

The background is a vibrant, abstract graphic. It features a central bright white light source from which numerous colorful rays emanate, creating a sunburst or starburst effect. The rays transition through a spectrum of colors including yellow, orange, red, and various shades of blue and green. Overlaid on this are several large, semi-transparent, wavy shapes in similar color tones, giving the overall image a sense of motion and energy.

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The bridge to possible

Rethinking Network Monitoring with ThousandEyes

Kemal Sanjta, Principal Internet Analyst

@kemalsanjta
BRKAPP-2013

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Webex spaces will be moderated by the speaker until June 9, 2023.

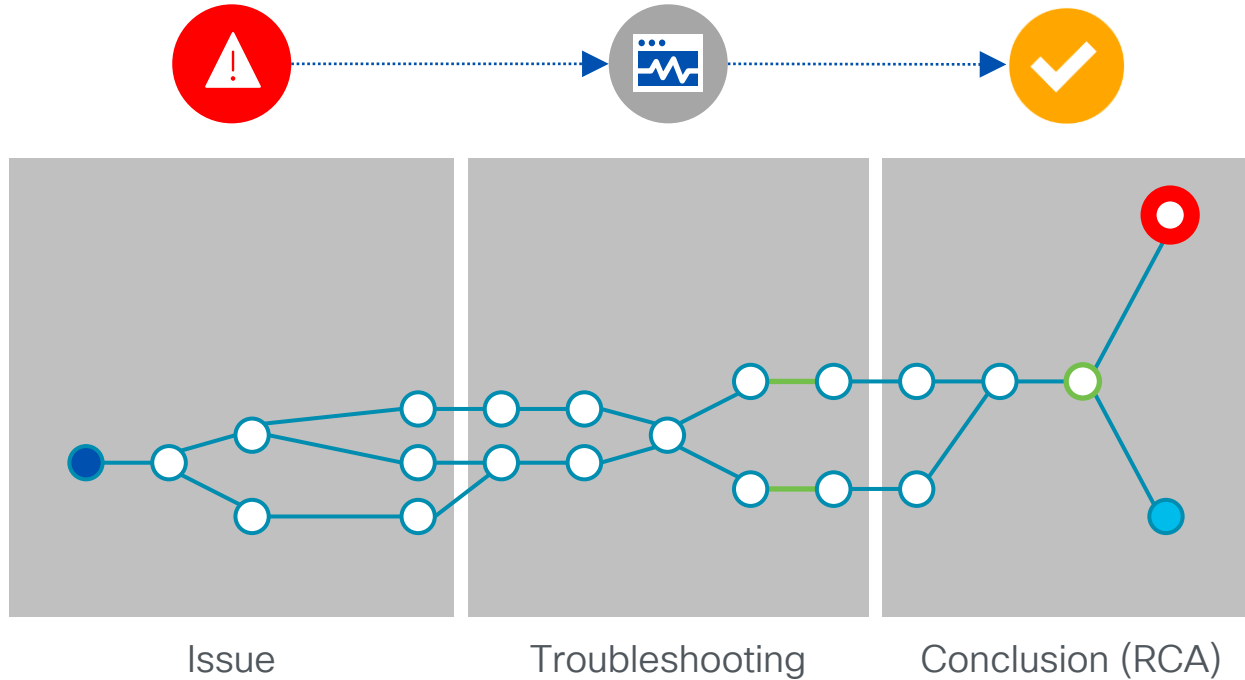


<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKAPP-2013>

Agenda

- Traditional approach to monitoring and challenges
- Proactive monitoring
- Automation
- Active Network Monitoring
- Conclusion

Troubleshooting Lifecycle



Issues with Troubleshooting Tool Set



Traceroute

- Fails to discover nodes
- Fails to discover links
- Reporting of false links



Ping

- Control plane reliance

Improvements to Troubleshooting Tool Set

Ping and traceroute as good as a starting point,
but we realized we need something more



MTR

Paris
traceroute

Dublin
traceroute

NLNOG
RING

Various Sources for Alerting



SYSLOG



SNMP



Streaming telemetry solutions



Various “collections” (ssh logins, etc).



Can your
control plane
handle it?

What is the Problem?

