



The bridge to possible

API Design First

Not Just Another Pretty Interface

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Agenda

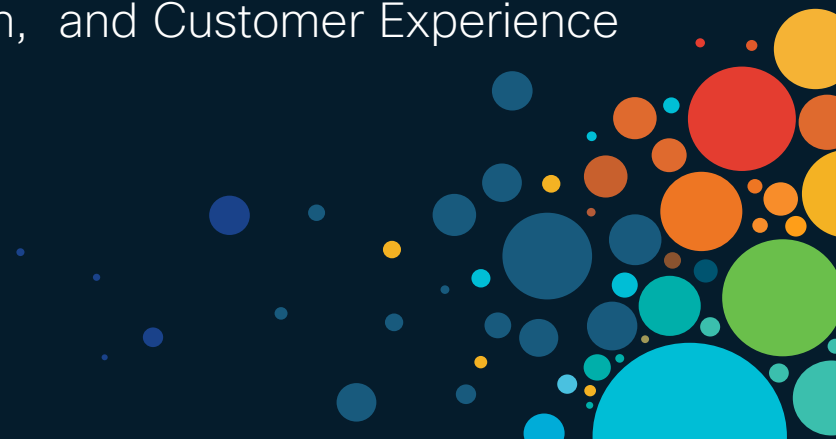
- Why Design APIs?
- OpenAPI Specification
- Design Tools
- Documentation Auto-Generation
- SDK Auto-Generation
- Cisco's API Journey
- API Insights



David Staudt

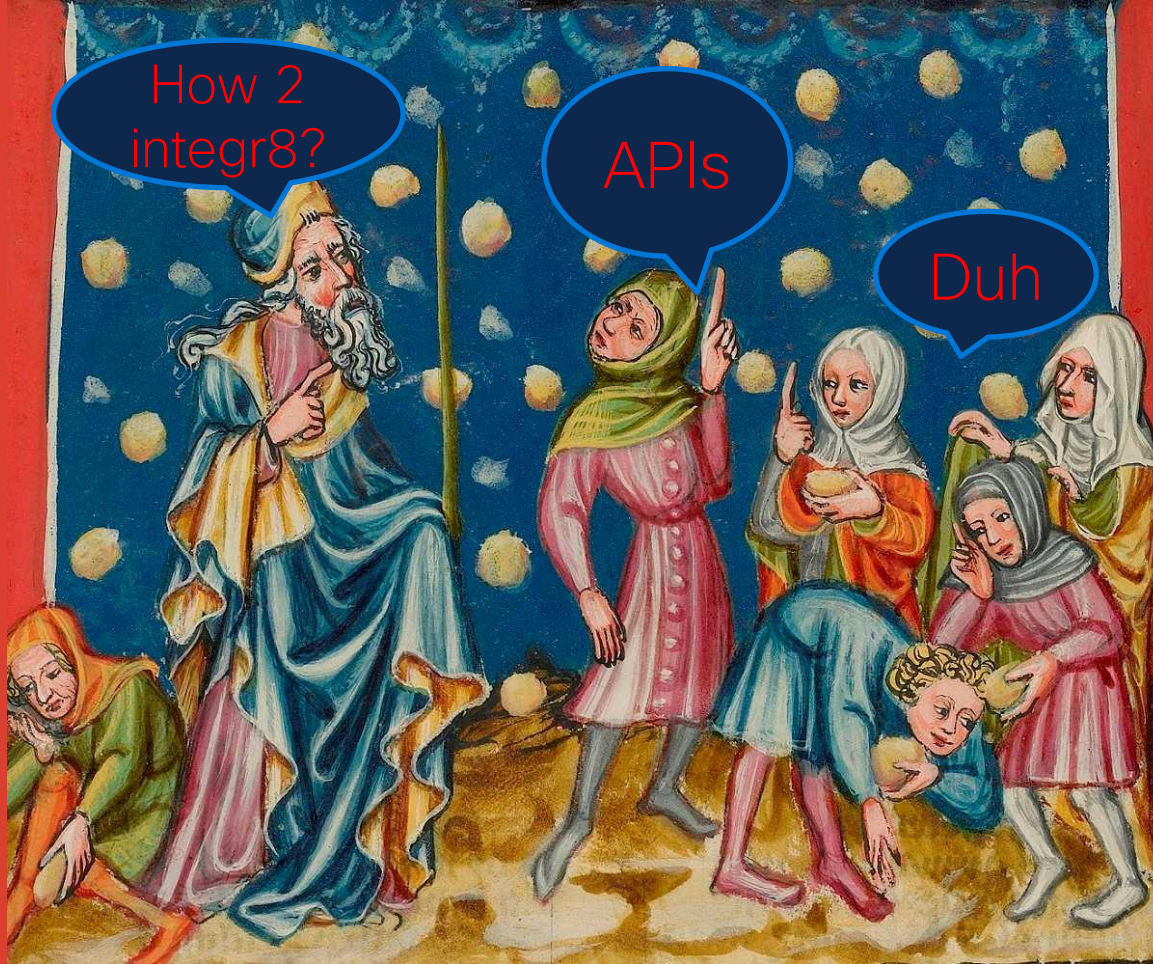
DevNet Developer Advocate, Cisco Systems Inc.

