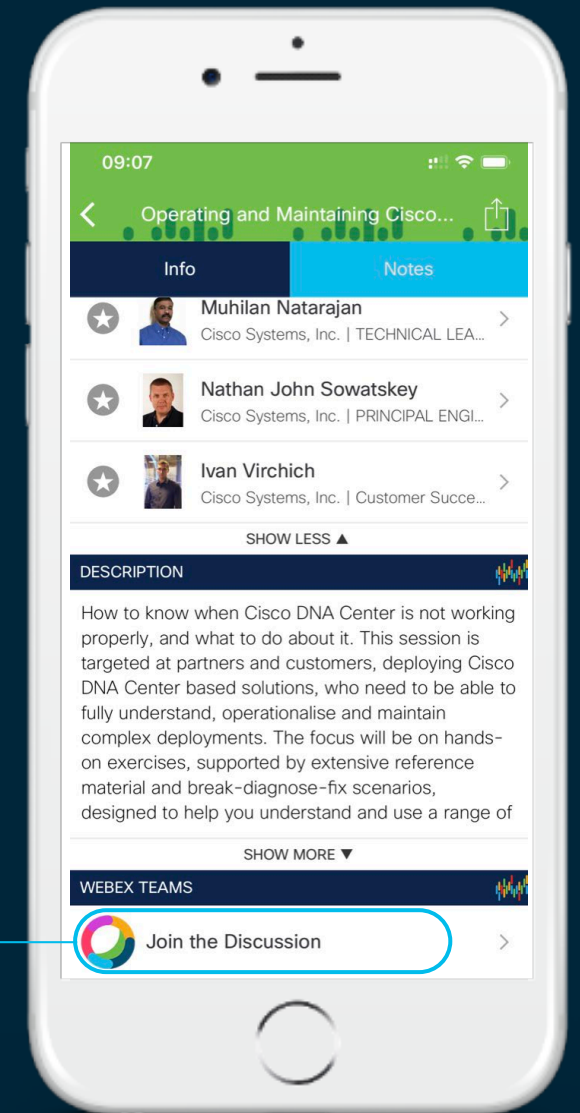# Cisco Webex Teams

Questions?
Use Cisco Webex Teams to chat
with the speaker after the session

How

1. Find this session in the Cisco Events Mobile App

2. Click "Join the Discussion"

3. Install Webex Teams or go directly to the team space

4. Enter messages/questions in the team space

Agenda

- What is Cisco NSO and why is it AWESOME for network automation?

- Where to get Cisco NSO today for free, and how to install it

- Connecting to your existing network and "learning" the current state

- Exploring your network through Cisco NSO

- Some Network Automation Minimum Viable Use Cases

- Joining the NSO Community and What to do next!

Lab Guide

What is Cisco NSO?

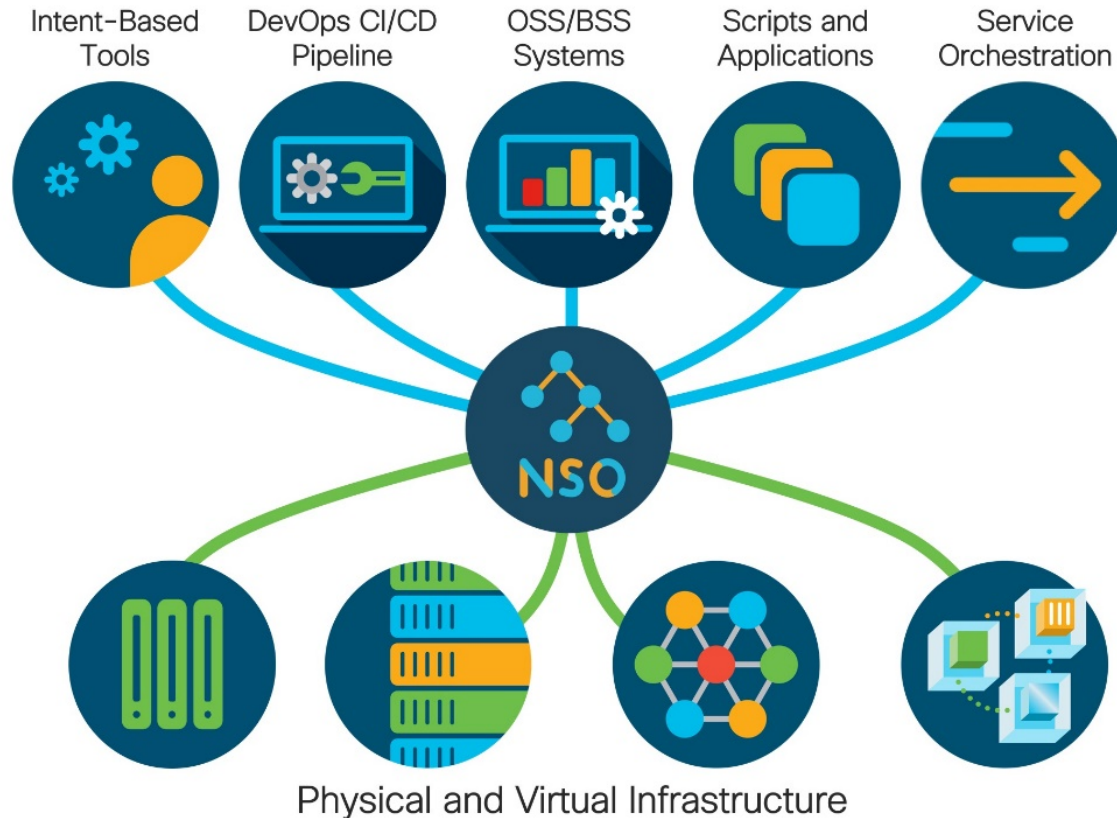# NSO will help a lot now, and even more later