TIME

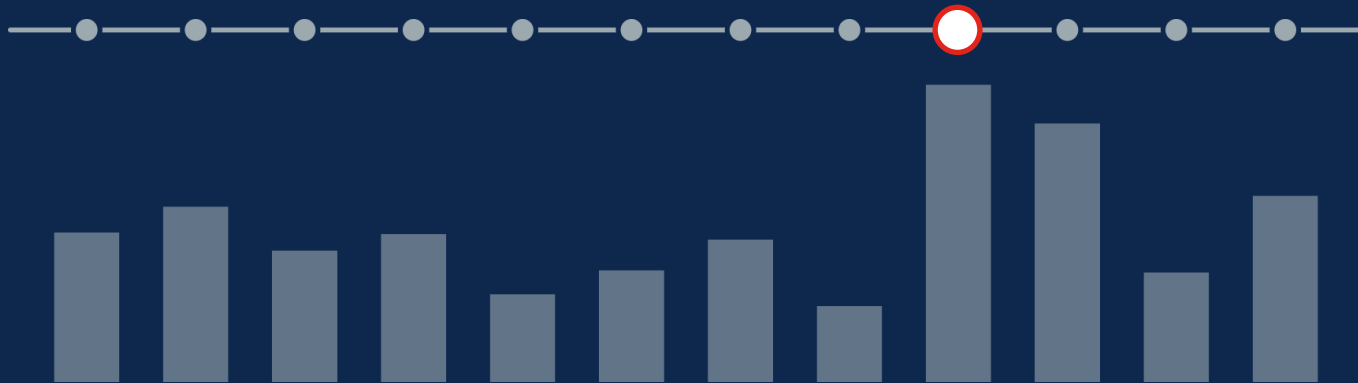
Reactive nature of troubleshooting

Slow
response

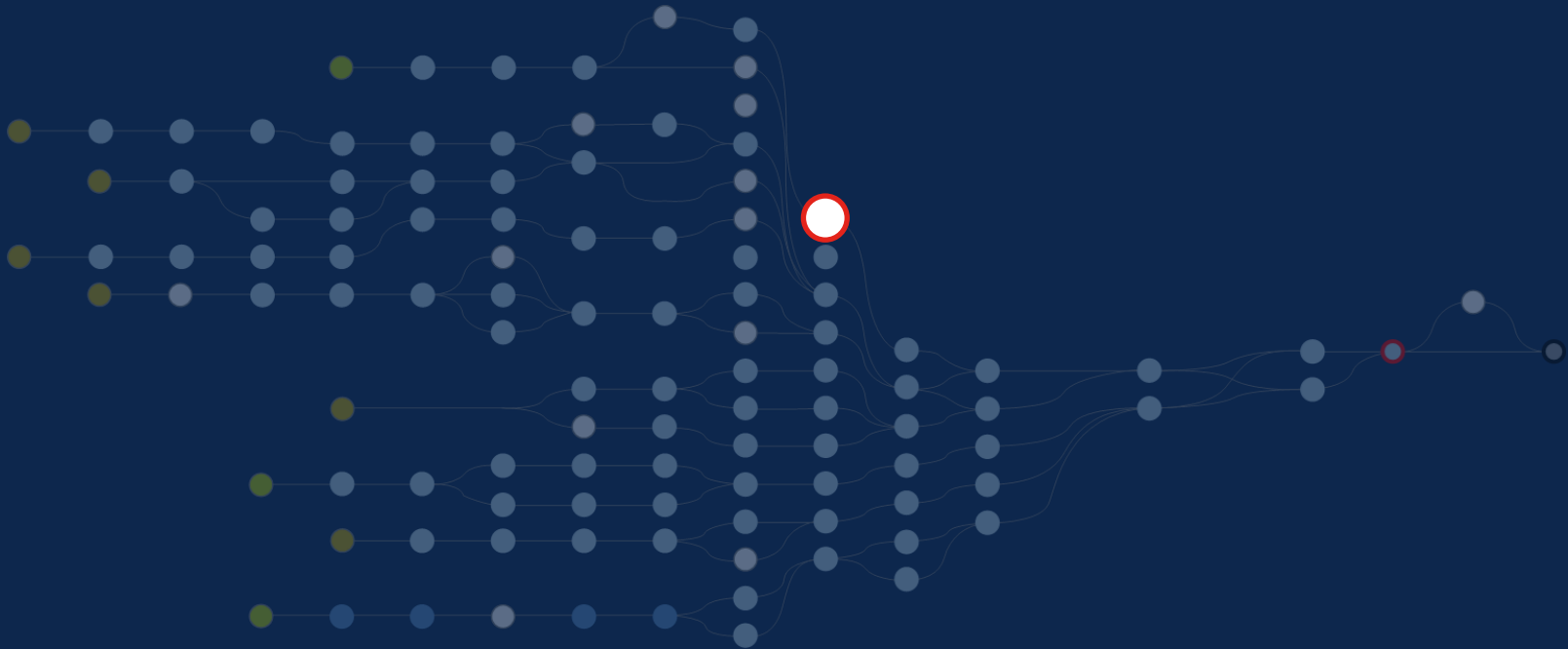
Service
degradation

Unhappy
customers

