Proaktivní monitoring na míru

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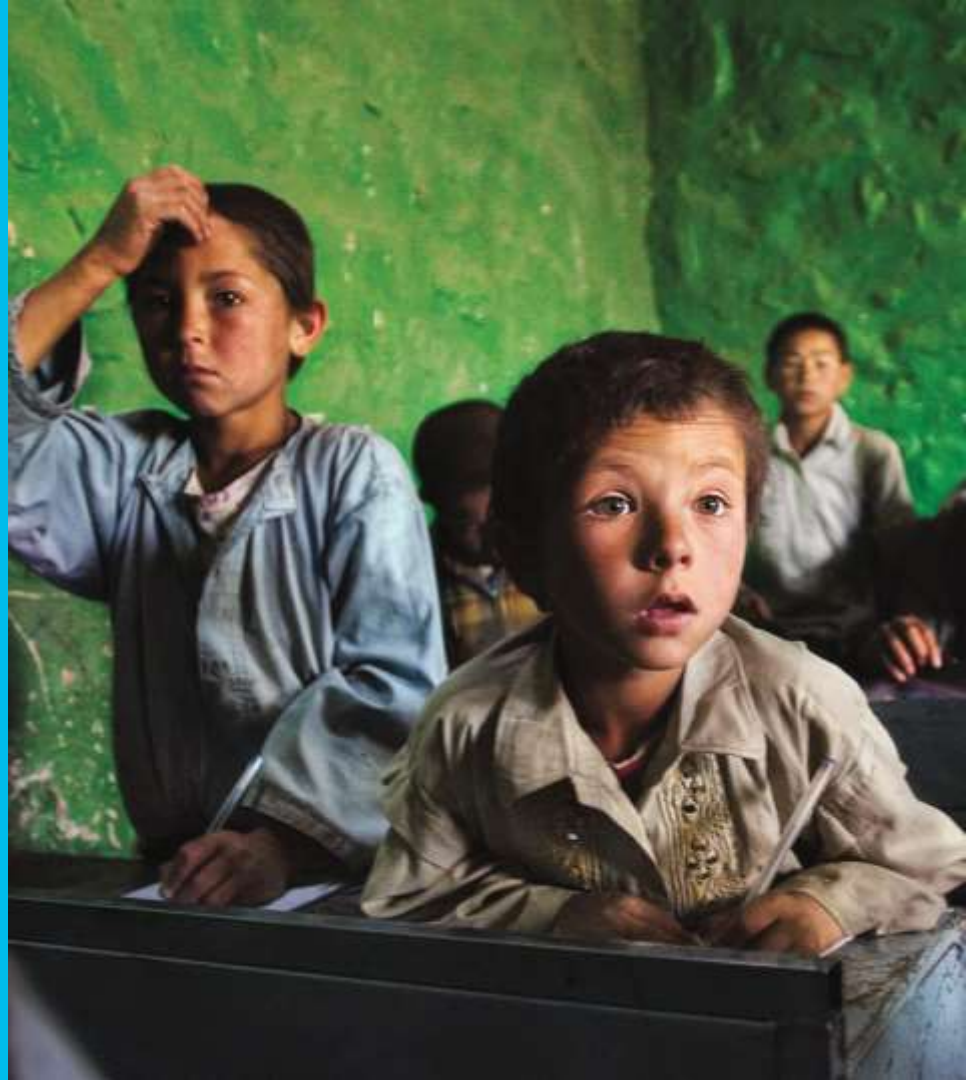
2021

Product Updates



New Cisco Catalyst 9100 Series Access Points

Purpose built for Wi-Fi 6

Ideal for small to medium deployments

9105AX

- 2x2 + 2x2
- MU-MIMO, OFDMA
- Spectrum Intelligence
- IoT ready
- 1 x 2.5 mGig (WP)

9115AX

- 4x4 + 4x4
- MU-MIMO, OFDMA (only DL)
- Spectrum intelligence
- 1 x 5 mGig

Mission critical

Powered by Cisco RF ASIC

9120AX

- 4x4 + 4x4
- Cisco RF ASIC
- Dual 5GHz, HDX
- IoT ready
- Application Hosting
- 1 x 2.5 mGig

Best in Class

Powered by Cisco RF ASIC

9130AX

- 8x8 + 4x4 or 4x4 + 4x4 + 4x4
- Tri-radio (Dual 5GHz + 2.4GHz)
- Cisco RF ASIC
- Decrypted data packet iCAP
- IoT ready
- Application Hosting
- 8 port Smart Antennas
- 1 x 5 mGig

Cisco DNA Assurance with iCAP | Bluetooth 5 | USB | Integrated or external antenna SKUs

Cisco Catalyst 9124 Series Access Points

Cisco® Catalyst® 9124AX

Best-in-class Wi-Fi 6 technology

Powered by Cisco RF ASIC

Platform

- Internal omnidirectional, internal directional, and external antenna options

Scale and performance

- 4x4 + 4x4 (I/D/E)
- 2.5G mGig (PoE-In), SFP uplink, and 1G PoE-Out
- MU-MIMO and downlink/uplink OFDMA
- Cisco RF ASIC for next-gen Cisco CleanAir®

Integrated security

- WPA3, trustworthy systems
- Multilingual AP with BLE, Thread

Intelligent

- Client analytics to enhance Cisco DNA Assurance

Next-generation wireless infrastructure for any scale

Cisco Catalyst 9800 Embedded Wireless*
100 APs, 2000 clients

Cisco Catalyst 9800 Embedded Wireless (SDA)
200 APs, 4000 clients

Cisco Catalyst 9800-L
250 APs, 5000 clients,
5 Gbps

Cisco ENCS

Cisco Catalyst 9800-40
2000 APs, 32,000 clients,
40 Gbps

Cisco Catalyst 9800-CL***
1000 APs, 10,000 clients

Cisco Catalyst 9800-80
6000 APs, 64,000
clients, 80 Gbps

Google Drive

Amazon Web Service

KVM VMware

Cisco Catalyst 9800-CL
1000, 3000, or 6000 APs
10,000, 32,000 or 64,000 clients

*Supports Cisco FlexConnect® local switching only

**SD-Access only

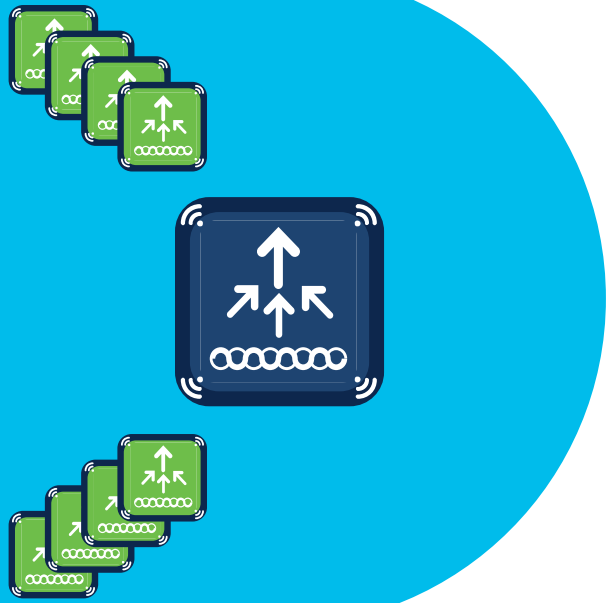
***Cisco Catalyst 9800 for public cloud: Cisco FlexConnect only