Today:
Network CLI

- Immediate benefits with familiar approach
- 2 fully functional CLI options
- Strict separation of operational and config data
- Perform operations on groups of devices
- Full AAA integration
- Database-style two-phase commit on changes

Tomorrow:
Network API

- Adopt over time as comfort and skills grow
- Python is a good place to start
- Multiple language bindings available
- Eventually integrate your own toolchain

Cisco NSO is a bridge

Intent-Based Tools · DevOps CI/CD Pipeline · OSS/BSS Systems · Scripts and Applications · Service Orchestration

NSO

Physical and Virtual Infrastructure
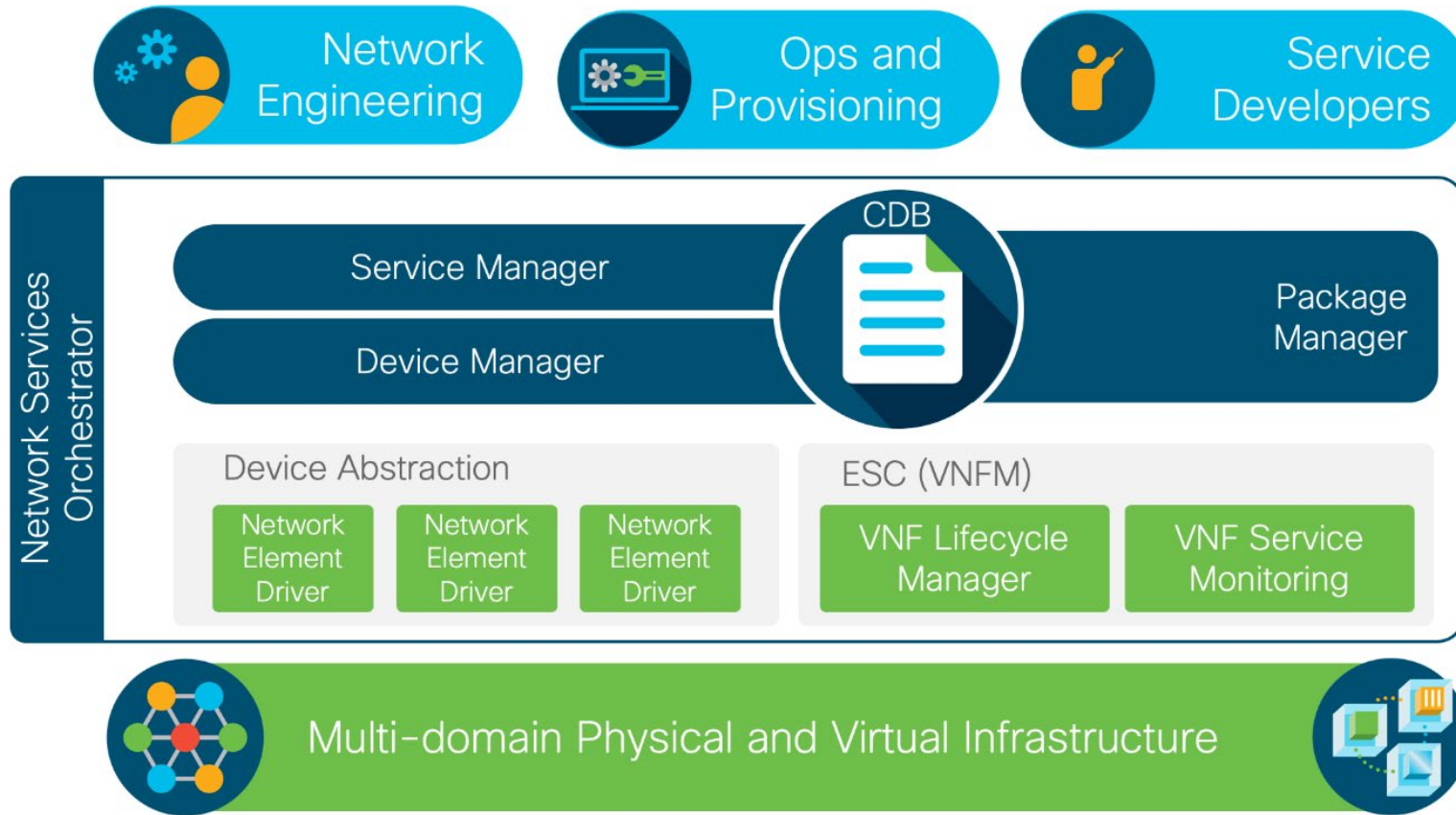
Between people that build services and ones that operate infrastructure