ThousandEyes approach: Timeline



ThousandEyes approach: Path Visualization

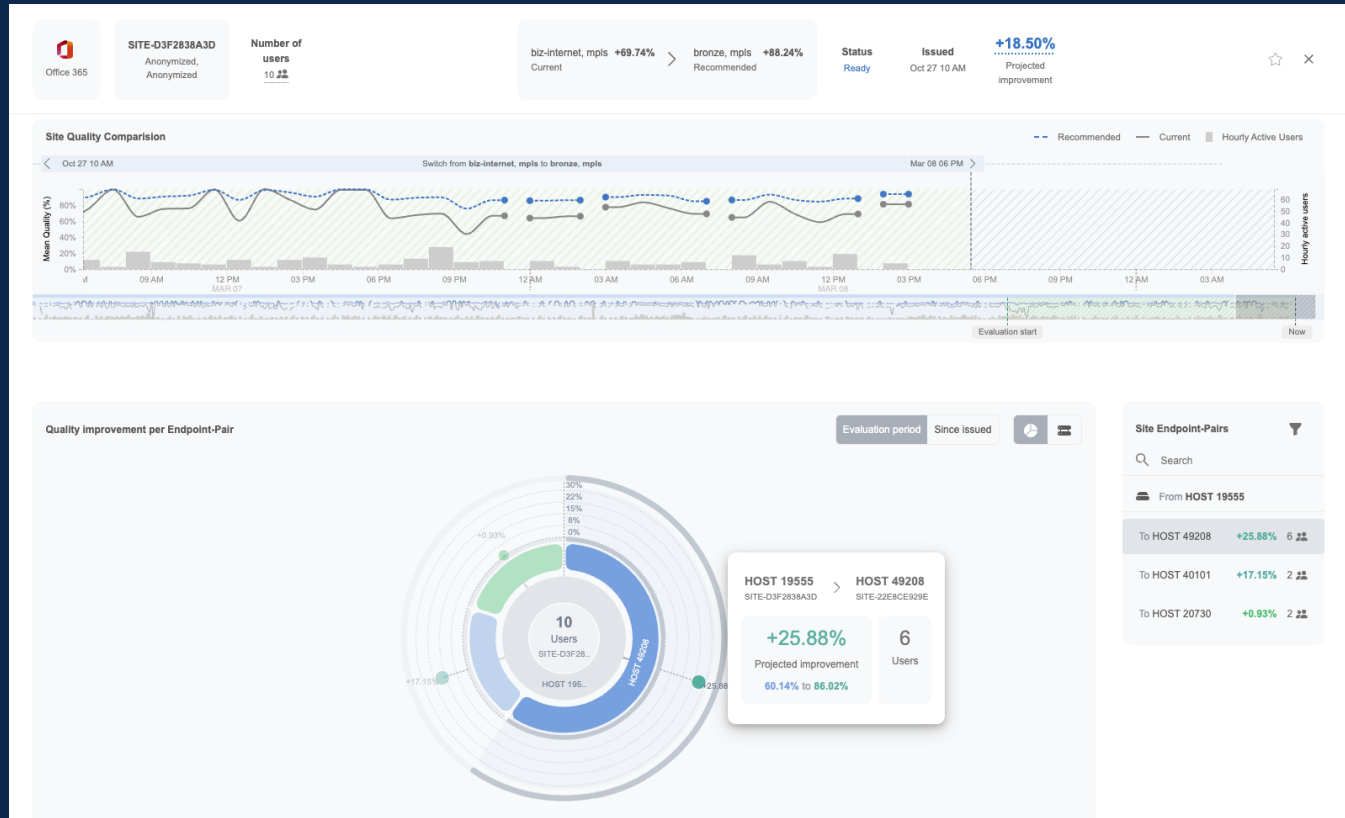


Know when and where it happens

Is there another way?