- Supporting and advocating on-behalf-of Cisco API developers for over 20 years
- Covering Cisco Cloud / On-Premise Collaboration, and Customer Experience APIs

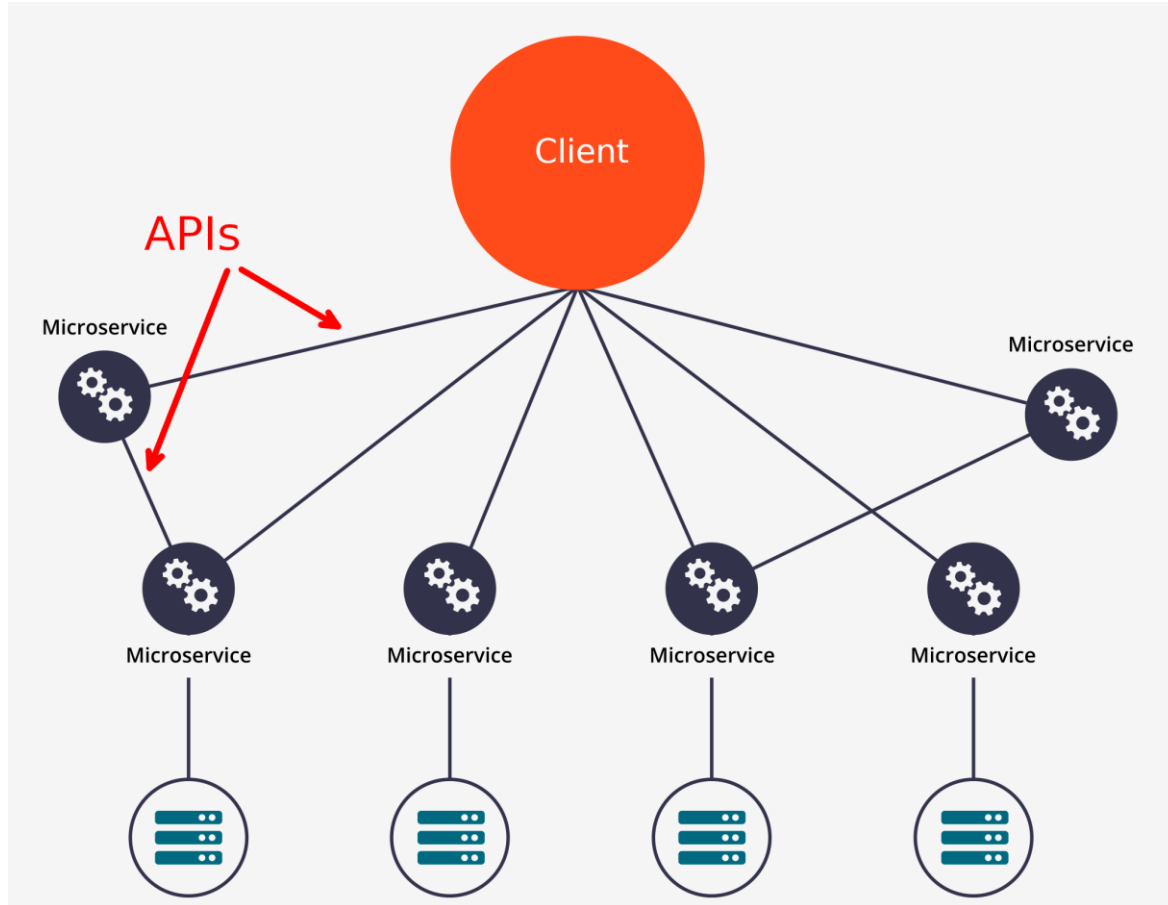


Why Design APIs?





