

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 background are large, semi-transparent, wavy shapes in similar color tones, giving the overall image a sense of motion and energy.

cisco *Live!*

Let's go

#CiscoLive



The bridge to possible

# API First in a CLI world

How to think about API first

Ray Stephenson, Sr Director, Head of Developer Relations

Anne Gentle, Leader, Global Developer Experience

DEVNET 1050



#CiscoLive

# Cisco Webex App

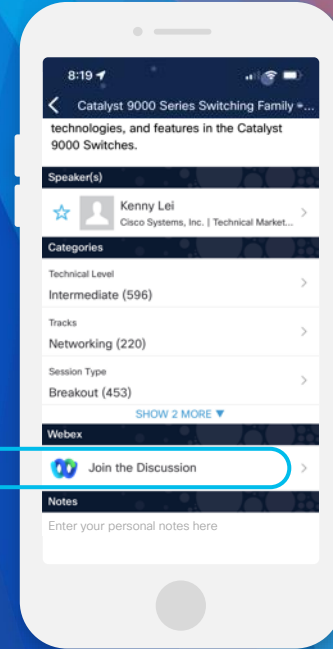
## Questions?

Use Cisco Webex App to chat with the speaker after the session

## How

- 1 Find this session in the Cisco Live Mobile App
- 2 Click “Join the Discussion”
- 3 Install the Webex App or go directly to the Webex space
- 4 Enter messages/questions in the Webex space

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



<https://ciscolive.ciscoevents.com/ciscolivebot/#DEVNET-1050>

# Agenda

- Why APIs?
- Patterns
- What Cisco is doing
- API first principles
- Conclusion

# Why APIs?

# Why APIs?

“a pre-negotiated point of responsibility”

a way for any two programs to

- communicate

- share data

- trigger actions

# Monolith



# Monolith with APIs





# Travel agency – built on other APIs



# Patterns



# So how does this apply in the CLI world?

CLI as the only way to interact

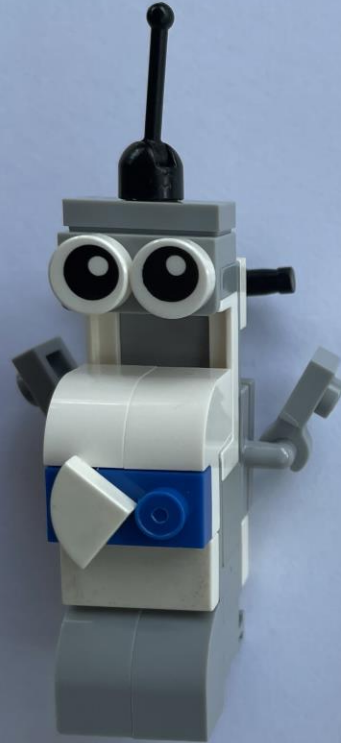
CLI built on an (internal) API

CLI built on a public API

# What if...



You could make a  
LEGO Devvie!