Across different domains and vendors

Over both physical and virtual infrastructure

NSO Architecture

- Multivendor abstraction through NEDs
- Single datastore for all network elements under management
- Multiple interfaces including CLI, REST, Java Python
- Templates and compliance reporting

Industry's broadest multivendor support

Over 170 NEDs and growing – custom NEDs available

Getting and Installing NSO

Getting NSO Files

- Available FREE on DevNet for non-production use
  - https://developer.cisco.com/docs/nso/#!getting-nso
- What you'll get
  - NSO installation file for Mac or Linux
  - Latest NEDs for Cisco platforms

Local vs System Installation

- **System Install** is used when installing NSO for a centralized, "always-on", production grade purpose.

- **Local Install** is used for development, lab, and evaluation purposes. It unpacks all the application components, including docs and examples, and allows the user to instantiate and start instances of NSO on demand.
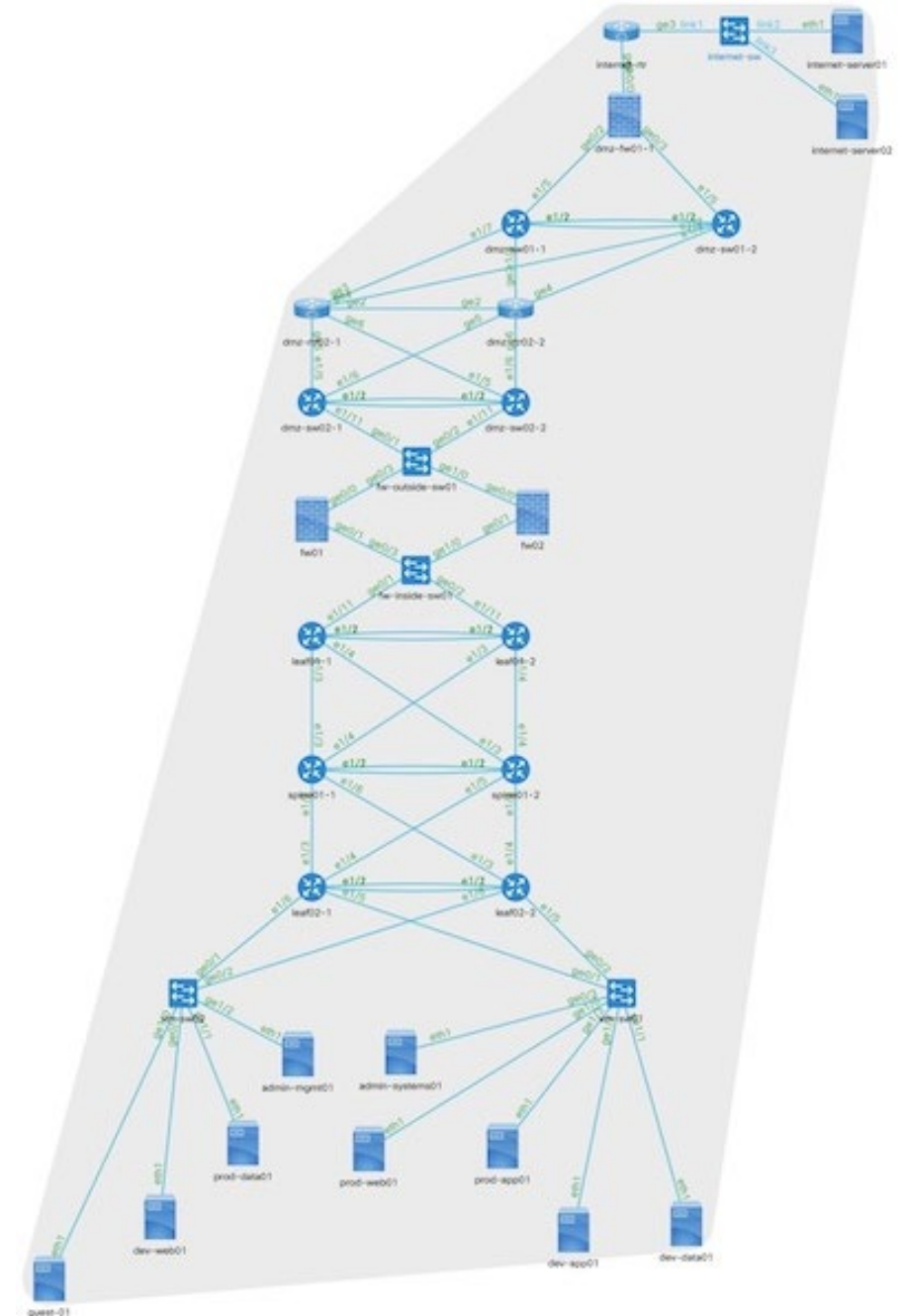
Installation Demonstration