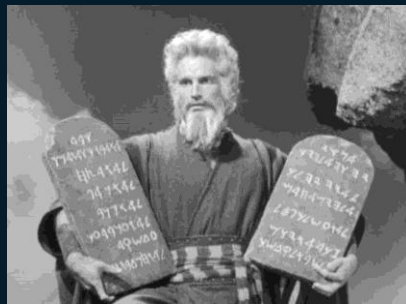
Microservices Architecture



Anonymous –

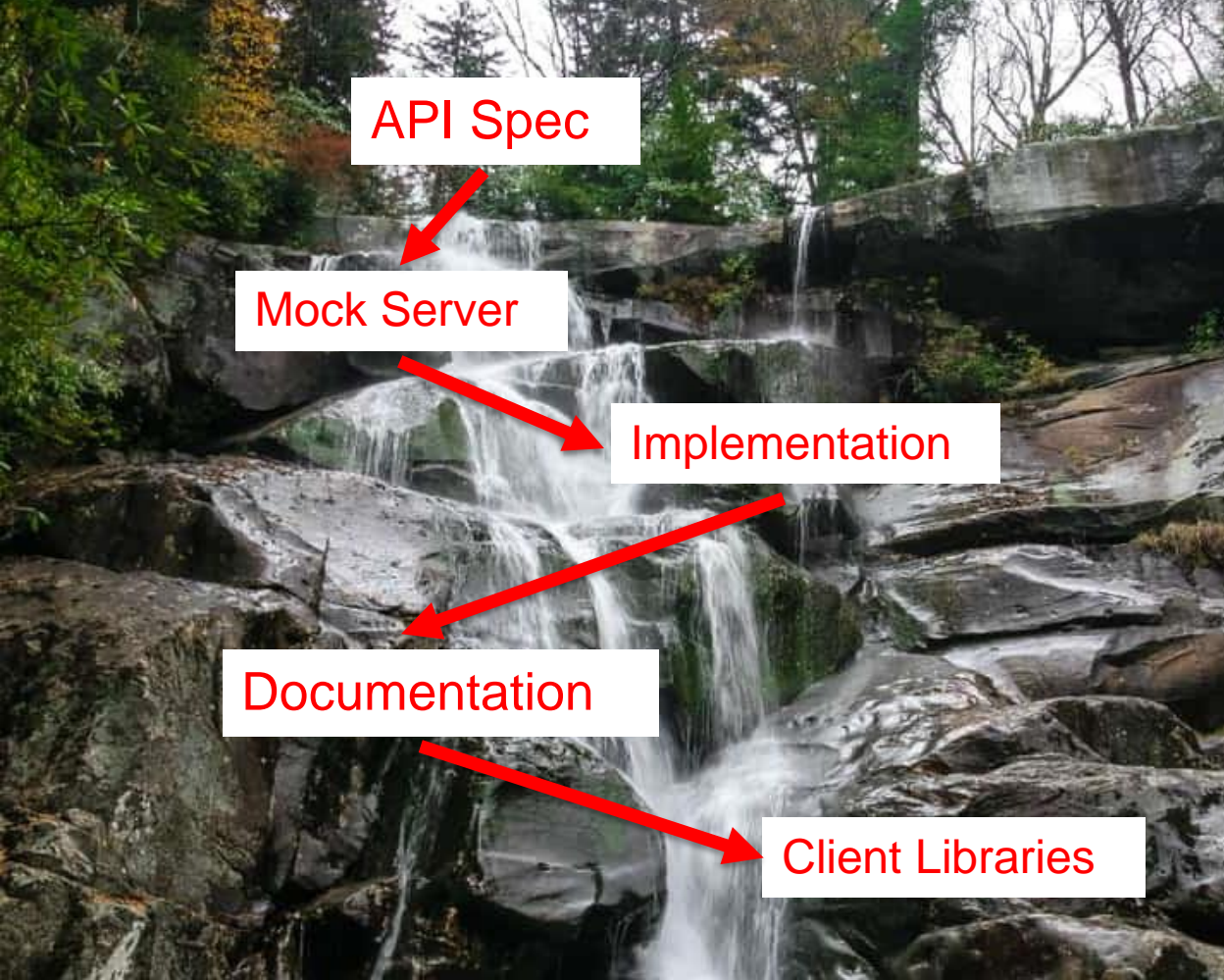
APIs
baby!

