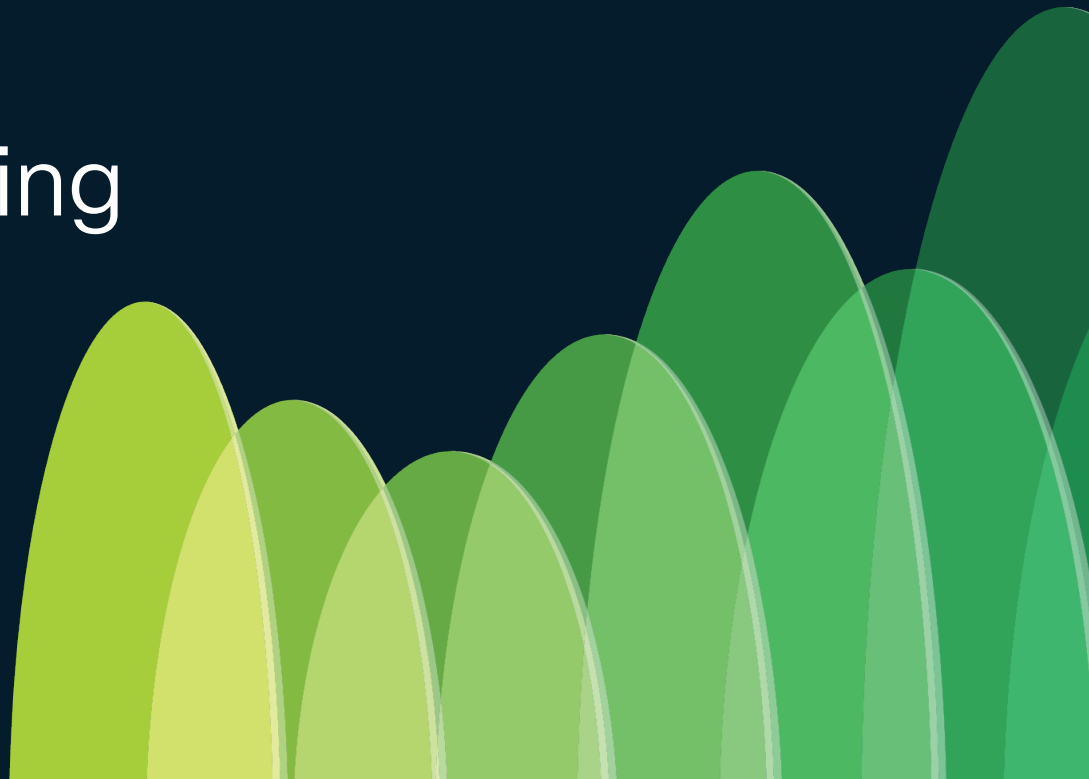
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Business Value Realization of Cisco's E2E Service Assurance Solution

Use Case Visualize, detect, act	Before Digital Experience & PCA (Baseline)		After Digital Experience & PCA (Improvement)
E2E per game granular service performance Monitoring	N/A	→	Realtime service performance monitoring
Performance Segmentation (customer LAN, Access, MPLS, IGW, inter carrier)	Multiple tools, dashboards, no visibility on customer network or public Cloud / Internet	→	Unified dashboard*with e2e visibility, LAN to cloud multivendor, multidomain
Improve Customer Experience	Reactive network monitoring	→	Fix issues before end-user QoE is impacted
Differentiate services	Poor Resolution of performance monitoring	→	Advanced performance reporting and SLAs Upsell end-customer portal
Network and service monitoring	low resolution 5mins (best 1min) aggregation	→	Sub-second sampling µSec resolution, 1-way metric

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Summary & looking to the future



Summary End to End visibility, performance and assurance Scope

End-to-End Assurance
(telescope)



+

Provider Connectivity Domain Assurance
(microscope)