cisco Live!

Connecting NSO to Your Network

What Network?

- Lab includes a VIRL topology
  - Nexus Data Center network – vlans and VPC
  - ASA Firewalls at DC Edge
  - IOS XE routers within "DMZ"
  - Simulated "Internet" with Clients
  - Already configured and functional
- Run this network for free with DevNet Sandbox
  - http://cs.co/sbx-multi
  - Setup Instructions

Steps to Setup NSO Instance

- Use ncs-setup to prepare a new instance of NSO
  - Similar to setting up a Python venv
- Start local NSO instance
- Configure Device Authentication
- Add Devices to NSO
- Pulling current config to NSO with sync-from

Network Connection Demonstration

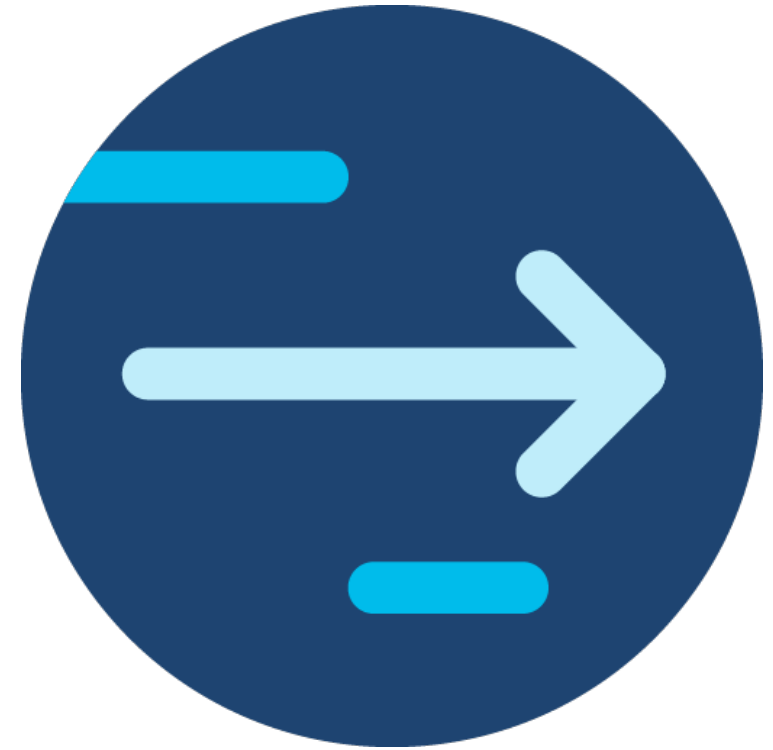https://github.com/hpreston/nso-getting-started/blob/master/02-connecting-to-network.md#setting-up-and-starting-nso

Exploring Cisco NSO

What can you do with NSO right away?