- *All teams will henceforth expose their data and functionality through service interfaces.*
- *There will be no other form of interprocess communication allowed: no direct linking, no direct reads of another team's data store, no shared-memory model.*
- *All service interfaces must be designed from the ground up to be externalizable.*
- *Anyone who doesn't do this will be fired.*
- *Thank you; have a nice day!*



Why Design APIs *First?*





The OpenAPI Initiative Charter

<https://www.openapis.org/>



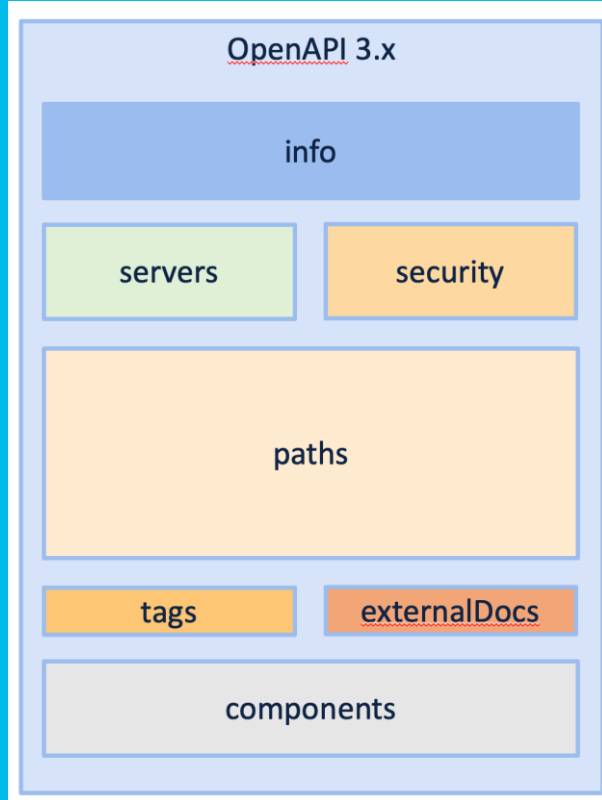
1. Mission of the OpenAPI Initiative

The OpenAPI Initiative (“OAI”) provides an open source community, within which industry participants may easily contribute to building vendor-neutral, portable and open specifications for providing technical metadata for APIs – such as the “OpenAPI Specification” (collectively, “Specifications”) – and supporting tooling for validating the integrity of the specifications or instantiations of it. The OAI is as such not intended to be a destination for community/consumer-focused tooling outside of the specification itself.

2. Membership

- The OpenAPI Initiative shall be composed of:
 - i. corporate members (OAI Members) that have executed an OAI Membership Agreement to sponsor the activities of the OAI Community
 - ii. a Business Governance Board (BGB);
 - iii. an open source, Technical Steering Committee (“TSC”), open to any participant, whether an OAI Member or not; and
 - iv. a Technical Oversight Board (“TOB”).