PROACTIVE

WAN Insights



The next best thing is...

AUTOMATION

We discovered...



Python
(and countless libraries)

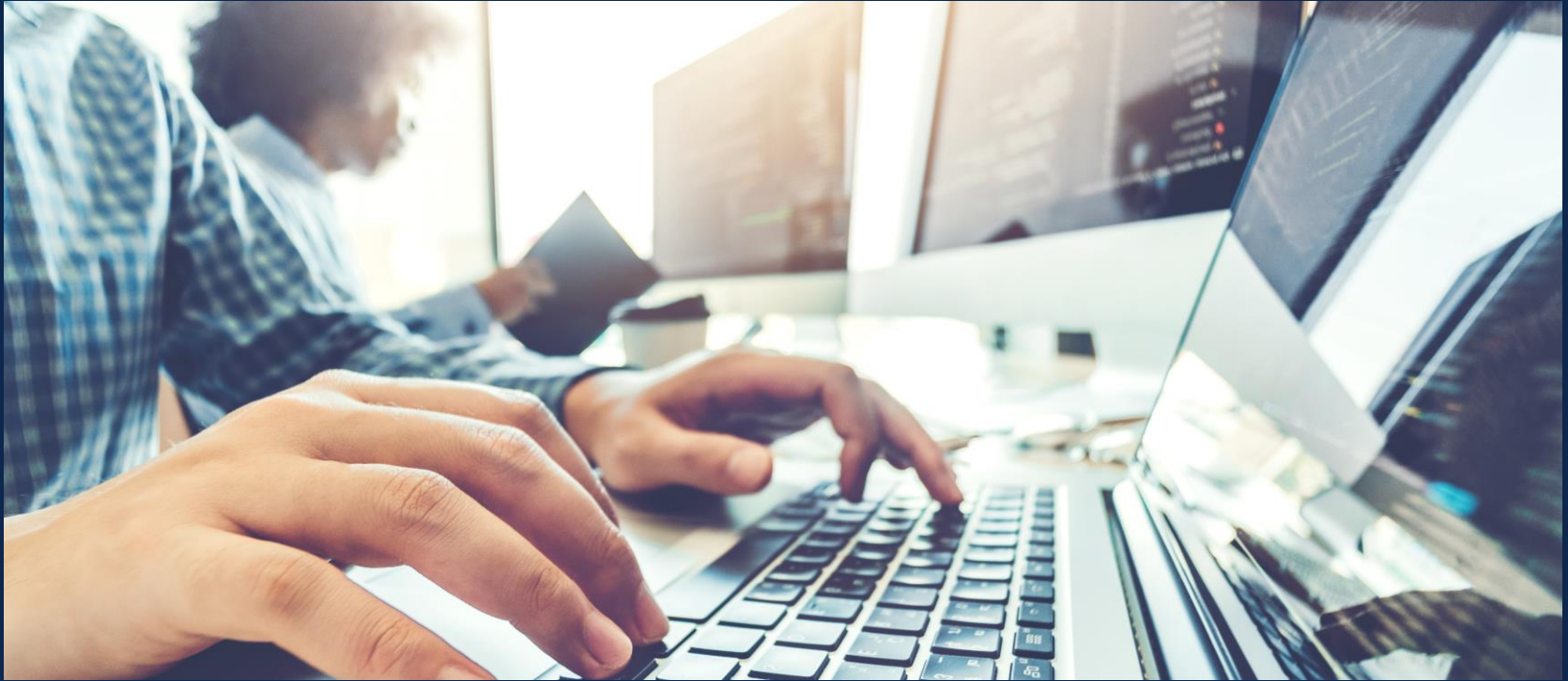


Go Programming Language
(and its concurrency)



A few frameworks along the
way like Ansible

ThousandEyes features a comprehensive API



Once Automation Provided Results...

