

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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Let's go

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The bridge to possible

# Headaches From YANG Models?

Using YANG Suite to Automate and Validate your  
Journey to Programmability

Troy Perkins – Systems Architect

DEVNET-2628

CISCO *Live!*

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# Cisco Webex App

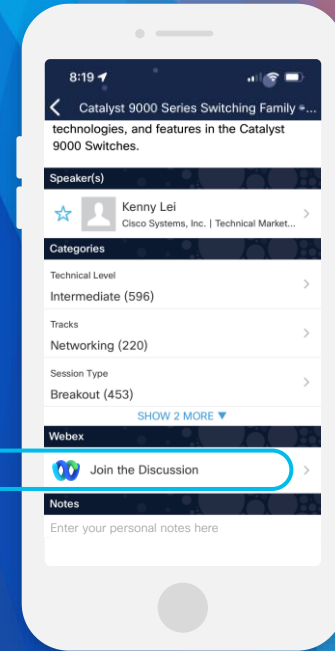
## Questions?

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-2628>

# Agenda

- Introduction
- Model-Driven Programmability
- Cisco YANG Suite
  - Overview
  - Demo
- Conclusion

# Who Am I?

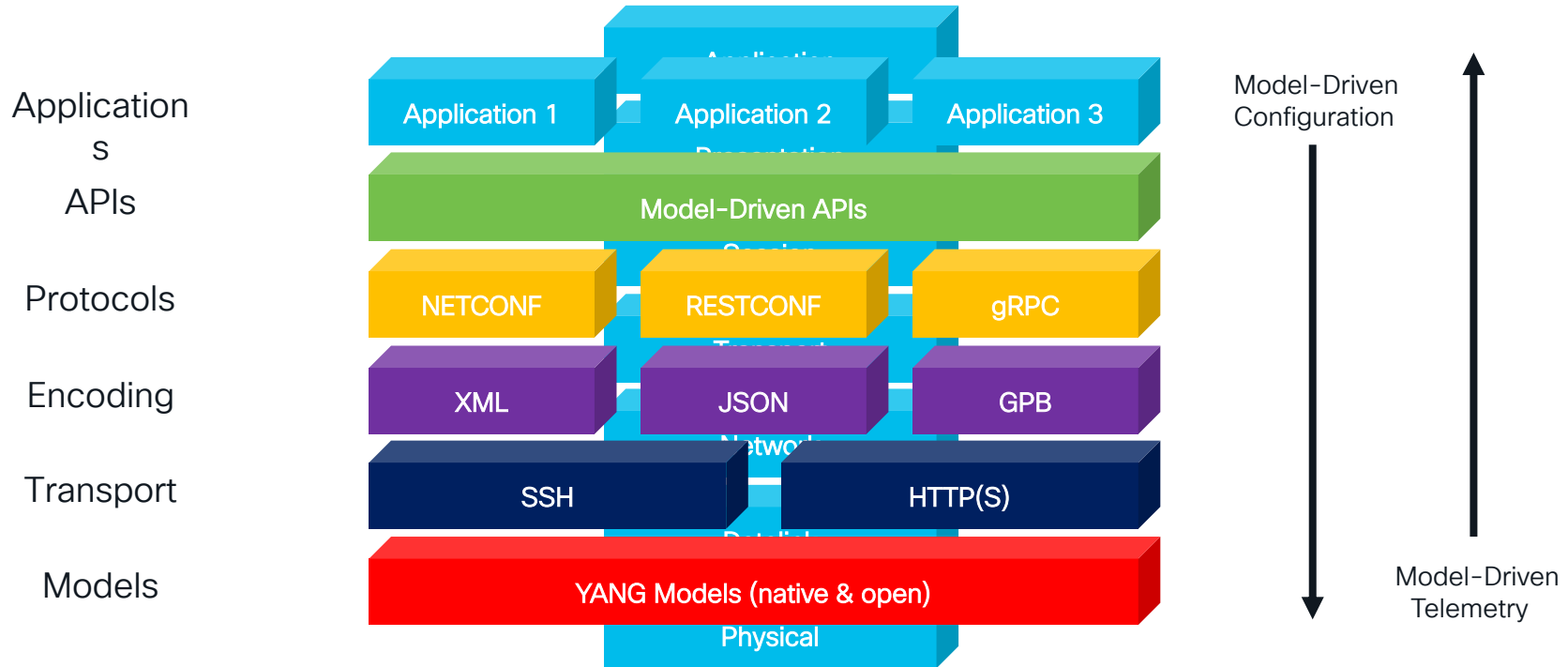


- Career
  - 23+ years in some aspect of Information Technology
  - 8+ years in High Frequency Trading networks
  - 5 years as Systems Architect at Cisco Systems, Inc.
  - 2nd year as Cisco Live speaker
- Focus
  - 14+ years Automation/Programmability
  - Current focus on Model-Driven Programmability