Inventory

# Discovery



3003



11211



3795



3040b



3040b



3039



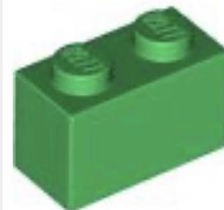
3039



3039



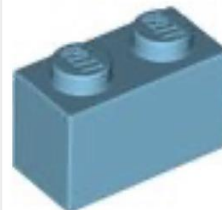
3004



3004



2456



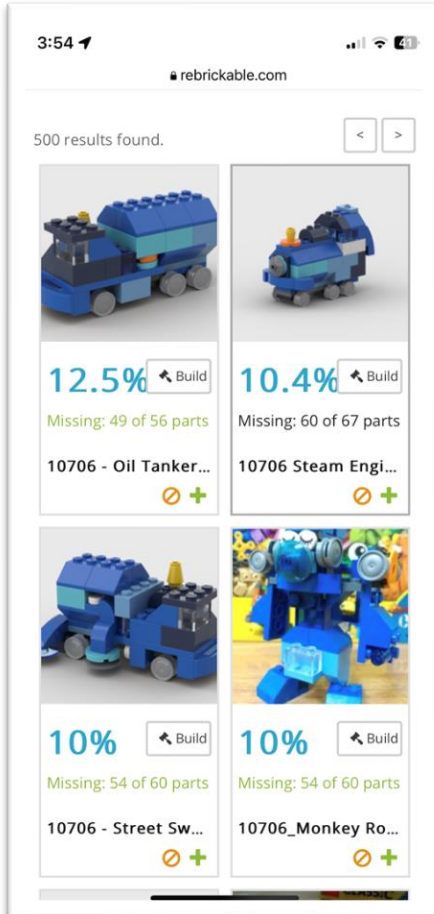
3004

# YANG Model

```
agentle@AGENTLE-M-229C:~/src
~/src > ssh -oHostKeyAlgorithms=+ssh-dss admin@sandbox-iosxe-latest-1.cisco.com -p
830 -s netconf
admin@sandbox-iosxe-latest-1.cisco.com's password:
<?xml version="1.0" encoding="UTF-8"?>
<hello xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
<capabilities>
<capability>urn:ietf:params:netconf:base:1.0</capability>
<capability>urn:ietf:params:netconf:base:1.1</capability>
<capability>urn:ietf:params:netconf:capability:writable-running:1.0</capability>
<capability>urn:ietf:params:netconf:capability:rollback-on-error:1.0</capability>
<capability>urn:ietf:params:netconf:capability:validate:1.0</capability>
<capability>urn:ietf:params:netconf:capability:validate:1.1</capability>
<capability>urn:ietf:params:netconf:capability:xpath:1.0</capability>
<capability>urn:ietf:params:netconf:capability:notification:1.0</capability>
<capability>urn:ietf:params:netconf:capability:interleave:1.0</capability>
<capability>urn:ietf:params:netconf:capability:with-defaults:1.0?basic-mode=explicit&also-supported=report-all-tagged,report-all</capability>
<capability>urn:ietf:params:netconf:capability:with-operational-defaults:1.0?basic-mode=explicit&also-supported=report-all-tagged,report-all</capability>
<capability>urn:ietf:params:netconf:capability:yang-library:1.0?revision=2019-01-04&module-set-id=72c44eca39742896115d6c2b36780562</capability>
<capability>urn:ietf:params:netconf:capability:yang-library:1.1?revision=2019-01-04&content-id=72c44eca39742896115d6c2b36780562</capability>
<capability>http://tail-f.com/ns/netconf/actions/1.0</capability>
<capability>http://cisco.com/ns/cisco-xe-ietf-ip-deviation?module=cisco-xe-ietf-ip-deviation&revision=2016-08-10</capability>
<capability>http://cisco.com/ns/cisco-xe-ietf-ipv4-unicast-routing-deviation?modul
```