Up to 100 APs | Up to 250 APs | Up to 1000 APs | Up to 3000 APs | Up to 6000 APs

Small campus and branch | Medium-sized campus | Large campus

Cisco Embedded Wireless Controller on Catalyst 9100 Access Points

Modern, open and programmable Wi-Fi solution supporting enterprise features



Simple

Dashboard or Mobile-App to deploy, manage and monitor

Flexible

License-free* for up to 100 APs when using Dashboard/Mobile App

Easy migration to an appliance or cloud-based controller

Secure

Enterprise class security & resiliency features keep the network running and protected

*Use DNA Opt-Out when ordering EWC APs.
DNA License required when connecting to DNA center and/or WLC

EWC ready for enterprise branch deployments

Simple

Simplified WebUI for monitoring, provisioning, and day-N operations

<10 seconds

Active to standby switchover in a few seconds

SMU (patching) support for both controller and access point

Secure

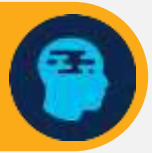
aWIPS,* rogue detection, identification, and **mitigation**

Walled garden and DNS blocking

Cisco Umbrella

Cloud-delivered enterprise security with Cisco Umbrella*

Flexible



Redundancy with active and standby controllers running simultaneously on two access points

Cisco DNA Center Plug and Play (PnP), Automation, and Assurance

Open standards-based programmability with NETCONF and YANG

* Cisco IOS XE 17.1.

Catalyst 9300X- Stackable 10/25G Fiber Switch

X86 CPU
with **crypto acceleration**

UADP 2.5sec
With **Encryption Engine**

16GB Memory

New Flexible Uplink Options

StcakWise-1T
1 Terabit Stacking
Bandwidth

StackPower+

Enhanced App Hosting
2 x App Hosting Capacity

UADP 2.5sec – Next Generation of ASIC Innovation

Investment Protection
Flexible Pipeline

Enhanced Scale/Buffering

500GE
Bandwidth

16MB
Packet Buffer

1/2.5/5/10/25/40/100G
Supports Different Speeds

64K
Netflow Records

QAT Engine
(HW Acceleration)

100G Encryption

1T
Stacking Capacity

Up to 2X
forwarding + TCAM

Enhanced App Hosting
2 x 10G App Gig ports

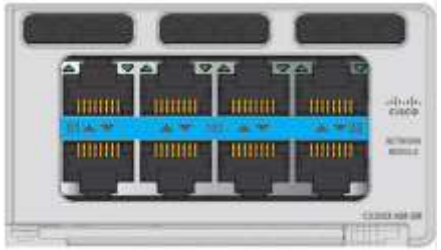
Catalyst 9300X

Highest Speed Uplink Options in the Industry

100/40G Modular Uplinks

2 x 100/40G QSFP

Multigigabit Uplinks



8 x 10G-mGig

10/25 G Modular Uplinks

8 x 10/25G

Catalyst 9300X Models

C9300X-24Y: 24-port 1/10/25G SFP+ Switch

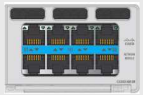
C9300X-12Y: 12-port 1/10/25G SFP+ Switch

- 24 and 12 port SFP SKUs
- Transition Catalyst 3850 1G SFP to Catalyst 9300 1G SFP Models
- Transition Catalyst 3850 10G SFP to Catalyst 9300X 10/25G SFP+ Models
- Wire-speed, non-blocking performance
- Seamlessly integrates with Cisco Catalyst 9300 Series copper
  - Supports same optics
  - Common stacking – StackWise-480
  - Common power stacking – StackPower
  - Common power supplies, fans, cables