- Centrally work with device configurations

- Build configuration templates

- View "operational state" for your entire network

Basic NSO Features Demonstration

https://github.com/hpreston/nso-getting-started/blob/master/03-exploring-with-cli.md

Network Automation Minimal Viable Use Cases

Minimal Viable Use Case

An actually useful use case for network automation that is appropriate for engineers to tackle with a new tool or when starting out their journey.

Should be
- Safe – no impact to ability of network to process traffic
- Tied to time consuming action for network engineers or operators

Example Minimal Viable Use Cases

- Gathering the MAC addresses from across the network

- Verifying Network Configuration Compliance

- Updating SNMP Community Strings Across the Network

MVU Demo: Gather MAC Addresses

https://github.com/hpreston/nso-getting-started/blob/master/04b-mvu.md

MVU Demo: Configuration Compliance

https://github.com/hpreston/nso-getting-started/blob/master/04c-mvu.md

MVU Demo: SNMP Community Strings

https://github.com/hpreston/nso-getting-started/blob/master/04a-mvu.md

What's Next?

Goals of Automation Change Over Time...

Today's Session

Task Automation
- Single box, simple task
- Ex: Port Turnup
- Scope: Single team
- Trigger: Manual
- Metric: Successful Completion

Domain Automation
- Multi-box, Multi-vendor, single domain
- Ex: L3VPN provisioning
- Scope: Single team
- Trigger: Domain-specific tooling
- Metric: Efficiency

Business Automation
- Automate full business processes
- Scope: Tech and LoB teams
- Ex: Auto-scaling services
- Trigger: Business process toolchain
- Metric: Flexibility

Time >

Device Automation
- Single box, complex task
- Ex: ZTP
- Scope: Single team
- Trigger: Manual
- Metric: Completion

Cross-Domain Automation
- Ex: Multi-Layer IP+Optical
- Scope: Multiple concurrent teams
- Trigger: Workflow tool chain
- Metric: Speed

NSO can grow with you!

NSO is part of your automation ecosystem

Learn more about NSO

cisco.com/nso — More info on NSO and the ecosystem

developer.cisco.com/nso — Download a free copy of NSO and get access to developer resources

NSO Developer Hub — NSO community for developers and users

Run through today's exercises yourself!

- DevNet Sandbox and Cisco VIRL provides the sample network

- Download Cisco NSO for FREE from DevNet!

- Guided instructions from installation through use cases and to cleanup

NSO 101: Your first afternoon

These labs will help you go from zero to NSO hero.

1. Learn how to install NSO
2. Connect NSO to your network
3. Explore the NSO CLI
4. Cleaning Up Your Environment

Minimum Viable Use Cases

Here are a few example real-world use cases that every network engineer can relate to solved with NSO.

1. Gather the MAC Addresses from the Network
2. Verify Network Configuration Compliance
3. Update SNMP Community Strings Across the Network

Learn more about the new DevNet Certifications and how you can prepare now!

Associate Level	Specialist Level	Professional Level	Expert Level

Engineering

CISCO CERTIFIED CCNA — CISCO CERTIFIED SPECIALIST — CISCO CERTIFIED CCNP — CISCO CERTIFIED CCIE

Software

CISCO CERTIFIED DEVNET Associate — CISCO CERTIFIED DEVNET SPECIALIST — CISCO CERTIFIED DEVNET Professional — CISCO CERTIFIED DEVNET Expert (Future Offering)

Start Here | Upcoming Cisco DevNet Certifications

- Start at **Meet DevNet**

  DEVNET-2864: Getting ready for Cisco DevNet Certifications
  Offered daily at 9am, 1pm & 4pm at Meet DevNet
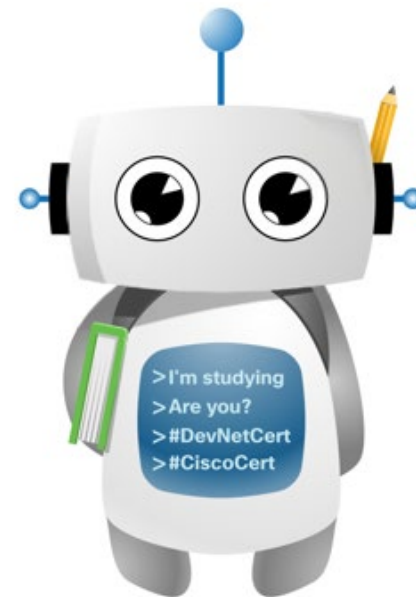
- Attend a **brownbag session**