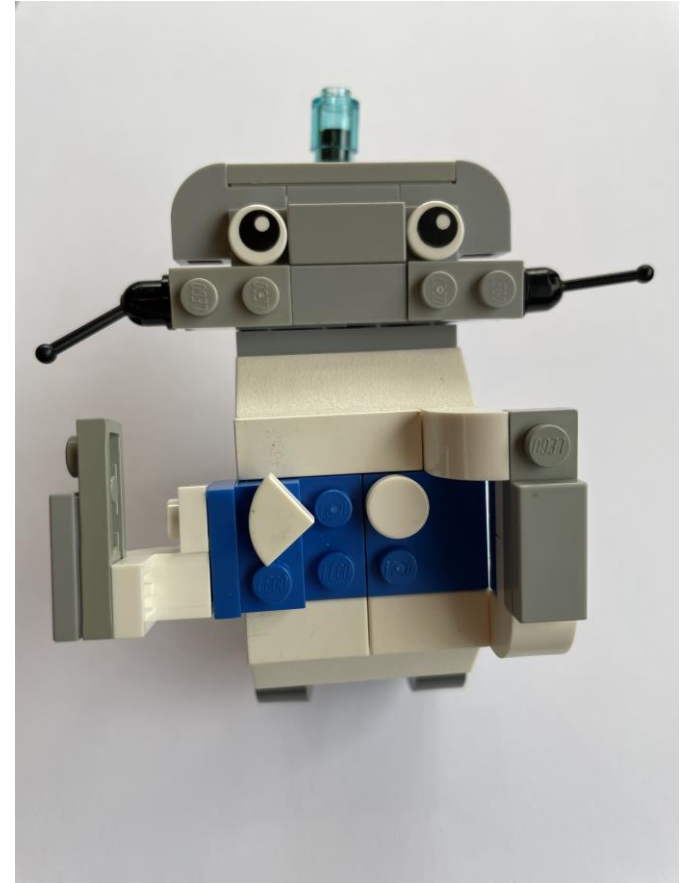
# Reconfigure



Now you can:

Make a vehicle or animal  
or your own robot  
or

Reconfigure your  
network by sending a  
new model



# Reconfigure your Network

```
15     <interface>
16         <name>GigabitEthernet2</name>
17         <description>WAN Interface</description>
18         <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-type">ianaift:ethernetCsmacd</type>
19         <enabled>true</enabled>
20         <ipv4 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip">
21             <address>
22                 <ip>172.16.12.1</ip>
23                 <netmask>255.255.255.0</netmask>
24             </address>
25         </ipv4>
26         <ipv6 xmlns="urn:ietf:params:xml:ns:yang:ietf-ip"/>
27     </interface>
```



# APIs for innovation

/users/{user_token}/parts/	Get a list of all the Parts in all th
/users/{user_token}/profile/	Get details abo
/users/{user_token}/setlists/	Get a list of all th
/users/{user_token}/setlists/	A
/users/{user_token}/setlists/{list_id}/	Delete a Set L
/users/{user_token}/setlists/{list_id}/	Get details about
/users/{user_token}/setlists/{list_id}/	Update an existing
/users/{user_token}/setlists/{list_id}/	Replace an existing
/users/{user_token}/setlists/{list_id}/sets/	Get a list of all the Sets in
/users/{user_token}/setlists/{list_id}/sets/	Add one or more Sets to the Set List. Existing S
/users/{user_token}/setlists/{list_id}/sets/{set_num}/	Delete a Se
/users/{user_token}/setlists/{list_id}/sets/{set_num}/	Get details about a specific
/users/{user_token}/setlists/{list_id}/sets/{set_num}/	Update an existing Set's det
/users/{user_token}/setlists/{list_id}/sets/{set_num}/	Replace an existing Set's det
/users/{user_token}/sets/	Get a list of all the Sets in the user'

# Meraki API

Now you can:

cellular	>
clients	▼
POST Provision Network Clients	
policy	>
search	▼
GET Get Organization Clients Search	
splashAuthorizationStatus	>
configTemplates	>
devices	>
earlyAccess	>
firmware	>
firmwareUpgrades	>
floorPlans	>
groupPolicies	>
health	>
inventory	>