# Model-Driven Programmability

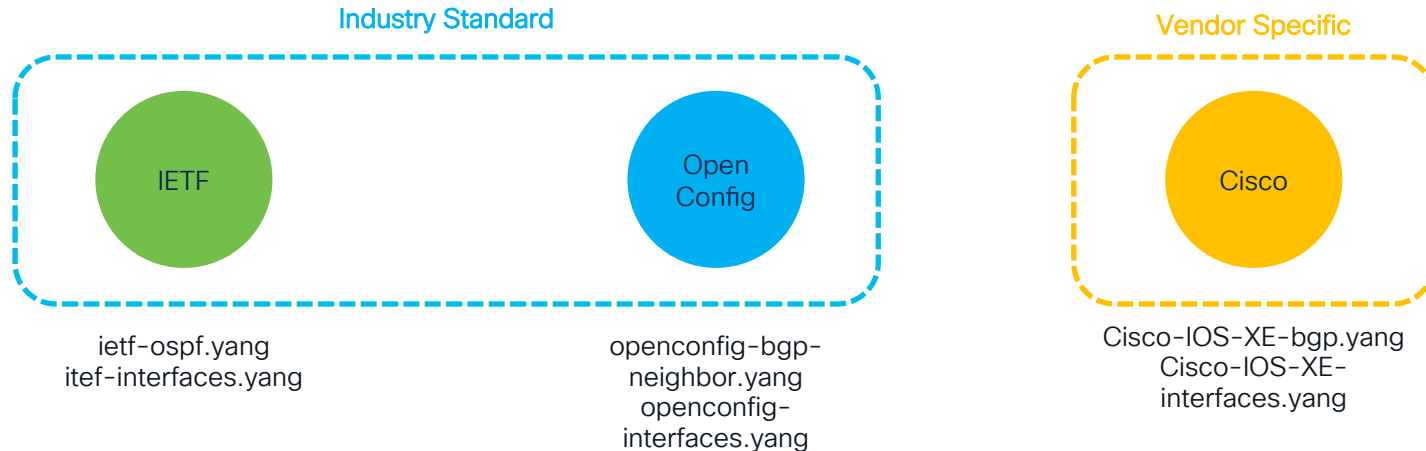


# Model-Driven Programmability Stack



# Data Models and YANG

- Data Models
  - A data-models explicitly and precisely determines the structure, syntax, and semantics of the data which is externally available and visible.
  - Ensures completeness and consistency of interactions between systems and clients.





# What does a YANG model look like?

## Module

```
module: Cisco-IOS-XE-native
```

```
+--rw username* [name]
|   +--rw name                string
|   +--rw privilege?          uint8
|   +--rw view?               string
|   +--rw one-time?           empty
|   +--rw mac?                empty
|   +--rw serial-number?      empty
|   +--rw description?        string
|   +--rw wlan-profile-name?  string
|   +--rw password
|       | +--rw encryption?    enumeration
|       | +--rw password?      string
|   +--rw secret
|       +--rw encryption?      enumeration
|       +--rw secret?          string
```

Leaf/Key

Data Type

```
<native xmlns="http://cisco.com/ns/yang/Cisco-IOS-XE-native">
  <username>
    <name>cisco123</name>
    <secret>
      <secret>test</secret>
    </secret>
  </username>
</native>
```

```
username cisco123 privilege 15 secret
0fc5ec3ed9da5f8802...
```