Modular fans

Modular uplinks

2 x 100/40G QSFP



8 x 10G-mGig

8 x 10/25G

Higher-efficiency AC and DC power supplies

Platinum rated

350W AC-P 715W AC-P 1100W AC-P 1900W AC-P 715W WDC*

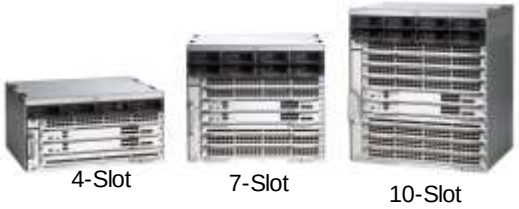
* DC PS is Gold-Rated

Secure Cloud Connectivity

1/10/25G fiber aggregation

Collapsed access

48 mGig Ports x 90W 802.3bt UPOE+® Line card

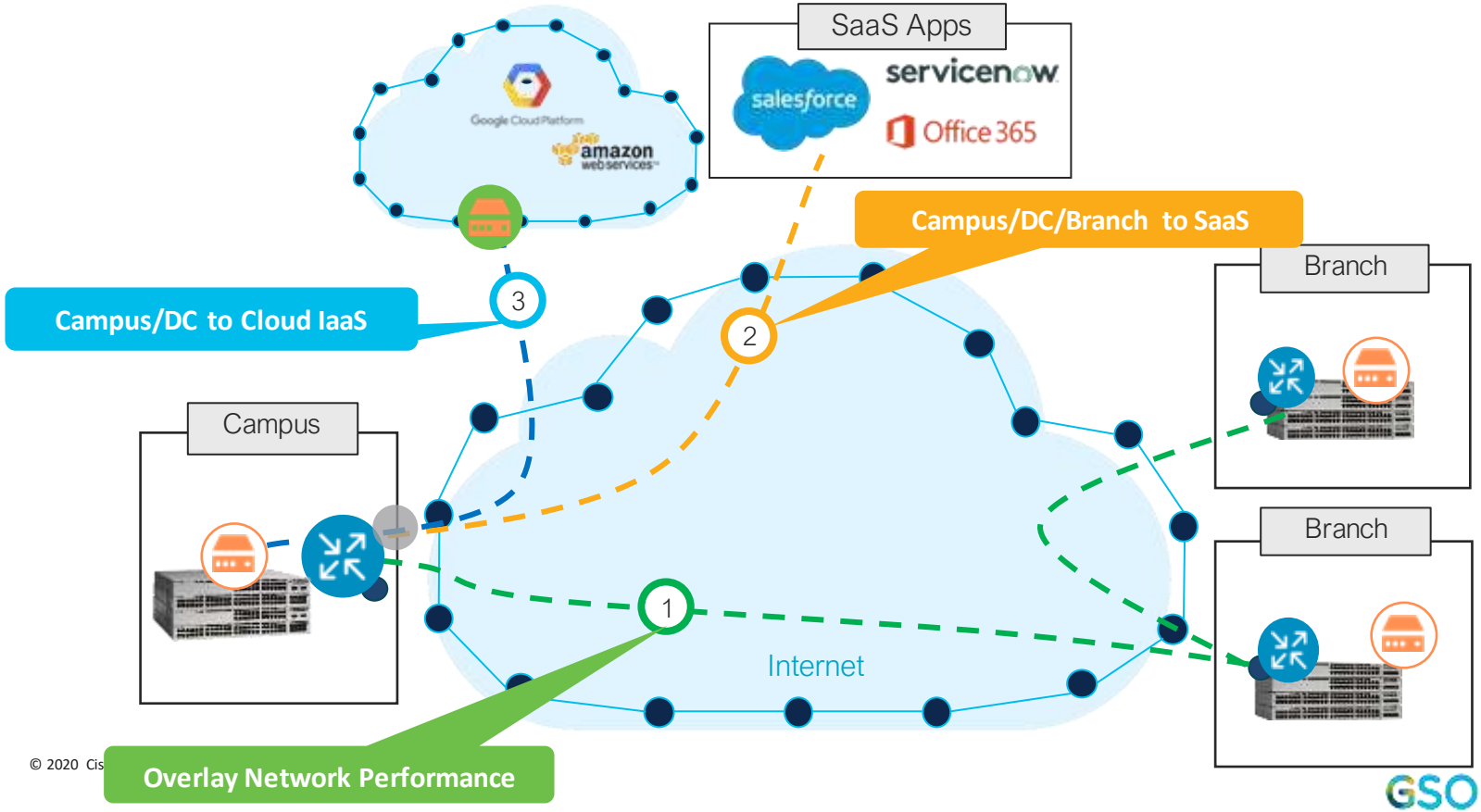


C9400-LC-48HN

- Support for **Type 4 PSE (up to 90W per port or Class 8)**
- By default compliant with IEEE 802.3bt standard
- Compatible with previous IEEE 802.3af and IEEE 802.3at standard
- Up to 5G line rate on all 48 ports
- Supported Speed 100M, 1G, 2.5 G, 5G
- Up to 240 x 90W concurrent ports in chassis
- Up to 48 concurrent ports per linecard

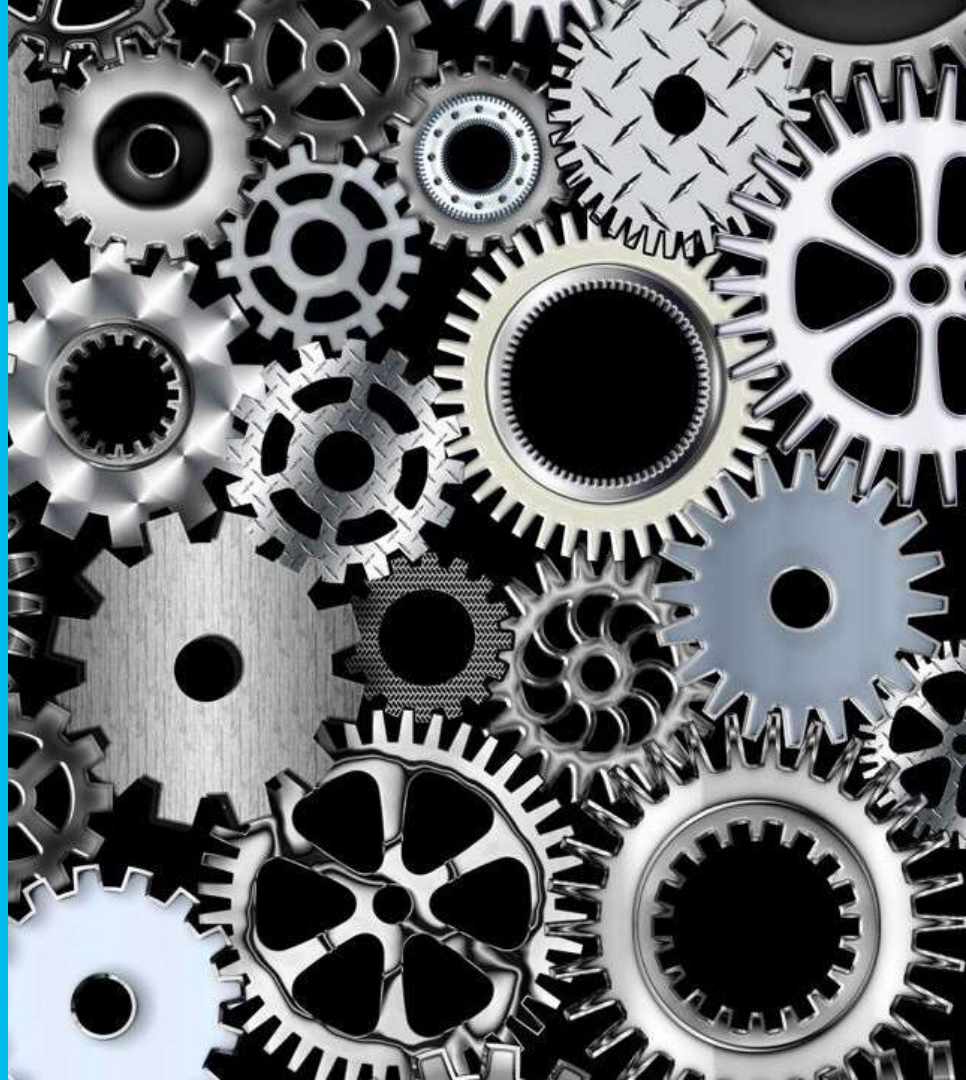
Service Assurance is beyond the Enterprise Domain