## Get Organization Clients Search

**Operation Id:** `getOrganizationClientsSearch`

**Description:** *Return the client details in an organization*

GET `/organizations/{organizationId}/clients/search`

## Request Parameters

### Path

**organizationId** <sup>required</sup> | string

Organization ID

Parameters

Template

GET `/organizations/{organizationId}/clients/search`

**Organization Id\***  
Organization ID

Query Params ☐

Headers ▼

Run

# APIs vs CLIs

# Pattern: AuthN and AuthZ

Authentication and Authorization  
for automation

Generate tokens that expire in a  
time period or can be revoked

Scope tokens for only certain  
access



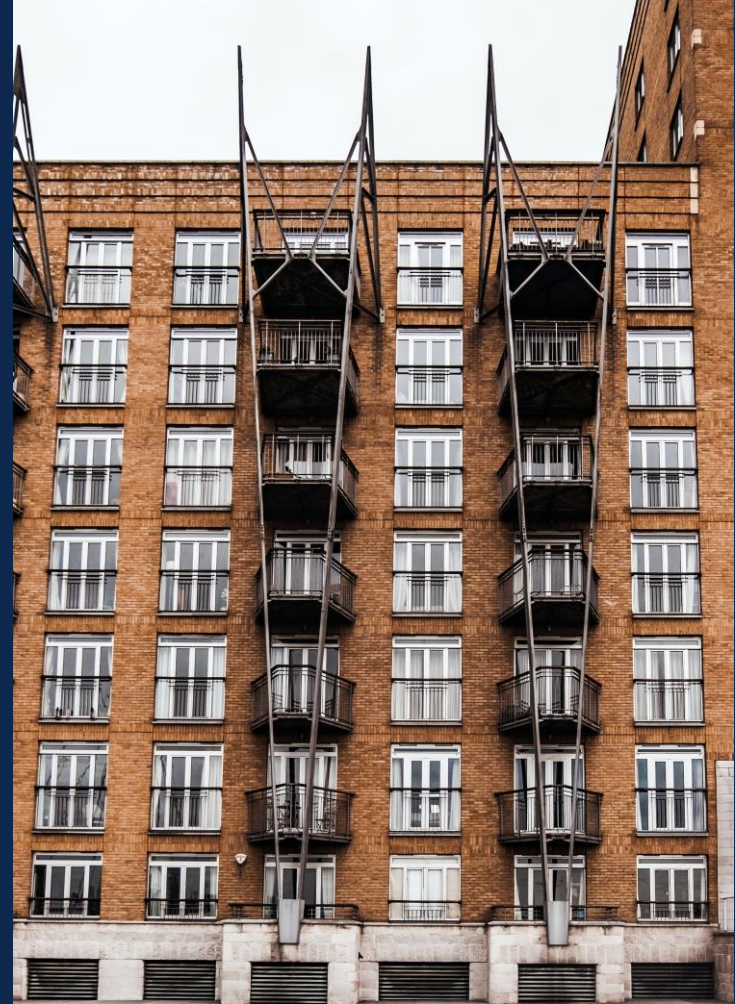
Photo by [Markus Spiske](#) on [Unsplash](#)

# Pattern: Data models

JSON = JavaScript Object Notation

Data filtering

Data sorting





# Pattern: Bulk operations

Instead of a BASH FOR DONE Loop  
Operate on thousands of objects



Photo by [Eric Prouzet](#) on [Unsplash](#)