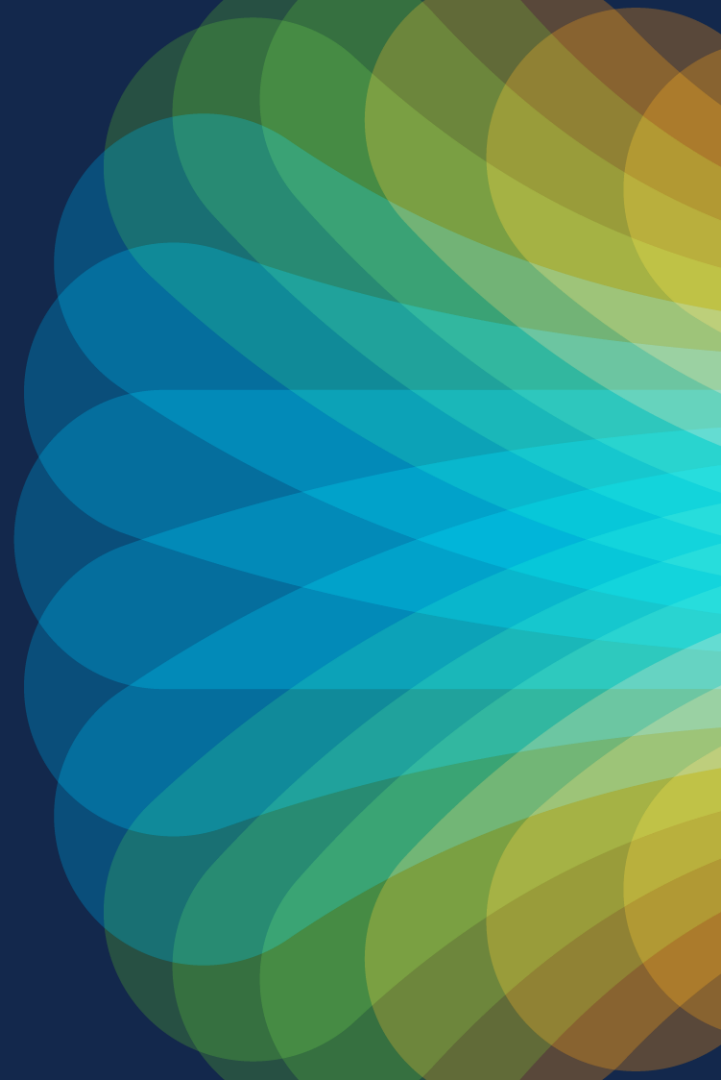
Did we ever have a good
picture of the performance
of *our* networks?

How Many Times Have You Heard...

- Line cards rebooting as a result of solar flares?
- Counters for precisely that issue that is not user-exposed?
- Counters exist, but you need to be a line card level wizard to get them? (Involves knowing a good deal about architecture and silicon/ASIC type)
- Backplane was hit with this specifically crafted package that took your fully redundant backplane down?
- Control plane cannot handle it?

The next best thing is...

Active Network Monitoring



Challenges with Active Network Monitoring

- Large scale/enterprise networks moved to CLOS Fabric Designs
- Limiting the “blast radius”
- Smaller scale devices, in turn, suffer from smaller RIB/FIB sizes and weak Control planes

Questionable if they are really smaller scale devices

Conceptual Solution

- Utilize data plane to measure experience
(fundamental concept behind the Active Network Monitoring)
- Synthetic traffic (UDP or TCP)



ThousandEyes approach

- Synthetic testing from different vantage points using Cloud/Enterprise/Endpoint Agents for various types of use cases



THE INTERNET

The Internet



- Packet Loss
- Latency
- Jitter
- BGP
(advertisements & withdrawals)
- Prefix hijacks

Solutions for Internet Monitoring

Traditional
troubleshooting
set of tools
(still reactive)

ThousandEyes approach



Conclusions

- Observability is paramount
- Learn how to code
(required skill to deploy and manage networks and market is moving towards it)
- Utilize research papers and RCA documents
(do not repeat someone else's mistakes)
- Move to active network monitoring