Use cases for ThousandEyes Enterprise Agent

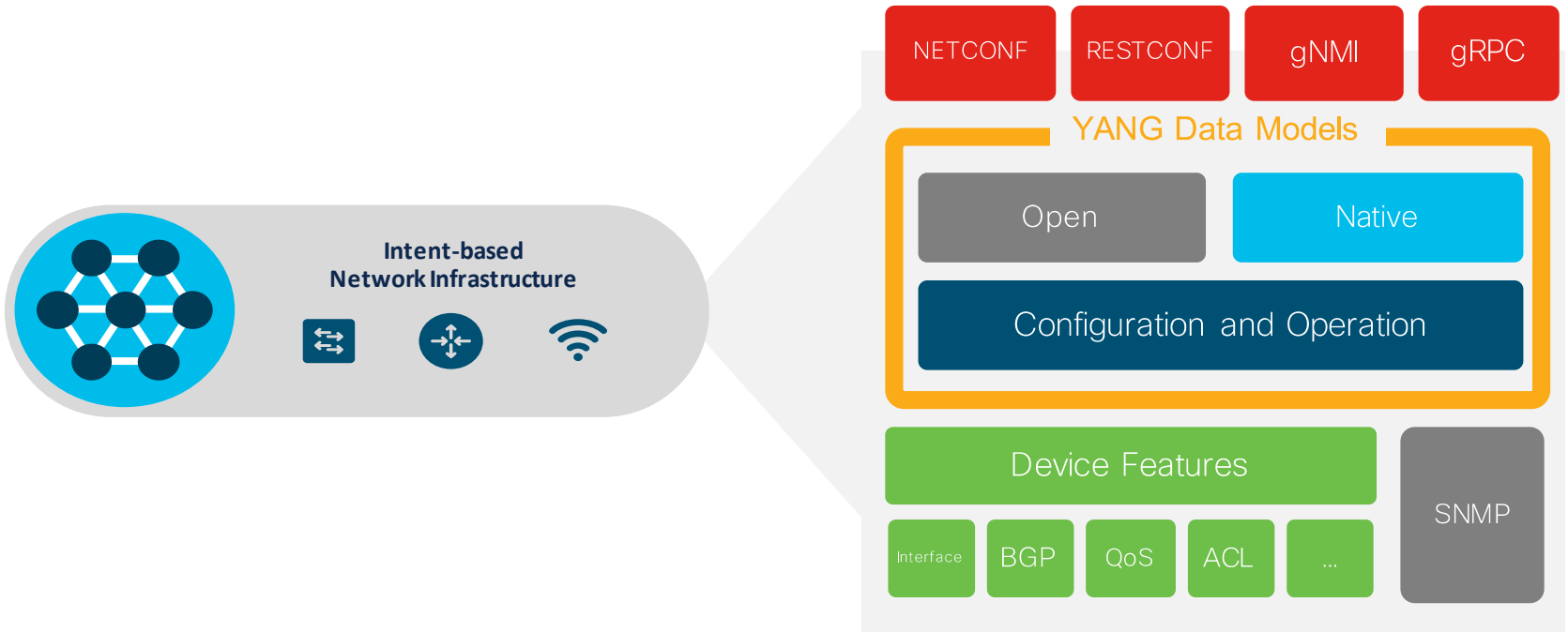


GSO GO-TO-MARKET STRATEGY & OPERATIONS

Dev Tools



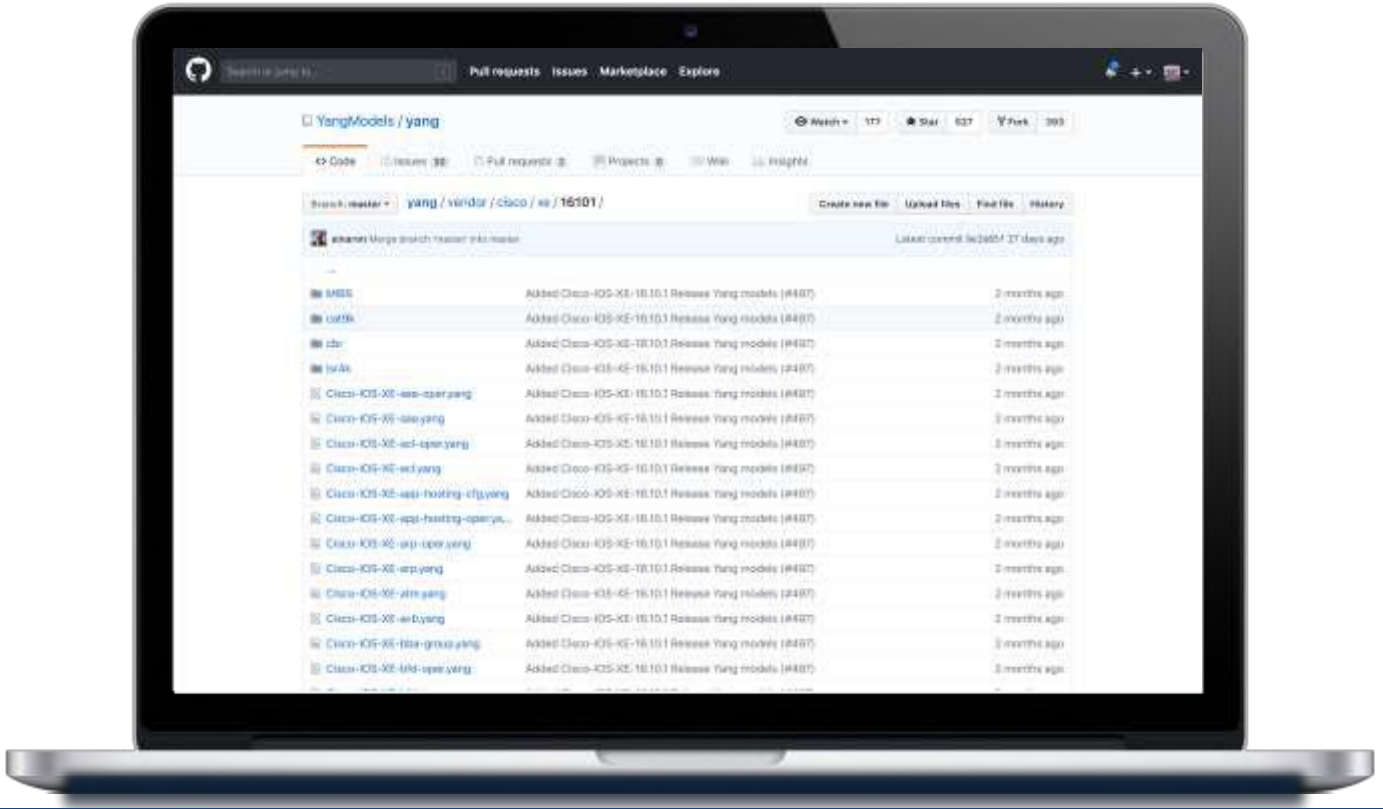
Model Driven …



YANG Tooling

- Github – source code of YANG models
- Pyang – YANG model validator
- ncclient – python module for NETCONF
- Ydk (YANG development kit) – python module for prototypes **(Cisco)**
- Ncc – Essential tool to work with NETCONF **(Cisco)**
- Netconf-console – Wrapper around Ncc **(Cisco)**
- ~~YangExplorer~~ -> **Yang Suite (Cisco)**