# Pattern: Pagination

Get your data by size of page, next, previous, first, last

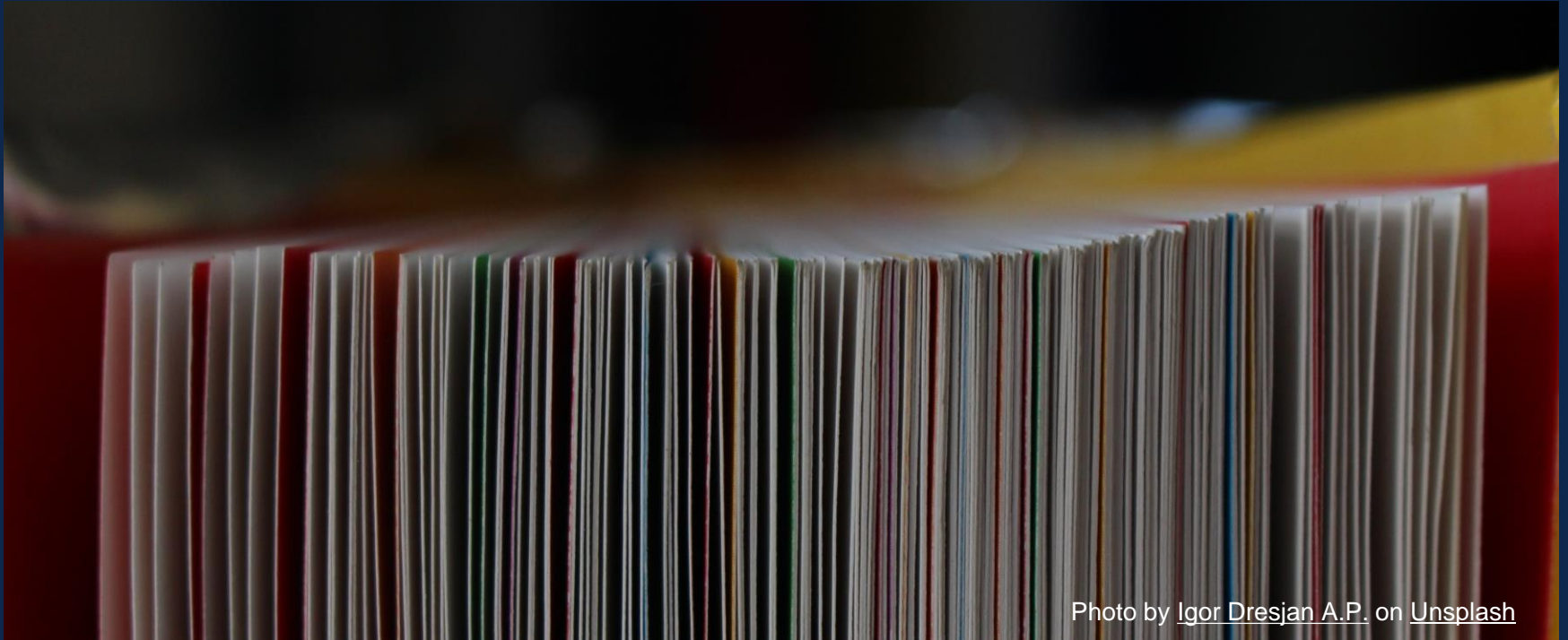


Photo by [Igor Dresjan A.P.](#) on [Unsplash](#)

# Pattern: Easier Integrations



Integrate with other  
API-based products or services



Example: ServiceNow

# Cisco API Worlds

- Networking:  
YANG Models for data
- Security: Massive data  
intake for Threat  
Hunting
- Collaboration:  
call center workflows
- Everywhere: REST API  
for functionality

# API first

# True North for API-first strategy

Partners and customers expect quality APIs that allow them to build new experiences and solutions on top of Cisco technologies.

Each product we ship needs to provide a way to access data and drive functionality via API.



# Cisco APIs

- Application Monitoring Tools
- Collaboration
- IoT
- Meraki
- Networking
- Data Center
- Cloud
- Security
- Cisco Customer Experience

<https://developer.cisco.com/docs/>

# Cisco Developer Program

Key areas to help you and your team succeed with Cisco APIs



Documentation



Learning Labs



Sandboxes



Community

[developer.cisco.com](https://developer.cisco.com)

# Cisco Metrics Search Engine (CMSE)





# What Cisco is doing



# Cisco's API Quality Journey

## Working with Product Engineering Teams

### Inception

DevRel creates Cisco API Advisory Group with 10 engineering members

### Education

The Cisco API Style Guide is released between 2018-2019 based on feedback from 20 engineering teams

### Advising

DevRel begins outreach to engineering teams providing guidance based on the Style Guide

## Executive Prioritization

### Exec Alignment

API Quality prioritized in DevRel Strategy. DevRel drove awareness of broadspanning API quality issues, alignment with Engineering leadership to prioritize

### Implementing

Work begins with Cisco API Champions designated across BEs. Cisco API Guidelines (based on the Style Guide) used to drive quality standards.