# What does a YANG model look like?

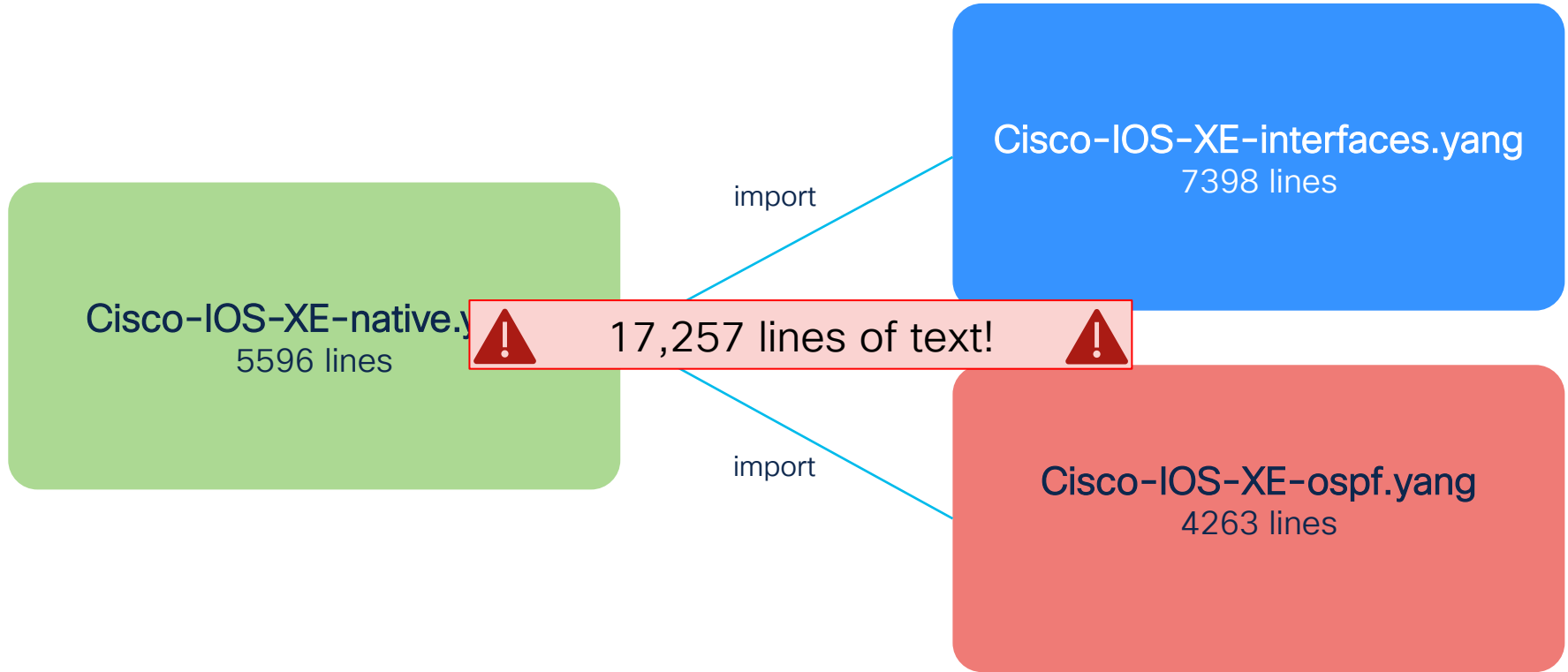
```
<devices>
  <device type="Cisco">
    <ip-addr>10.207.65.52</ip-addr>
    <name>R2</name>
    <payload>
      <config xmlns:xc="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
        <native xmlns="http://cisco.com/ns/yang/Cisco-IOS-XE-native" xmlns:ios-ospf="http://cisco.com/ns/yang/Cisco-IOS-XE-ospf">
          <router>
            <ios-ospf:ospf>
              <ios-ospf:id>1</ios-ospf:id>
              <ios-ospf:network>
                <ios-ospf:ip>2.2.2.2</ios-ospf:ip>
                <ios-ospf:mask>0.0.0.255</ios-ospf:mask>
                <ios-ospf:area>0</ios-ospf:area>
              </ios-ospf:network>
            </ios-ospf:ospf>
          </router>
        </native>
      </config>
    </payload>
  </device>
</devices>
```