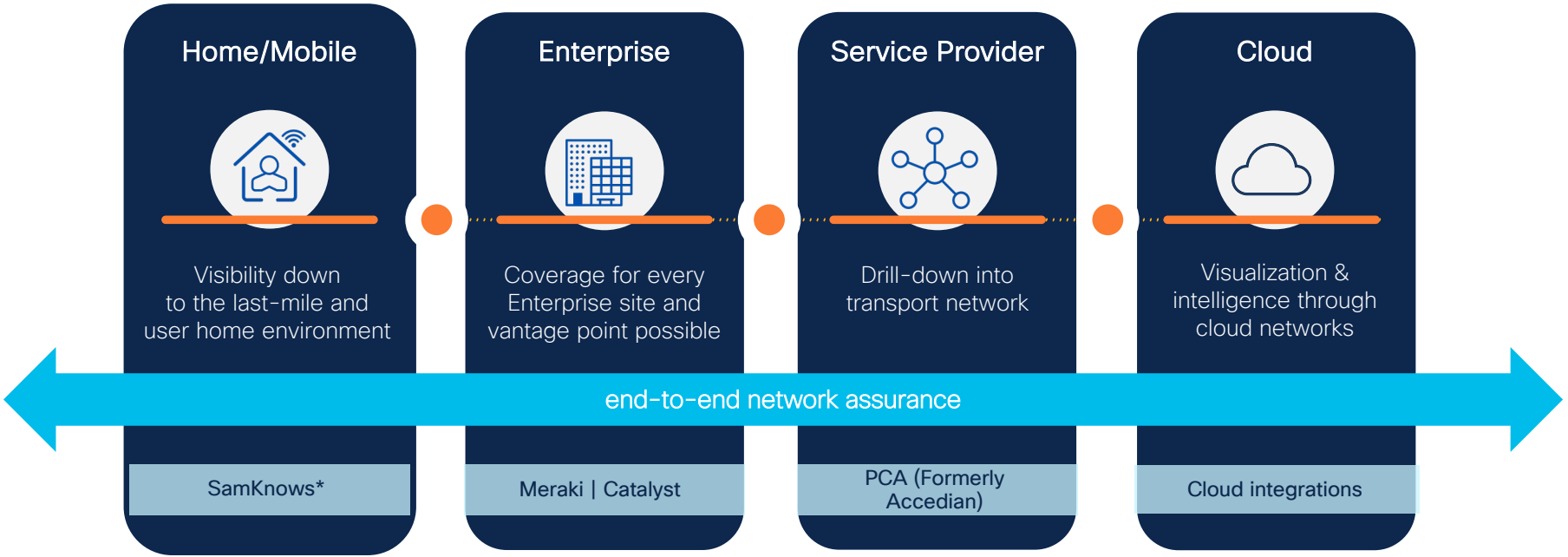
ThousandEyes will provide Multi-domain From any user, to any app, over any network Experience-centric

PCA will provide deep insights down to device for owned network infrastructure

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e2e visibility with the right lens for every assurance

Driving connected insights and closed-loop automations across every domain

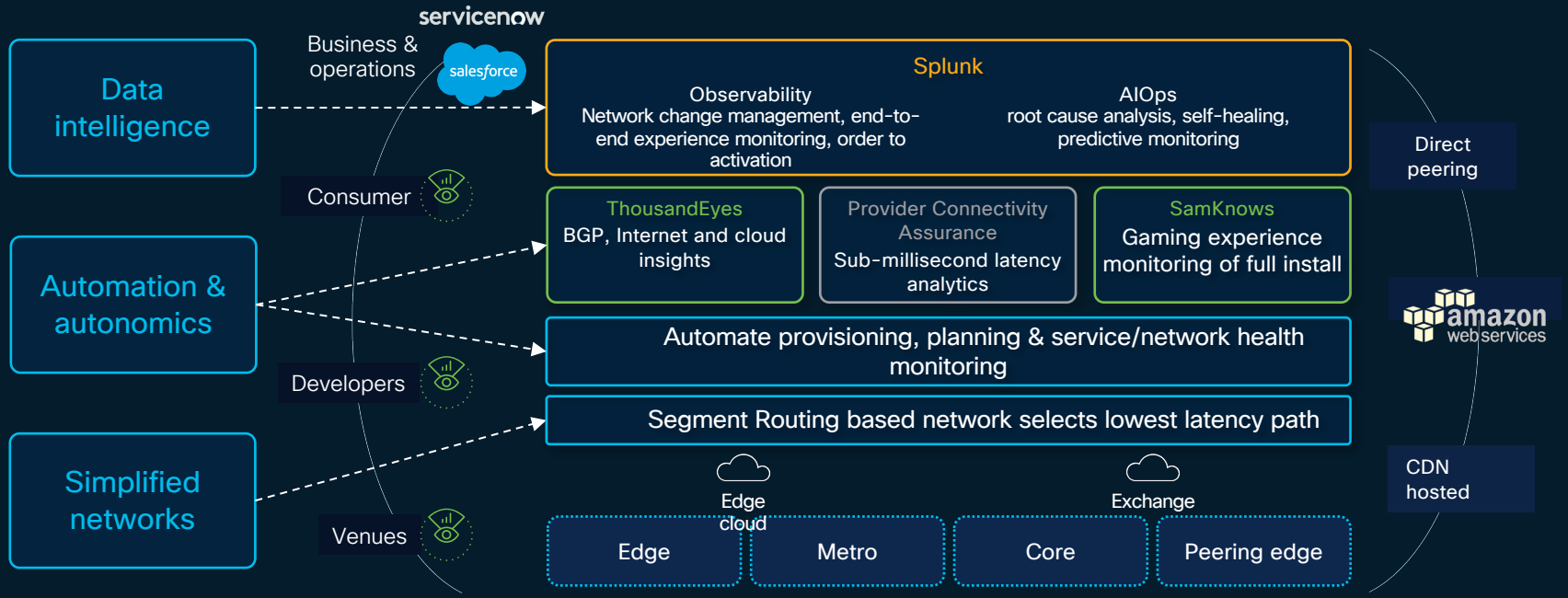


*Now part of ThousandEyes

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Looking into the future...