IOS XE YANG Model Support

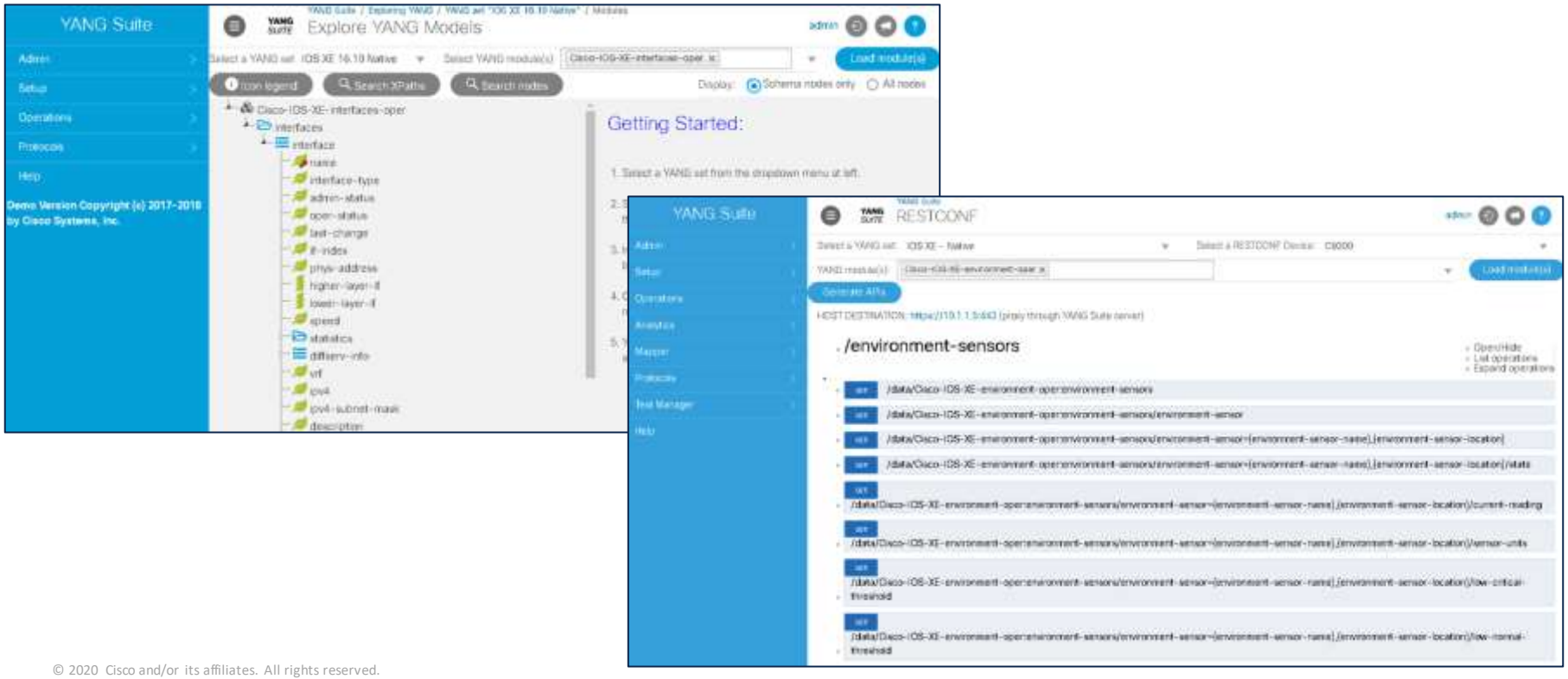


https://github.com/YangModels/yang/tree/master/vendor/cisco/xe

How to find my xPath??

https://github.com/CiscoDevNet/yangsuite

YANG Suite!



Does Meraki use NETCONF/RESTCONF?

- Postman: https://www.postman.com/ciscodevnet
- Meraki API Doc: https://developer.cisco.com/meraki/api-v1/

Streaming Telemetry

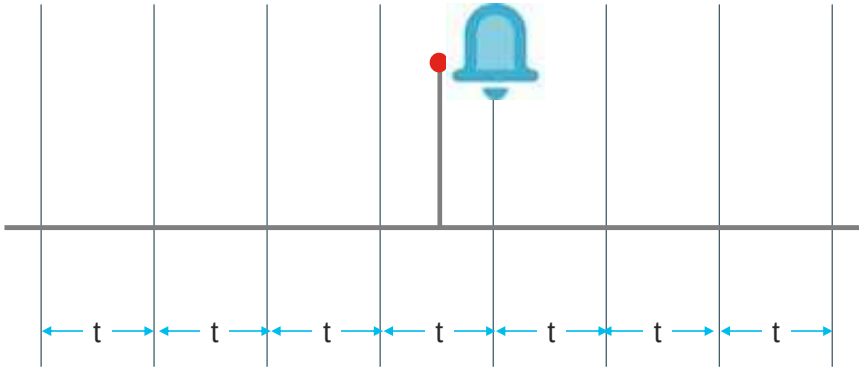
Model Driven Telemetry Interfaces

	NETCONF	gRPC	gNMI
IOS XE	16.6+	16.10+	16.12+
Method	Dial-In, pull	Dial-Out, push	Dial-In, pull
Configuration	Per session	Configuration based	Per session
Telemetry Receiver	Client	Server	Client
Encoding	XML	JSON + Protobuf	JSON_IETF
Security	SSH + Keys	Plain Text	TLS Certificate
Data Models	YANG	YANG	YANG

Model Driven Telemetry

Publication Types

On-Change

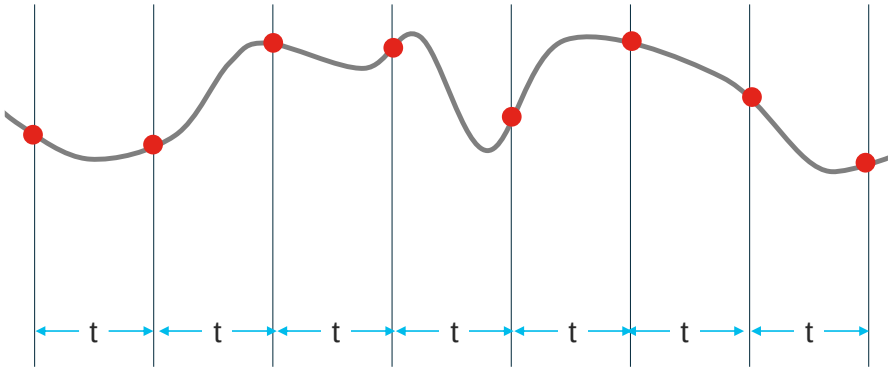


NETCONF Base Notifications

Event Notifications (failed login, etc)

Feature Model "On-Change" Notifications

Periodic



Feature Model "Periodic" Notifications

Q. How granular are periodic notifications sent?
A. Minimum 1 second, defined in centiseconds

Can SNMP do that?