DevRel API Experience Workshops

2016

2018

2020

2021

2022+

Cisco API Style Guide

Cisco API Guidelines

# Example of how we score across products

Trust



## Highly Reliable

(Lifecycle with deprecation notices, complete & accurate definition, complete changelog)



## Versioned

(API-specific lifecycle, definition published with large coverage, complete changelog)



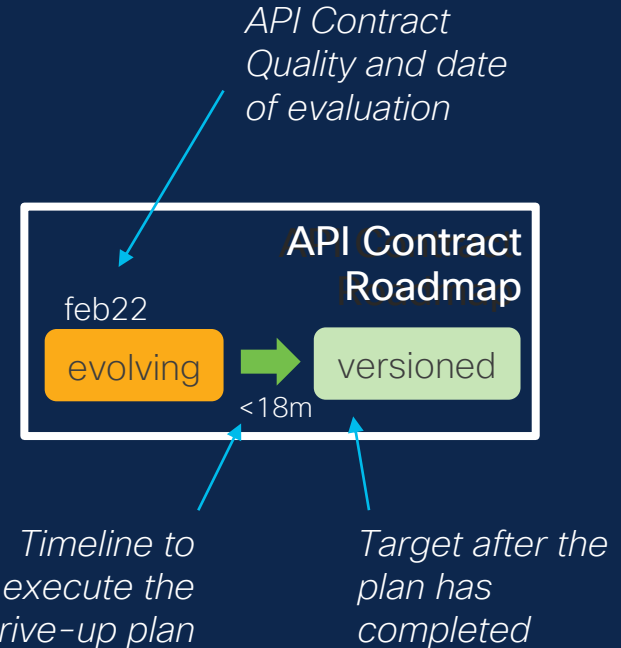
## Evolving

(Product-tied versions, changelogs and contract may not be complete, ie typically UI-led design)



## Unreliable

(Breaking changes, no or partial changelog, typically unstructured or UI-led design)



# Example of how we score across products

## API Contract Report

<Cisco Organization>

API as a Product  
Review Score

API Contract  
Health

API Contract  
Future plans

Design Process

API Definition

Changelog

Versioning

Deprecation  
& EOL notices

Backward  
Compatibility

API Example 1

96

high

versioned

feb22

executing  
→  
<18m

highly  
reliable

API Example 2

48

very low

evolving

feb22

executing  
→  
<18m

versioned

API Example 3

44

very low

evolving

mar22

evaluating  
→  
<18m

versioned

API Example 4

56

low

unreliable

mar22

evaluating  
→  
<18m

evolving

API Example 5

84

medium

versioned

mar22

evaluating  
→

-

# Fill out your session surveys!



Attendees who fill out a minimum of four session surveys and the overall event survey will get **Cisco Live-branded socks** (while supplies last)!



Attendees will also earn 100 points in the **Cisco Live Challenge** for every survey completed.



**These points** help you get on the leaderboard and increase your chances of winning daily and grand prizes



# Continue your education

CISCO *Live!*

- Visit the Cisco Showcase for related demos
- Book your one-on-one Meet the Engineer meeting
- Attend the interactive education with DevNet, Capture the Flag, and Walk-in Labs
- Visit the On-Demand Library for more sessions at [www.CiscoLive.com/on-demand](https://www.CiscoLive.com/on-demand)