YANG-Defined Models

NETCONF Payload

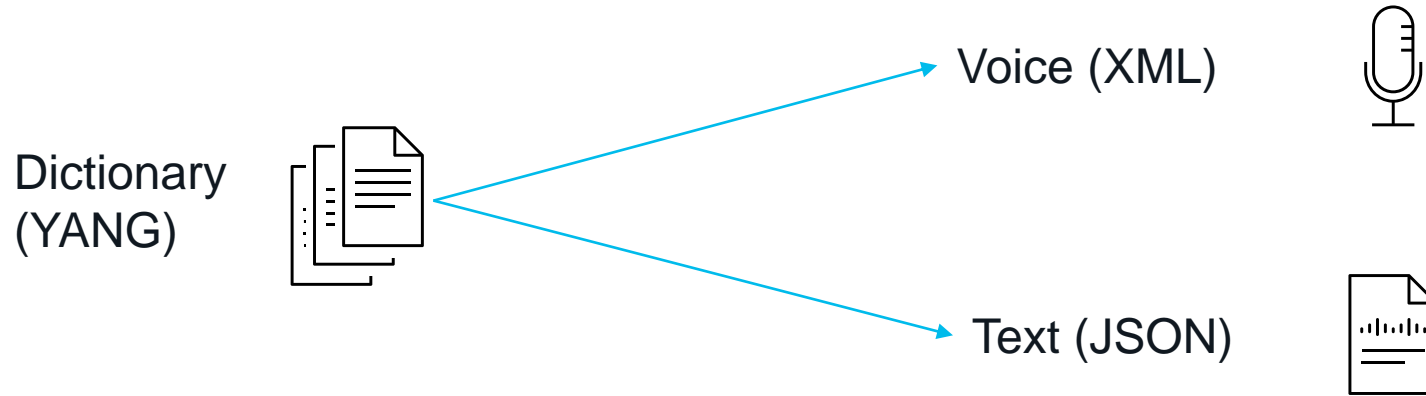
XML Data

# YANG Models Can Be Enormous!



# YANG, XML, or JSON?

- YANG is NOT XML or JSON!
- YANG similar to English language (dictionary)
- XML/JSON are encodings similar to voice or text



# Cisco YANG Suite

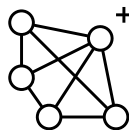


# YANG Suite In Your Network



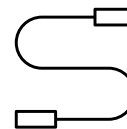
## Learn and Browse

The core components of YANG Suite is an extensible plugin infrastructure used for testing and validating YANG RPCs and payloads.



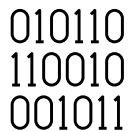
## Interact with Devices

The YANG Suite File Manager works with SCP, Git, NETCONF, or local YANG files.



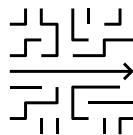
## Migration to YANG

YANG Suite helps with migration from legacy interfaces to YANG.



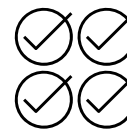
## NETCONF, gNMI & gRPC Telemetry

Interact using NETCONF protocol to network devices using YANG data models and payloads. Receive gRPC Dial-Out Model Driven Telemetry.



## NETCONF, gNMI, and RESTCONF Programmability

Interact using the various protocols to network devices using YANG data models and payloads.



## Datasets and Diffs

The YANG Suite Analytics plugin provides easy transaction of the various metadata in YANG models.

# Demo



# Conclusion

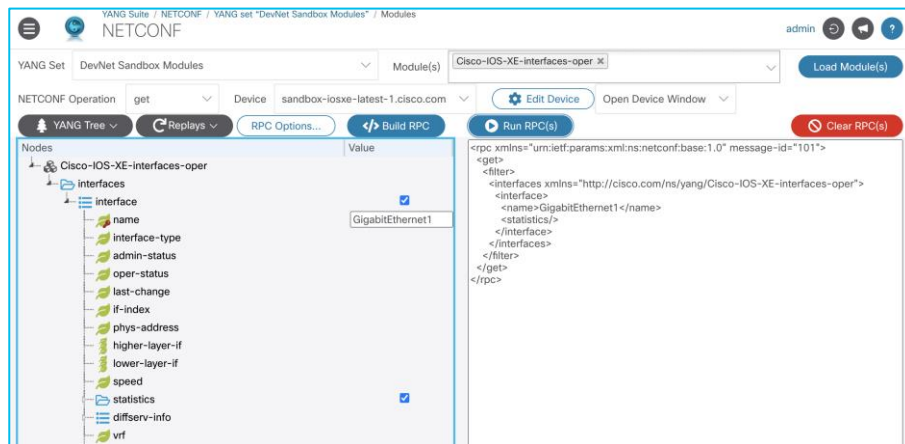




# Resources

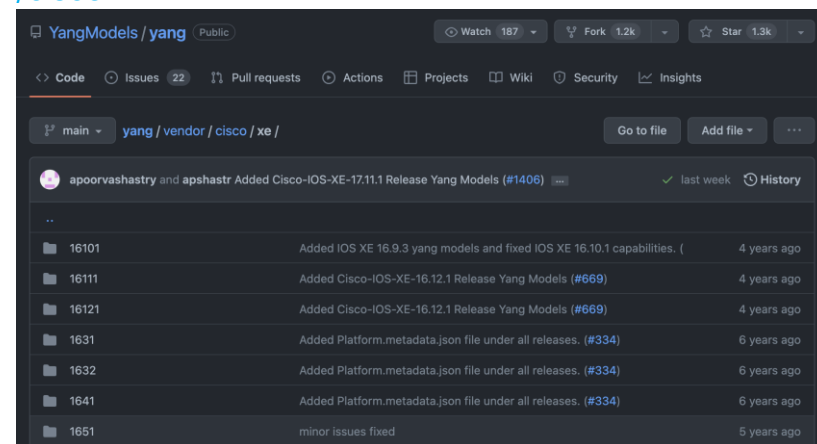
YANG Suite:

<https://github.com/CiscoDevNet/yangsuite>



YANG Models:

<https://github.com/YangModels/yang/tree/master/vendor/cisco>



# Hands on Yangsuite @ Cisco Live

## Research and test YANG models for model driven telemetry on IOS XE with Cisco's YANG Suite – LABCX-2002

- Monday 10:00 a.m – 6:00 p.m.
- Tuesday 10:00 a.m – 5:00 p.m.
- Wednesday 10:00 a.m – 5:00 p.m.
- Thursday 10:00 a.m – 1:00 p.m.