Periodic subscriptions to the CPU utilization YANG data model updates will be pushed every 1 second!

gRPC Dial Out Configured Telemetry

CLI

…or with… + Ansible

YANG

Cisco IOS XE 16.10+

gRPC Dial-Out

Receiver
Decodes to text

telegraf

Collector
Time Series Database

InfluxDB

Monitoring
and Visualizations

Grafana

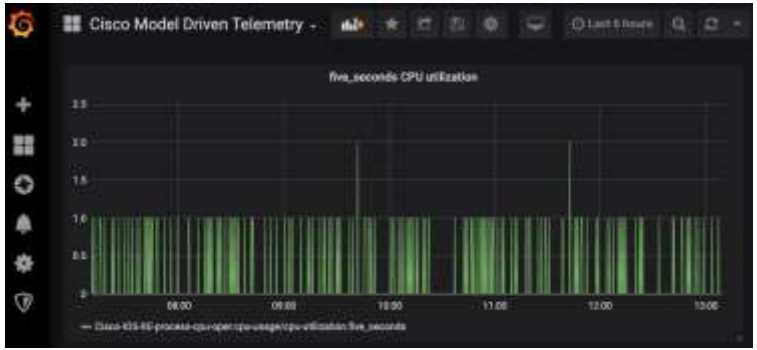
Telemetry Quick Start

1. Download and start the Docker container from https://hub.docker.com/r/jeremycohoe/tig_mdt

```
$ docker pull jeremycohoe/tig_mdt
$ docker run -dit -p 3000:3000 -p 57500:57500 jeremycohoe/tig_mdt /start.sh
```

2. Configure the IOS XE device to send telemetry
https://github.com/jeremycohoe/cisco-ios-xe-mdt

```
telemetry ietf subscription 102
 encoding encode-kvgpb
 filter xpath /interfaces-ios-xe-oper:interfaces/interface
 source-address 10.85.134.65
 stream yang-push
 update-policy periodic 2000
 receiver ip address 10.85.134.66 57500 protocol grpc-tcp
```



3. Access the Grafana interface on port 3000

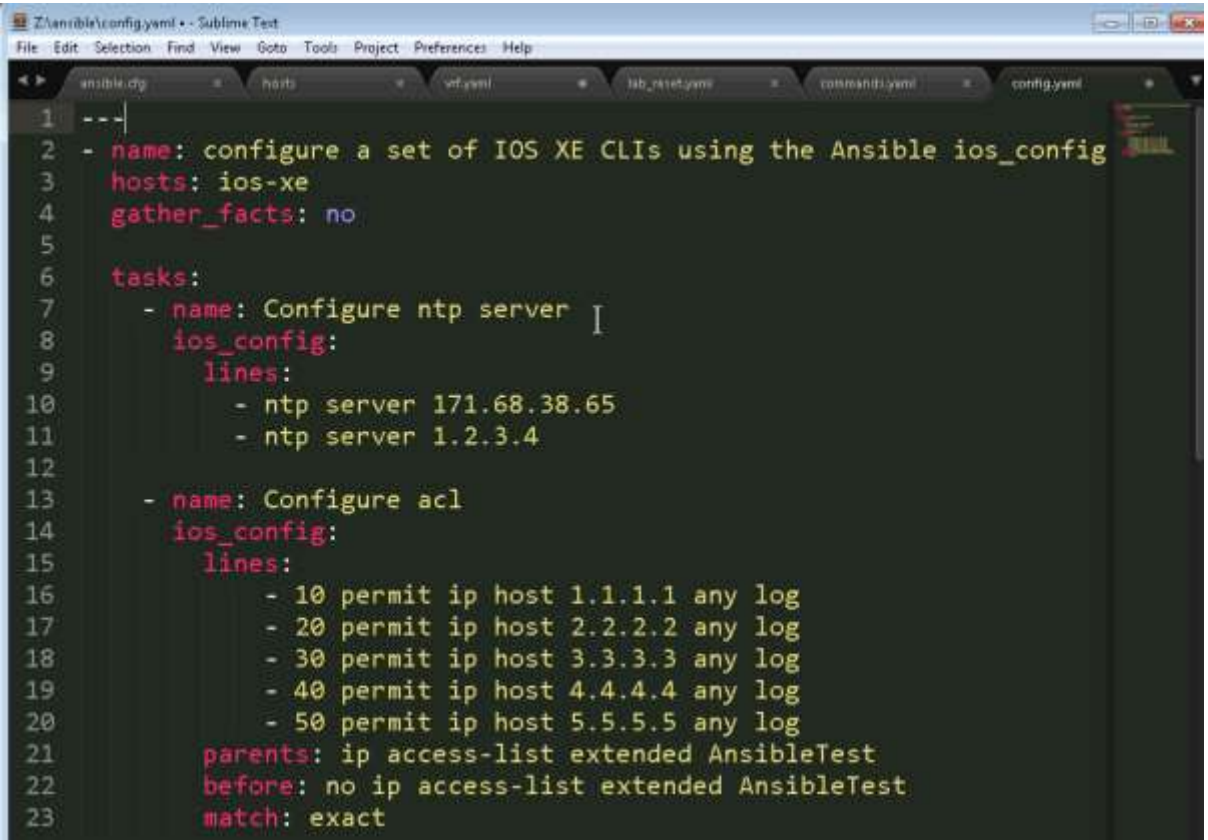
One click Grafana dashboard

https://grafana.com/orgs/ciscojer

Ansible:

- Simple to install and get started
- Written in Python
- Servers, Application and Networking
- Roles, Variables, Templates
- Agentless!
- Agentless!!
- Agentless!!!

Ansible Demo



Ansible Resources

- **DevNet**:
  - DevOps video course
    https://developer.cisco.com/video/net-prog-basics/05-netdevops
  - Configuration Management
    https://developer.cisco.com/docs/ios-xe/#configuration-management-quick-start-guide
  - https://developer.cisco.com/automation-ansible/