  DEVNET-4099: DevNet Certifications: Bringing software practices & software skills to networking
  Offered daily 12:15-12:45 in the DevNet Zone Theater

- Visit the **Learning@Cisco** booth

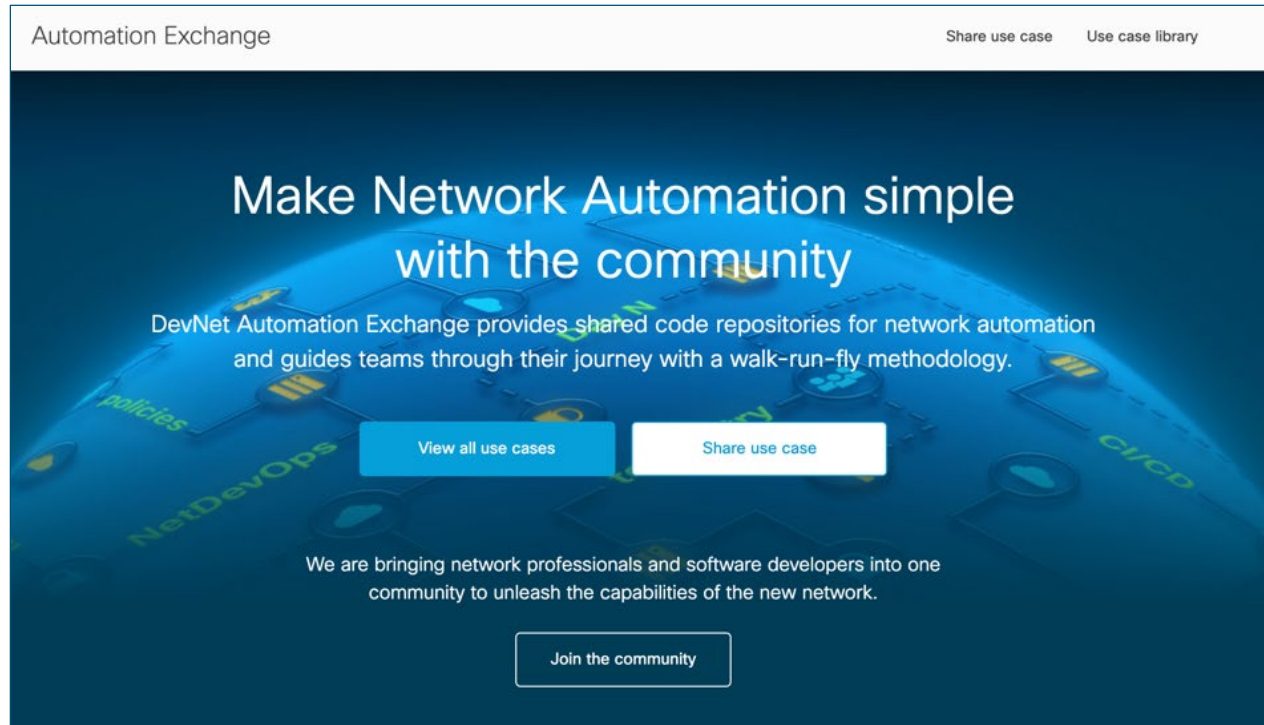- Scan this code to **sign up** for the latest updates or go to
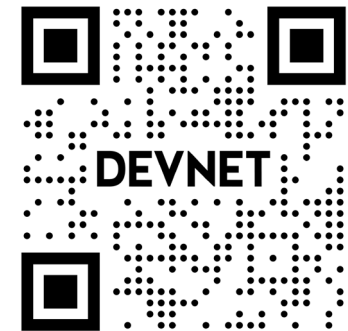 http://cs.co/20eur02

Find shared code repositories of use cases for network automation & more

Don't miss our 5 **Automate Infrastructure** demos in the DevNet Zone!

Scan this code or go to the URL to **learn more**

http://cs.co/20eur01

Start at **Meet DevNet**

DEVNET-3010 [a-j] Learn how to make Network Automation Simple with the Community

Offered Monday 2pm & 5pm, Tuesday & Wednesday 10am, 2pm & 5pm, and Thursday 10am & 5pm at Meet DevNet

Got more questions? Stay in touch!

Hank Preston

hapresto@cisco.com

@hfpreston

http://github.com/hpreston

developer.cisco.com

@CiscoDevNet

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http://github.com/CiscoDevNet

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- 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 (starting on Thursday) to receive your Cisco Live t-shirt.

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Thank you

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