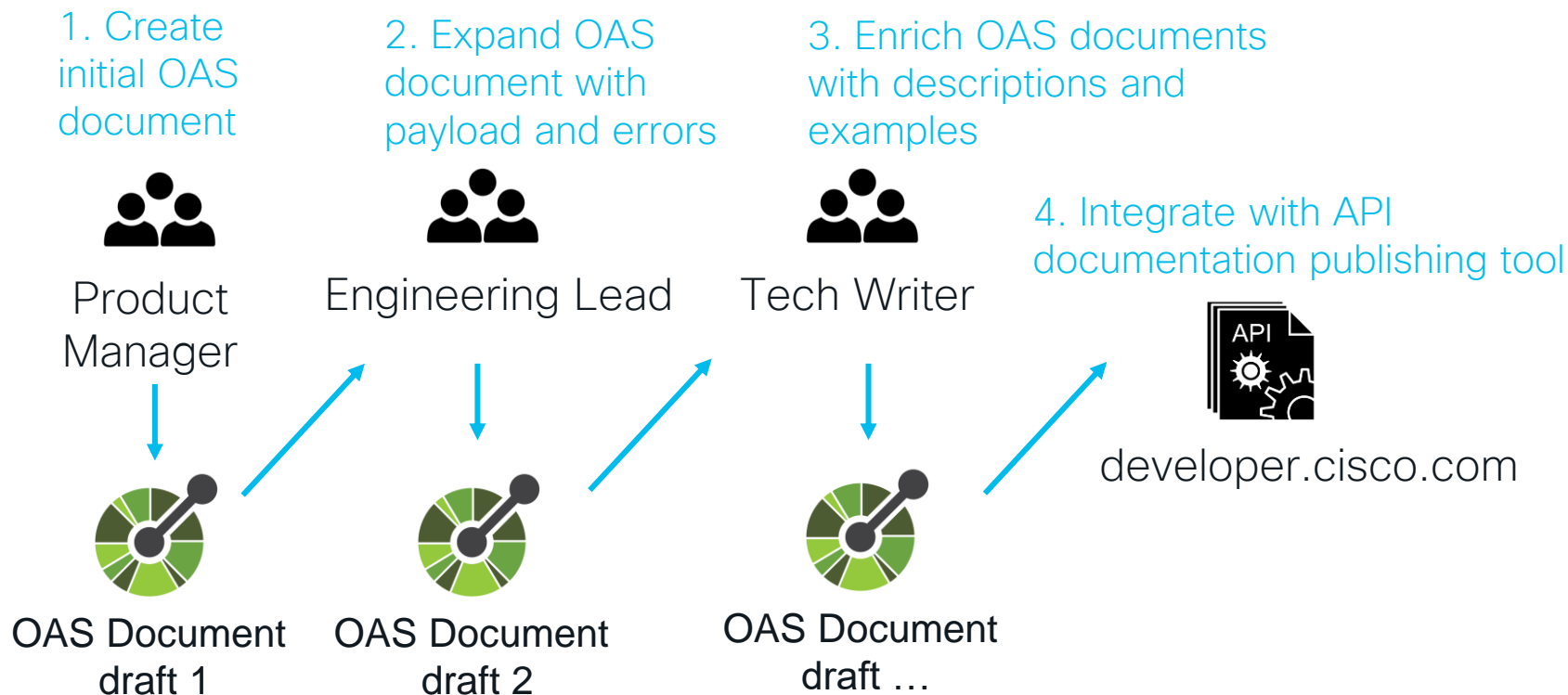
Elements of OAS



- **Info:** Provides details about the API, including a title and description
- **Security:** Specifies authorization. Required for interactive documentation
- **Paths:** What the API can do. Defined by a path + HTTP method (aka verb) + input parameters + one or more response details
- **Components:** Capture reusable elements that may be referenced within and across OAS files. Includes schema, headers, security details

Demo

OAS Document Lifecycle



Cisco's API Journey



Cisco's API Journey

- **Past:** (sometimes wildly) different APIs per team – acquisitions
- **Present:** Focus on REST / OAuth – compile API Guidelines
- **Future:** Consistent APIs / Docs / Tools (the dream)



Cisco's API Quality Journey

Working with Product Engineering Teams

Inception

DevNet 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

DevNet's **API Architect Stève Sfartz** begins outreach to engineering teams providing guidance based on the Style Guide

DevNet API Experience Workshops

2016

2018

2020

Executive Prioritization

Exec Alignment

API Quality prioritized in DevRel Strategy. DevRel drove awareness of broadspanning API quality issues, alignment with ELT Engr 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.

2021

2022

Cisco API Style Guide

Cisco API Guidelines

Cisco's API-First Strategy & Backward Compatibility Efforts

- API-First Strategy
 - Treat it as part of product
 - Versioned releases
 - Changelogs
 - Backwards Compatibility
 - Transparent communication
 - Documentation
 - Support

Backward Compatibility Commitments Announced at Partner Summit

APIs are Backward Compatibility compliant starting now

- Meraki Dashboard API v1
- ISE API v1
- Nexus Cloud API v1
- SecureX Threat Response API v1
- Cloud Security Open APIs v2
- Webex API v1
- PX Cloud API v1

APIs compliant in March 2023

- Cisco Spaces API
- Intersight API
- AppD Cloud APIs

APIs compliant in September 2023

- Cisco DNA Center API
- NSO Northbound API
- ThousandEyes API
- SD-WAN (vManage) API

API compliant in December 2023

- Crosswork CNC API

API Guidelines – Lessons Learned

- **APIs are real products** – plan for serviceability, training, support, management
- **Design deliberately** – simplicity, consistency, loose-coupling, evolve-ability
- **APIs are forever** – invest in making the 1.0 version the only version
- **Developer experience counts** – docs, training, tools, support, management
- **Security/Privacy are ‘must do’** – Guidelines now part of CPDM