- **Ansible examples on GitHub:**

  https://github.com/jeremycohoe/ansible-config-samples

- **Ansible Documentation for Network Automation:**

  https://docs.ansible.com/ansible/latest/network/index.html

  https://www.ansible.com/integrations/networks/cisco

GitHub

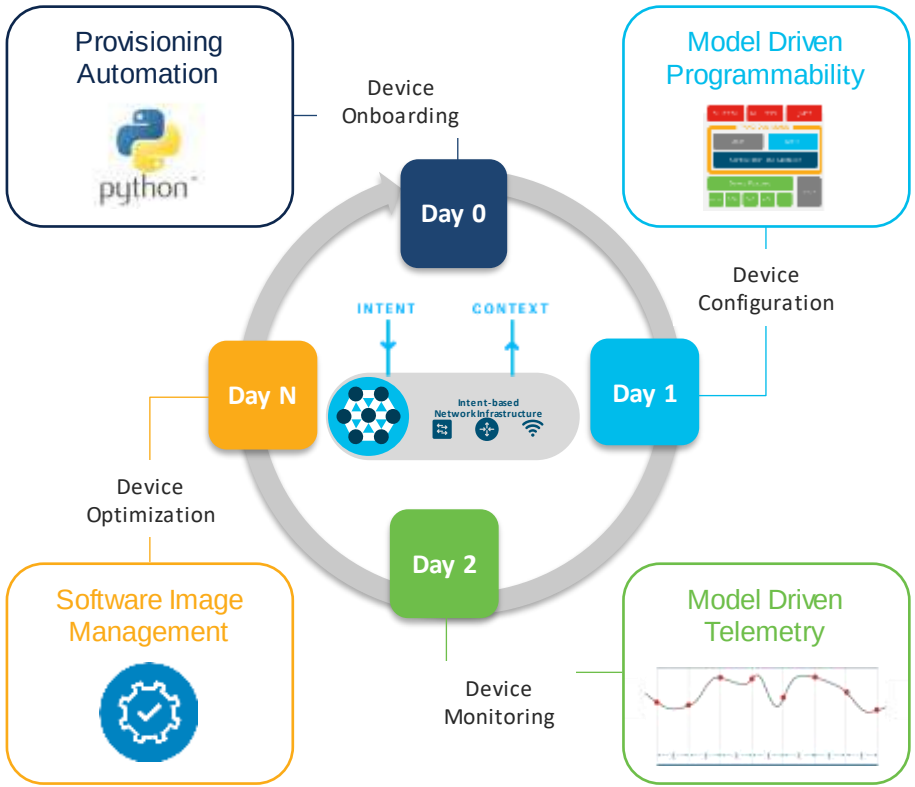
ANSIBLE

IOS XE Programmability

Pre-boot Execution Environment

Zero Touch Provisioning

Plug and Play



Network Configuration Protocol (NETCONF)

RESTCONF

YANG Data Models

gNMI + OpenConfig

Guest Shell

On-Box Python

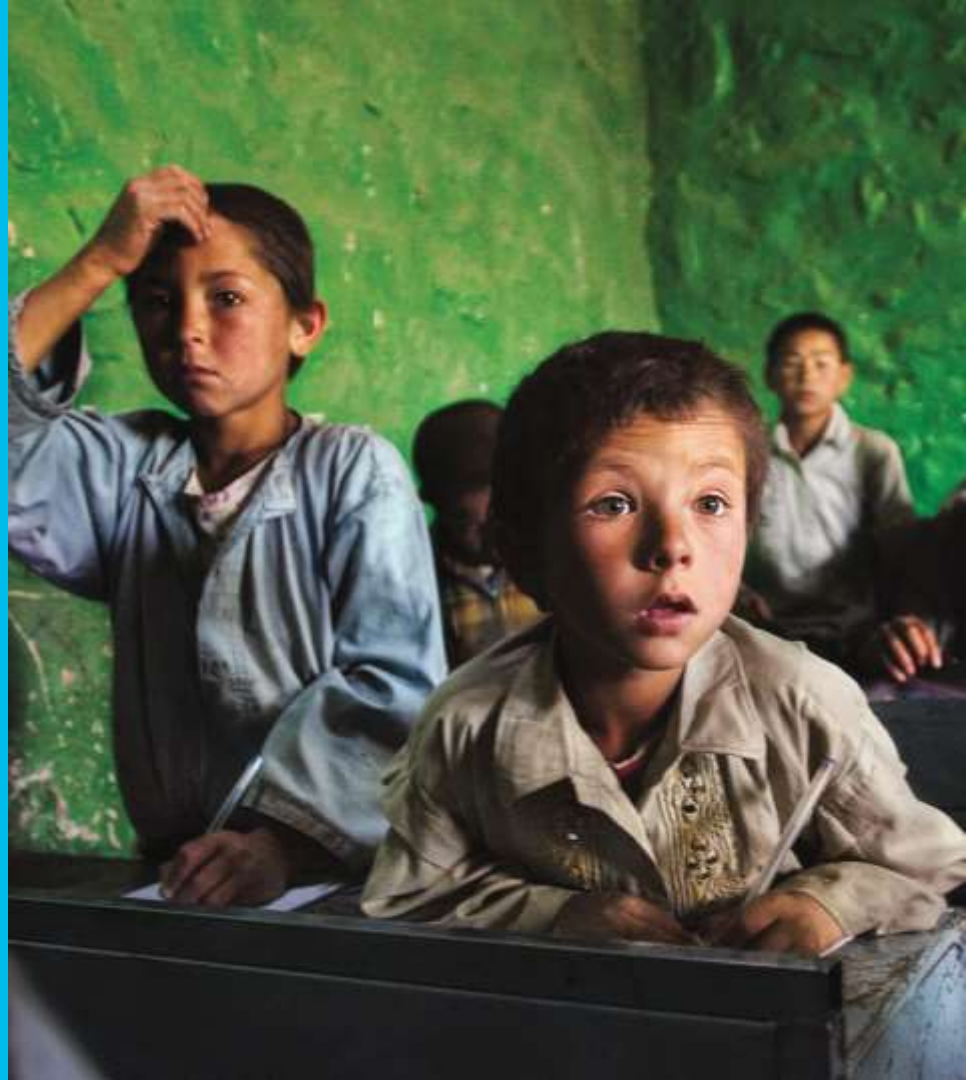
Application Hosting

gNMI Dial-In

gRPC Dial-Out

NETCONF Dial-Out

Use Cases



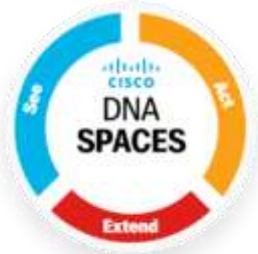
Slido!!

Real Use Cases

1. Automation of day-to-day tasks (custom GUI)
2. Implementation of new custom features
3. Integration with existing tools
4. Providing data streams

DNA Center

ACI Multi-Site



IOS-XE DOM Telemetry

Predictive Fiber Maintenance

1 **The network is monitored.**

During normal operations, the network running along the public infrastructure and their fiber connections are continuously monitored. The network operator can view the data that is periodically updated in a dashboard at any time.