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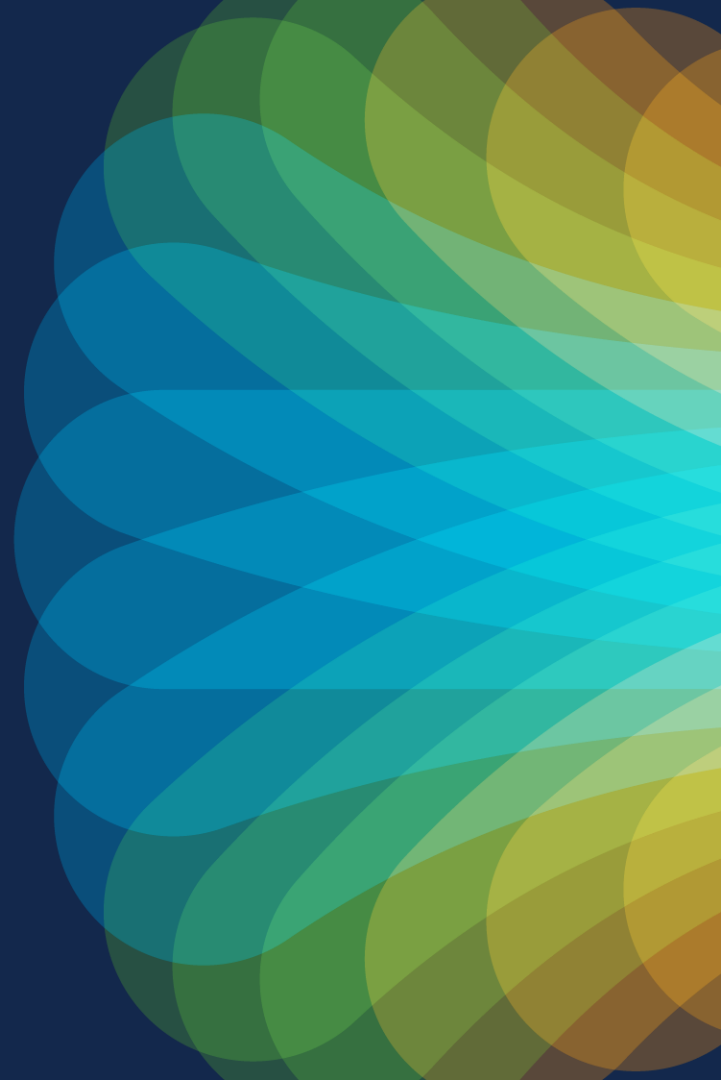


The bridge to possible

Thank you



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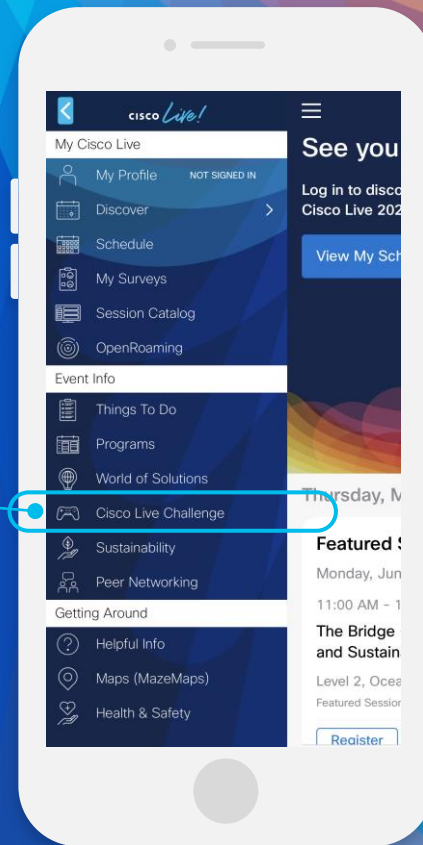


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The background features a vibrant, multi-colored abstract design. On the left, there are overlapping, wavy bands of color in shades of red, orange, yellow, and green. On the right, a bright white light source emits a series of sharp, radiating lines in various colors, including blue, green, and yellow, creating a sunburst effect.

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