API Analytics Tools



Open Source



+

Open Source



API Clarity

+

SaaS



Panoptica

The Cisco Secure
Application Cloud



Application Developer

DevOps

DevSecOps



Key Features

Key Features

Key Features

Static Analysis

API Governance

Language Inclusivity

IDE Extension : VS Code

Dynamic Analysis

Drift

Zombie & Shadow

Spec Reconstruction

Container Scanning

Securing APIs on Kubernetes
Clusters

Internal/External facing API usage

API Policy Enforcement

API Insights – Validate and Score APIs

Compliance
Drift

Analyzing spec v0.0 2
Recalculate

for compliance with
☒ Doc Completeness (Failed)
☒ REST Guidelines
☒ Inclusive Language

3 Error
10 Warning
1 Info
1 Hint




Analyzer	Severity	Findings	Recommendation
security	Error	No maximum number of items defined 4 items affected	Make sure all array definition include the maximum length.
security	Error	No type of the schema defined 2 items affected	Make sure that all object attribute specify a type or a well-defined object schema.
security	Error	Global 'security' field is not defined (Line 0)	Make sure all API operations have a security scheme associated and as a good practice add a global security scheme.
security	Hint	Property value is not an enum that the OpenAPI Specification allows for this property 3 items affected	Make sure the specification is fully valid and in line with the standard for mat.

API Clarity- OAS vs. live traffic observation



API Clarity

3 Error 0 Warning 0 Info 0 Hint

Severity▼	Findings	Recommendation
 Error	General diff: a general diff has been detected 28 items affected ▼	Please update the spec accordingly.
 Error	Shadow: an undocumented API has been detected 11 items affected ▼	Please add the API in the spec.
 Error	Zombie: a deprecated API has been detected 11 items affected ▼	Please update clients to stop using deprecated APIs.

www.apiclarify.io

O



Panoptica – Cloud-native application security

INTERNAL APIS				EXTERNAL APIS				TOKENS			
Destination Service				Policy compliance				Clusters & Namespaces			
<input type="text"/>				Select...				Select...			
DESTINATION SERVICE	PORT	CLUSTER	NAMESPACE	SECURITY FINDINGS ▲						CLIENT WORKLOADS	TEST
front-end	443	Sock Shop	sock-shop	Total: 166	7	5	132	1	21	kong	● Test-rea
user	80	Sock Shop	sock-shop	Total: 164	7	4	131	1	21	front-end	● Test-rea
catalogue	80	Sock Shop	sock-shop	Total: 83	4	9	56	3	11	front-end	● Test-rea
carts	80	Sock Shop	sock-shop	Total: 69	4	7	44	1	13	front-end	● Comple
mongodb	3035	Finance	finance	Total: 0	0	0	0	0	0	billing api-gateway	● Not enal
billing-stage	3035	Finance	finance	Total: 0	0	0	0	0	0	billing api-gateway	● Not enal

www.panoptica.app

Links & Resources

- [Open API Specification](#)
- [Swagger Editor](#)
- [Swagger UI \(docs\)](#)
- [Swagger Codegen](#)
- [API Stylebook](#) (collection of API style guides)

Cisco Webex App

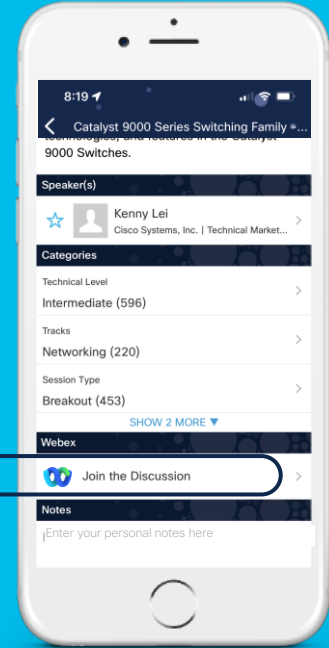
Questions?

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 until February 24, 2023.



<https://ciscolive.ciscoevents.com/ciscolivebot/#BRKDCN-2480a>

Complete your Session Survey

- Please complete your session survey after each session. Your feedback is very important.
- Complete a minimum of 4 session surveys and the Overall Conference survey (open from Thursday) to receive your Cisco Live t-shirt.
- All surveys can be taken in the Cisco Events Mobile App or by logging in to the Session Catalog and clicking the "Attendee Dashboard" at <https://www.ciscolive.com/emea/learn/sessions/session-catalog.html>



Continue Your Education



Visit the Cisco Showcase for related demos.



Book your one-on-one Meet the Engineer meeting.



Attend any of the related sessions at the DevNet, Capture the Flag, and Walk-in Labs zones.



Visit the On-Demand Library for more sessions at ciscolive.com/on-demand.



The bridge to possible

Thank you

CISCO *Live!*