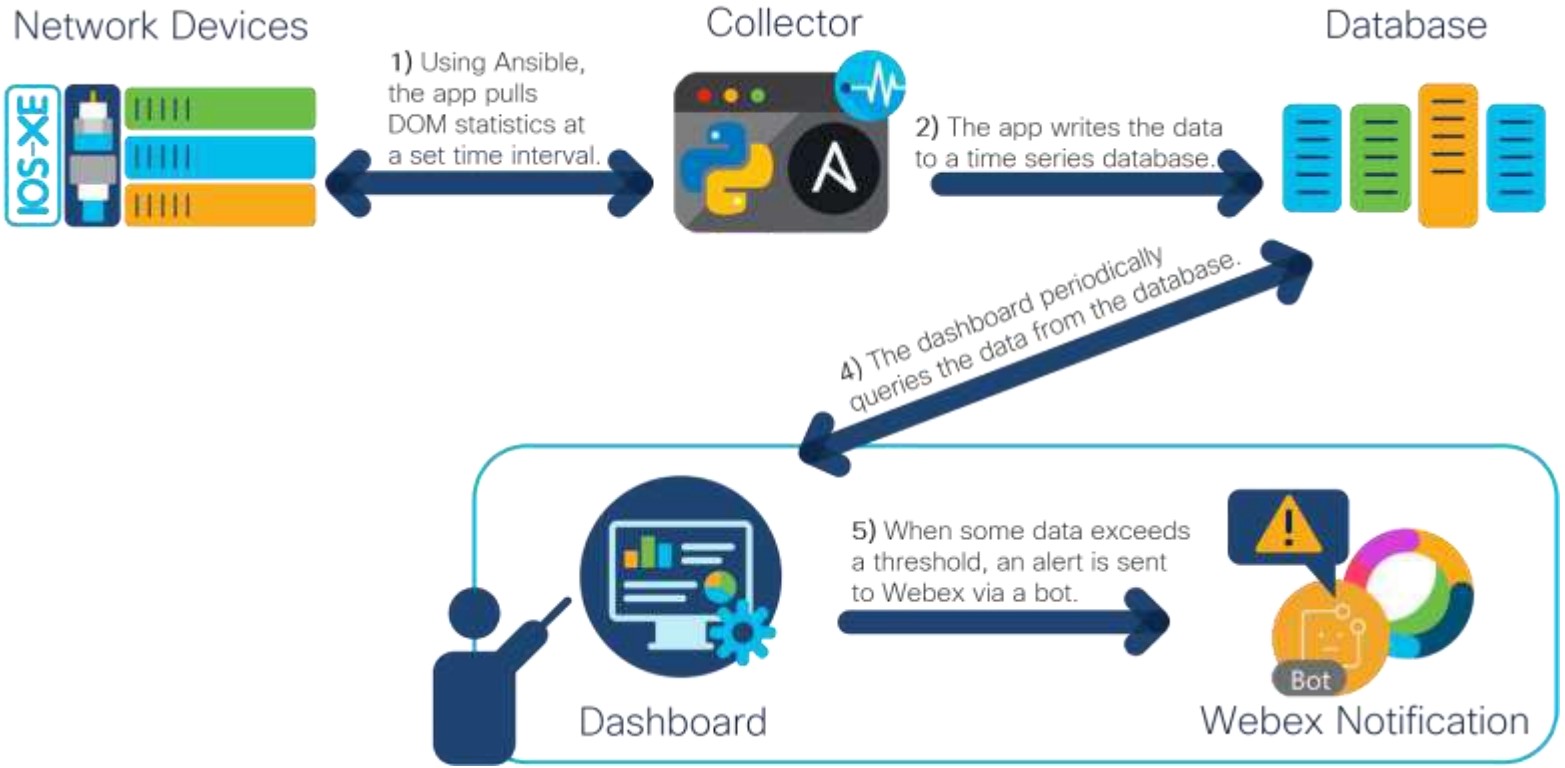
2 **An alert threshold is exceeded.**

The network operator receives an alert that one of the DOM values at a certain transceiver module is below (or above) its configured threshold.

3 **Maintenance work is performed.**

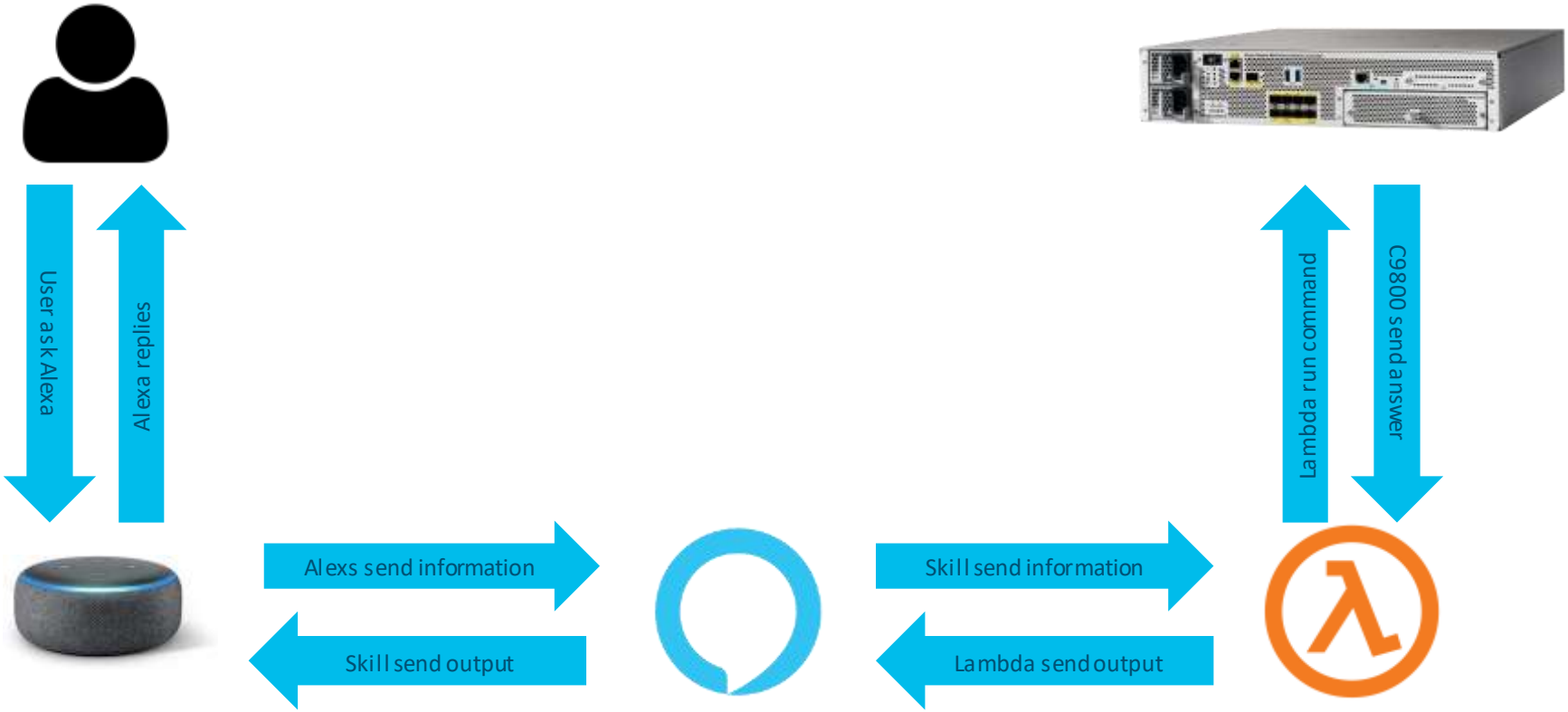
The network operator schedules a maintenance window at a convenient time (e.g. when there is little traffic) and prepares and plans the maintenance work based on the data. At the dedicated time window and equipped with the right tooling, he/she can perform the maintenance efficiently and quickly before the link goes down.

High Level Design



Alexa Skill with CLI & NetConf

High Level Design PoV



Video link


CISCO

Resources

- Devnet Code Exchange
- Catalyst 9800 Learning Lab Streaming Telemetry
- Catalyst 9800 Programmability Deployment Guide
- Catalyst 9800 Programmability Configuration Guide
- Github MDT Lab


CISCO