Network monetization, operational efficiency, and experience excellence



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Webex App

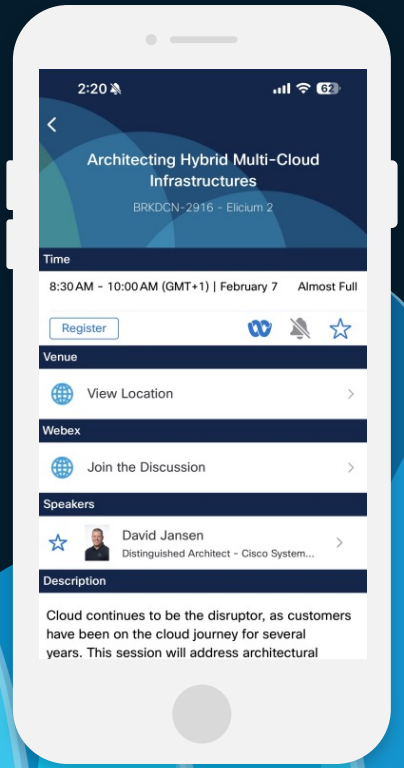
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4. Enter messages/questions in the Webex space

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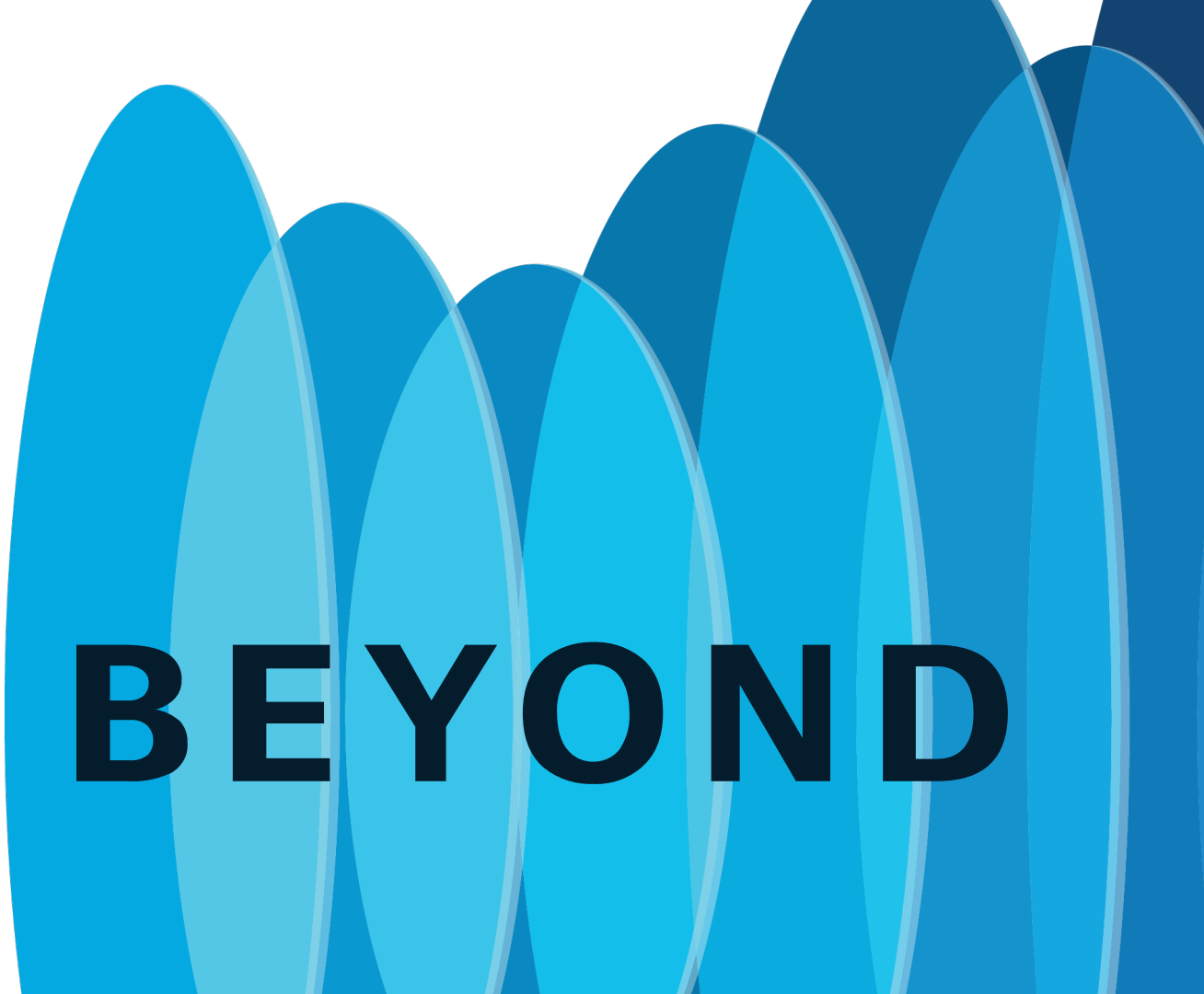
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