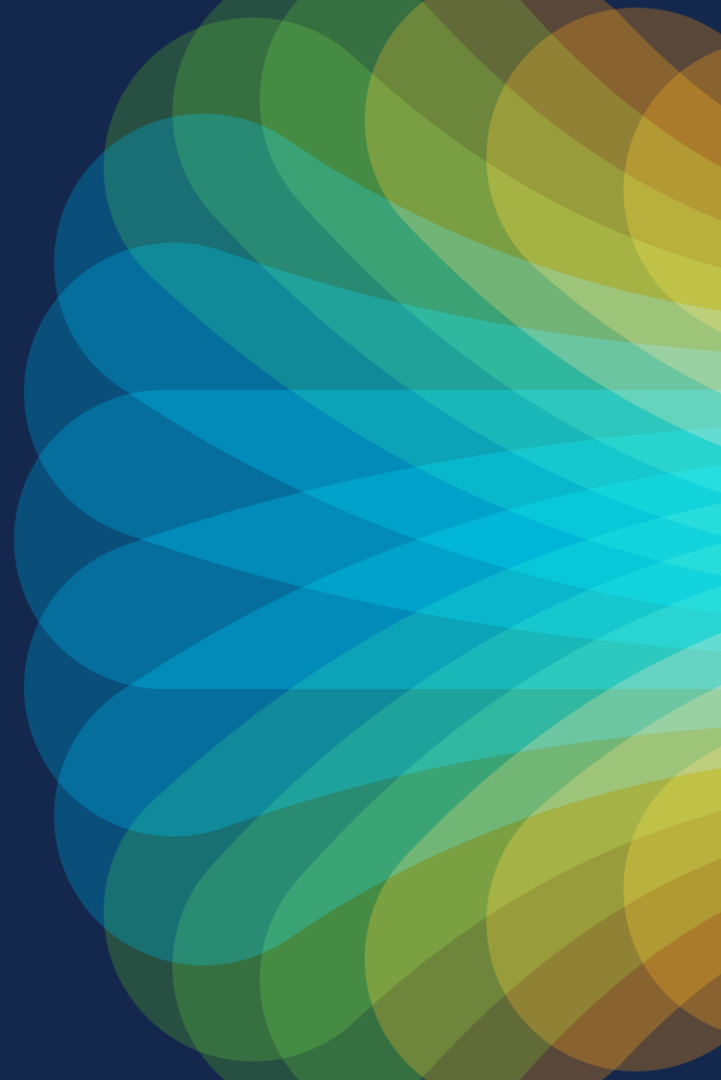


The bridge to possible

# Thank you



#CiscoLive

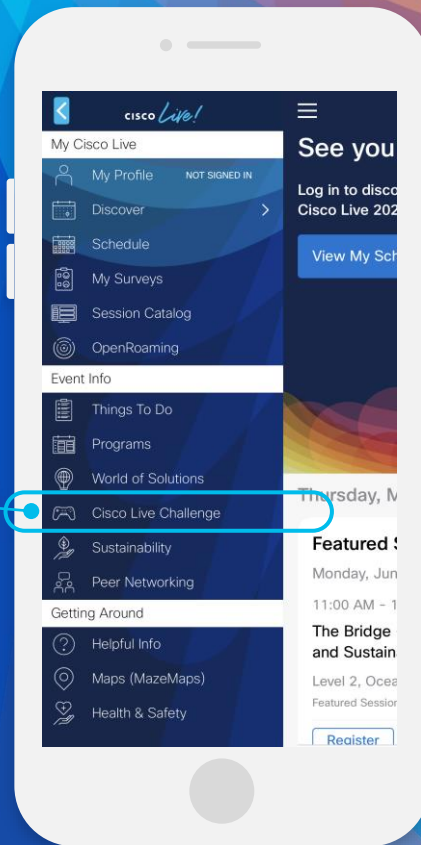
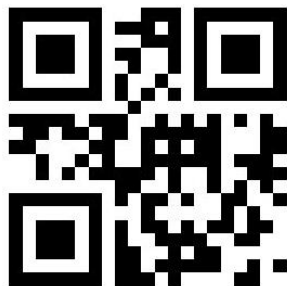


# Cisco Live Challenge

Gamify your Cisco Live experience!  
Get points for attending this session!

## How:

- 1 Open the Cisco Events App.
- 2 Click on 'Cisco Live Challenge' in the side menu.
- 3 Click on View Your Badges at the top.
- 4 Click the + at the bottom of the screen and scan the QR code:





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: yellow, orange, red, pink, purple, blue, and green. Overlaid on this are large, soft, wavy shapes in shades of orange, red, and yellow, giving the impression of clouds or flowing liquid. The overall composition is dynamic and energetic.

cisco *Live!*

Let's go

#CiscoLive