## Hands On Exploration of NETCONF and YANG – DEVWKS-1467

- Wednesday – 4:00 p.m. – 4:45 p.m.

# Fill out your session surveys!



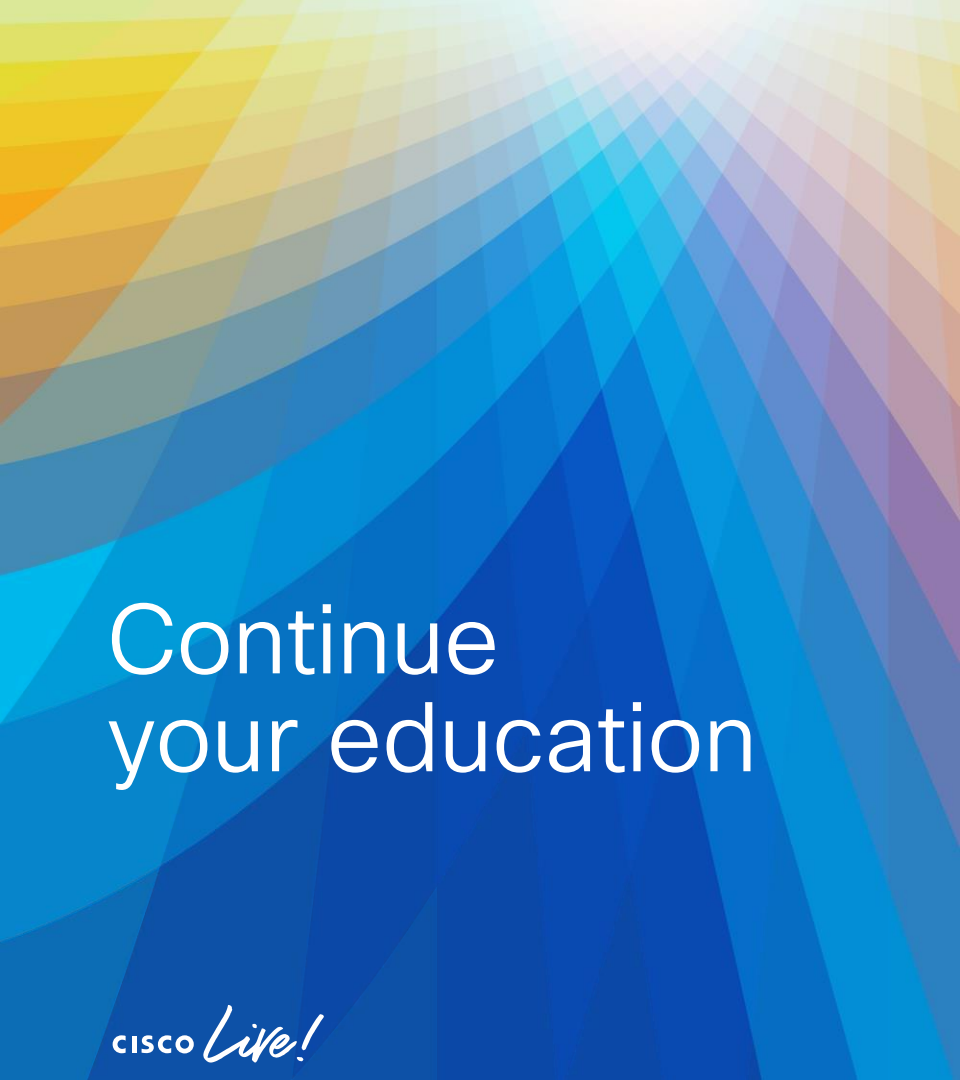
Attendees who fill out a minimum of four session surveys and the overall event survey will get **Cisco Live-branded socks** (while supplies last)!



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

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- 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

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The background of the slide is a vibrant, abstract graphic. It features a series of overlapping, wavy bands of color in shades of red, orange, yellow, green, and blue, creating a sense of movement and energy. On the right side, there is a bright, multi-colored sunburst or starburst effect that radiates outwards, adding to the dynamic feel of the design.

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Let's go

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# 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:

