

Intro to Edge Computing/IOx App Hosting

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#DevNetDay



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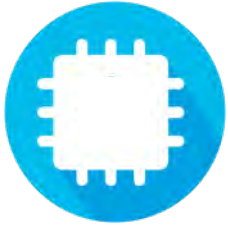
Agenda

- What is Edge Compute?
- Where is it used in reality?
- What is Cisco IOx?
- Application hosting
- Use cases
- Call to Action!

What is Edge Compute?

Edge Compute

What it is?



Sensors &
Devices



Edge



Fog



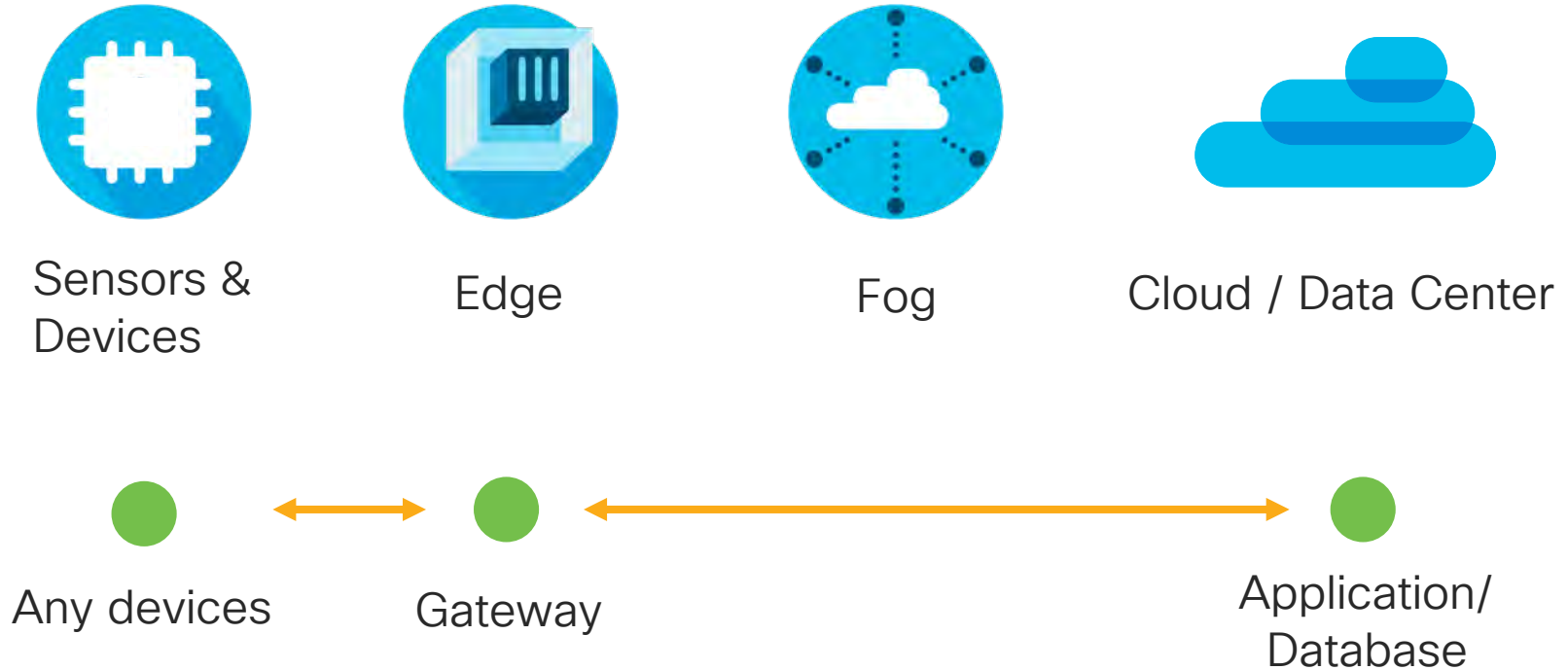
Cloud / Data Center



- Sensing
- Intelligent ?

Computing

Scenario: Gateway



Edge Compute

Why it Matters?



Safety

react fast in emergency Situations



Data Protection

confidential Data remains On-site



Bandwidth

low-bandwidth Usage



Latency

low latency and faster Response Time



Always-on Connectivity

independent of Cloud Connectivity



Connecting Heterogeneous Systems

collecting data from heterogeneous Systems to an open normalized Network

CISCO *Live!*

Roadway

The diagram illustrates a Smart Roadway system. A road with a yellow dashed center line and white dashed edge lines is shown. On the left, a 'Weather Station' is connected to a 'Weather Sensors' icon. A 'Traffic Light' is also shown. A green car is driving on the road, connected to a 'DSRC' (Dedicated Short-Range Communications) icon. A large green cloud contains a server rack and a monitor displaying a bar chart. A green dashed line with white dots connects the cloud to the road. Blue dashed arrows indicate data flow between the weather station, traffic light, car, and cloud. A blue dashed arrow also points from the cloud to the road.

- Process vehicles and roadway sensor data for real-time response at the edge without backhaul dependency

Manufacturing

The diagram illustrates a Manufacturing IIoT architecture. At the bottom left, a yellow robotic arm and a conveyor belt system represent the physical manufacturing process. These are connected to a central 'Factory' block, which contains a server icon and a Wi-Fi symbol. To the right of the factory is a circular inset showing a worker in a hard hat and a computer monitor displaying a bar chart. Above the factory is a green cloud icon labeled 'Enterprise Data Center'. A thick green vertical line connects the cloud to the factory. Below the factory, a yellow rounded rectangle labeled 'Machines | Sensors' is connected to the factory by three vertical blue double-headed arrows, indicating bidirectional communication. The entire diagram is set against a light blue background with a white grid.

- Consume machine/sensor data at edge by factory manager analysis and operator dashboard

Oil & Gas

Oil & Gas

Realtime Alert

Gas Detection Sensors

Edge Compute

Mobile Detector

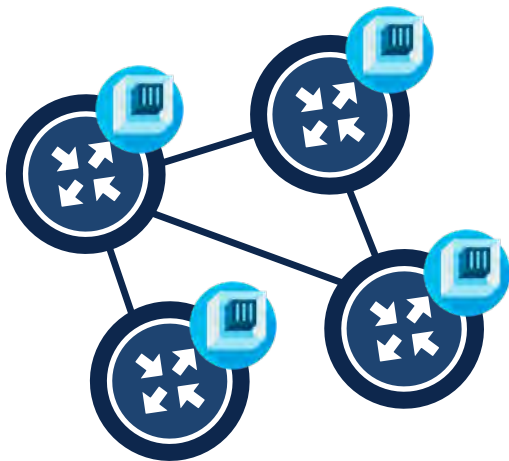
- Process sensor data at edge for real-time alert for safety and process compliance



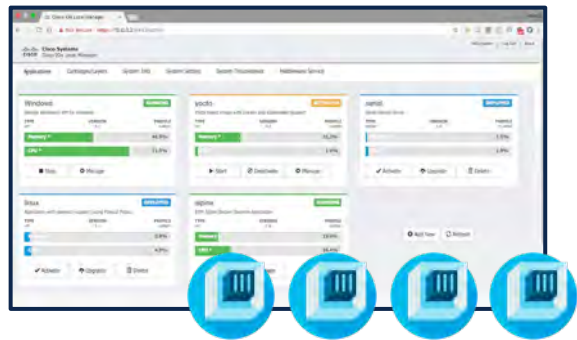
What's IOx?

Cisco IOx = IOs + linuX

Cisco IOx is an **Application Management Framework** that allows you to execute IoT Applications **on the Edge**.

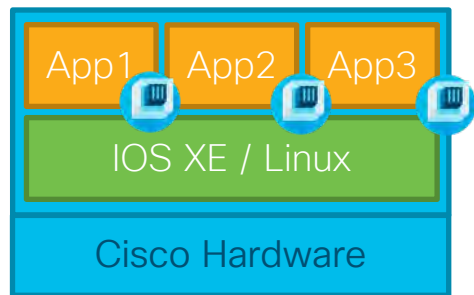


**IOx enabled Cisco Networking
Devices**



**Application Management
Interface & API**

IOx Management Options



Local: Local Manager



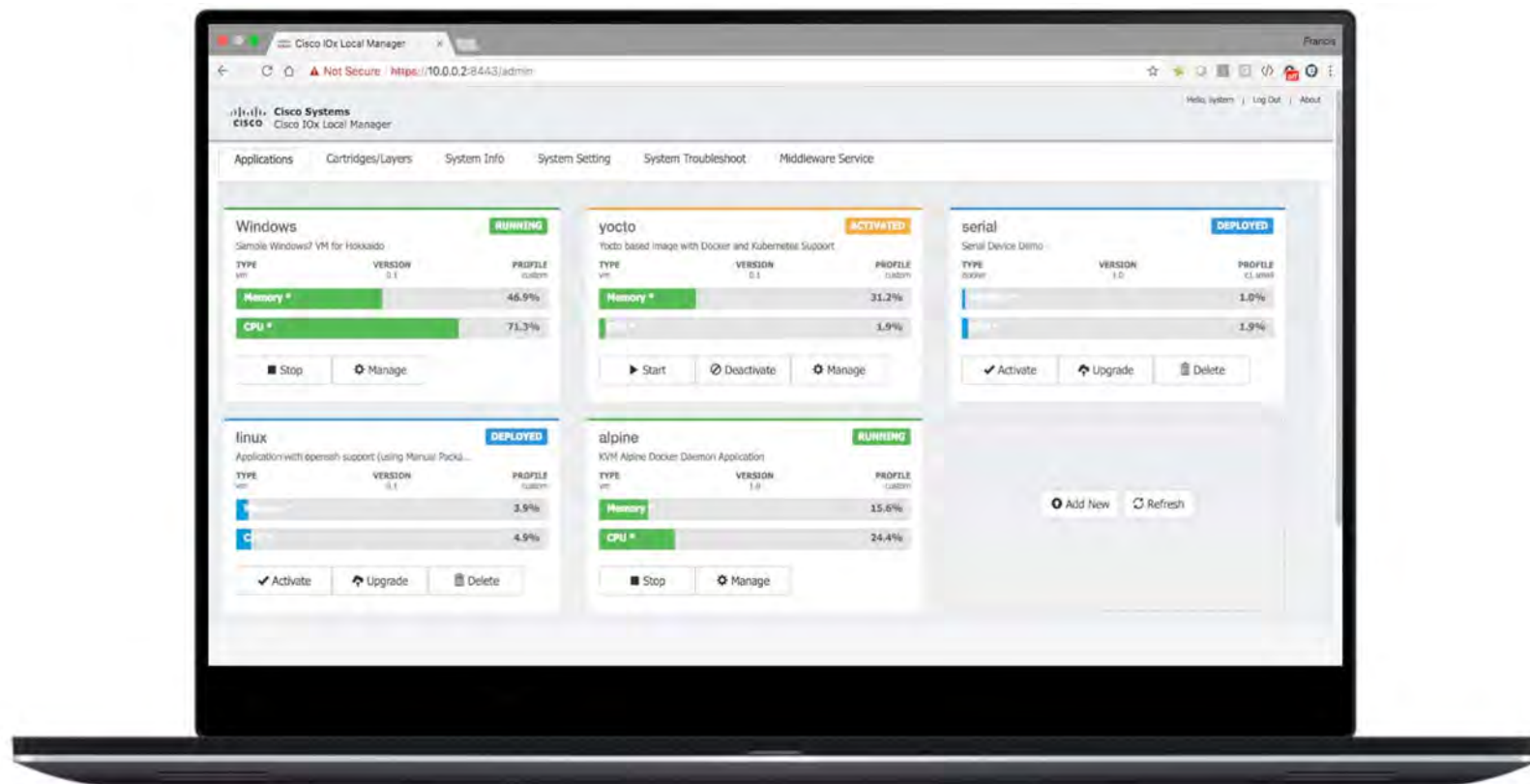
Cloud: Kinetic Gateway Management Module



On-Premise: Field Network Director

On-Premise: DNA Center

IOx Local Manager – Graphical User Interface!



ioxclient – Command Line Tool!

Easy to use CLI to perform most common operations

```
root@37f85e1027c8:~# ioxclient --help
NAME:
  ioxclient - Command line tool to assist in app development for Cisco IOx platforms

USAGE:
  ioxclient [global options] command [command options] [arguments...]

VERSION:
  1.9.2.0

AUTHOR:
  Cisco Systems - <iox-support@cisco.com>

COMMANDS:
  debug, dbg          Set debug to on or off
  errorcodes, err     Get ioxclient error code to description map in JSON format
  showguide, guide    View ioxclient reference guide
  application, app    Manage lifecycle of applications
  service, svc        Manage lifecycle of services
  package, pkg        Package an iox application/service/cartridge. Produces an IOx compatible archive
  platform, plt       Manage IOx platform
  cartridge, cr       Create/Delete/List cartridges
  fogportal, fogp     FogPortal operations
  profiles, pr        Profile related commands
  vm, vm              Command for using Virtual Machine tools for IOx app development
  docker, dkr         Commands for using docker tools for IOx app development
  layer, lr           Manage lifecycle of application layers
  show, sh            Show Smart License information
  license, lic        Execute licensing commands
  call-home, call     Set destination address for Smart License callhome
  help, h             Shows a list of commands or help for one command

GLOBAL OPTIONS:
  --profile                Override the profile to be used for the current command
  --non-interactive-mode  execute the command in non-interactive mode
  --help, -h              show help
  --generate-bash-completion
  --version, -v           print the version
```

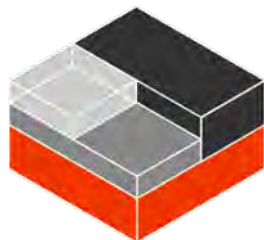

Application hosting

Application Hosting Options



Docker

- Native Docker Runtime
- Directly portable



LXC

- LXC Runtime
- Docker Build process supported



KVM

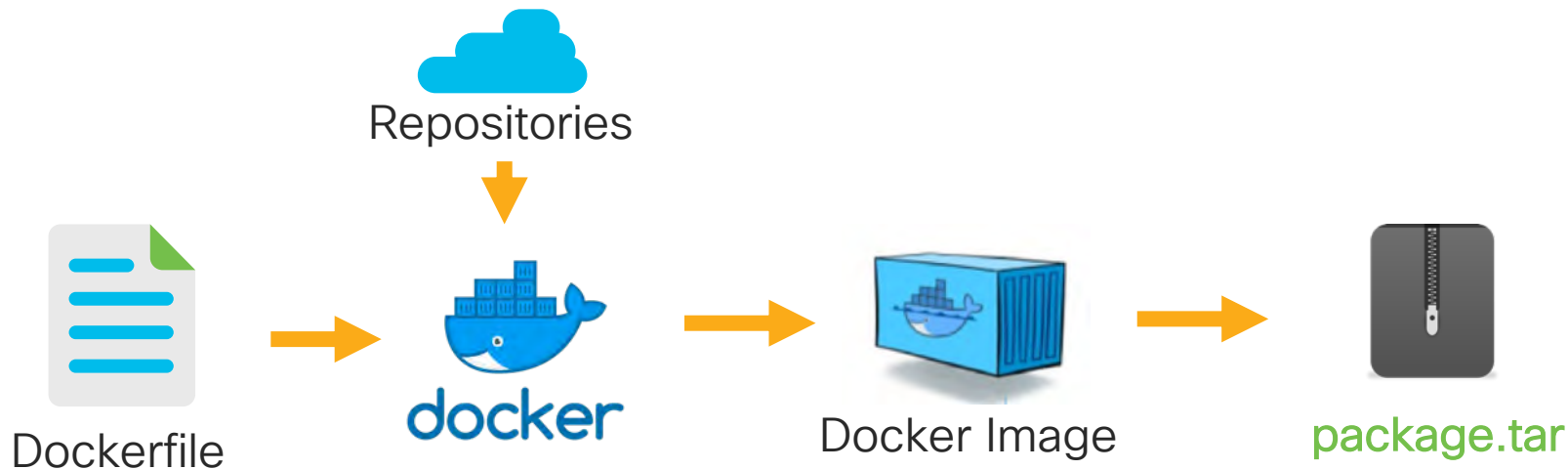
- Virtual Machines



Hypervisors

- Performance is important
- Not supported on IOx network devices (only with UCS-E)

Docker Style



Iox Use Cases

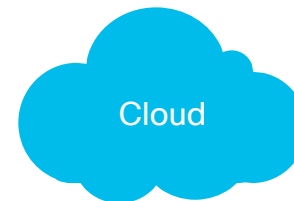
Cisco IOx Applications

Cyber Vision Center

Centralized Analytics & Data Visualization



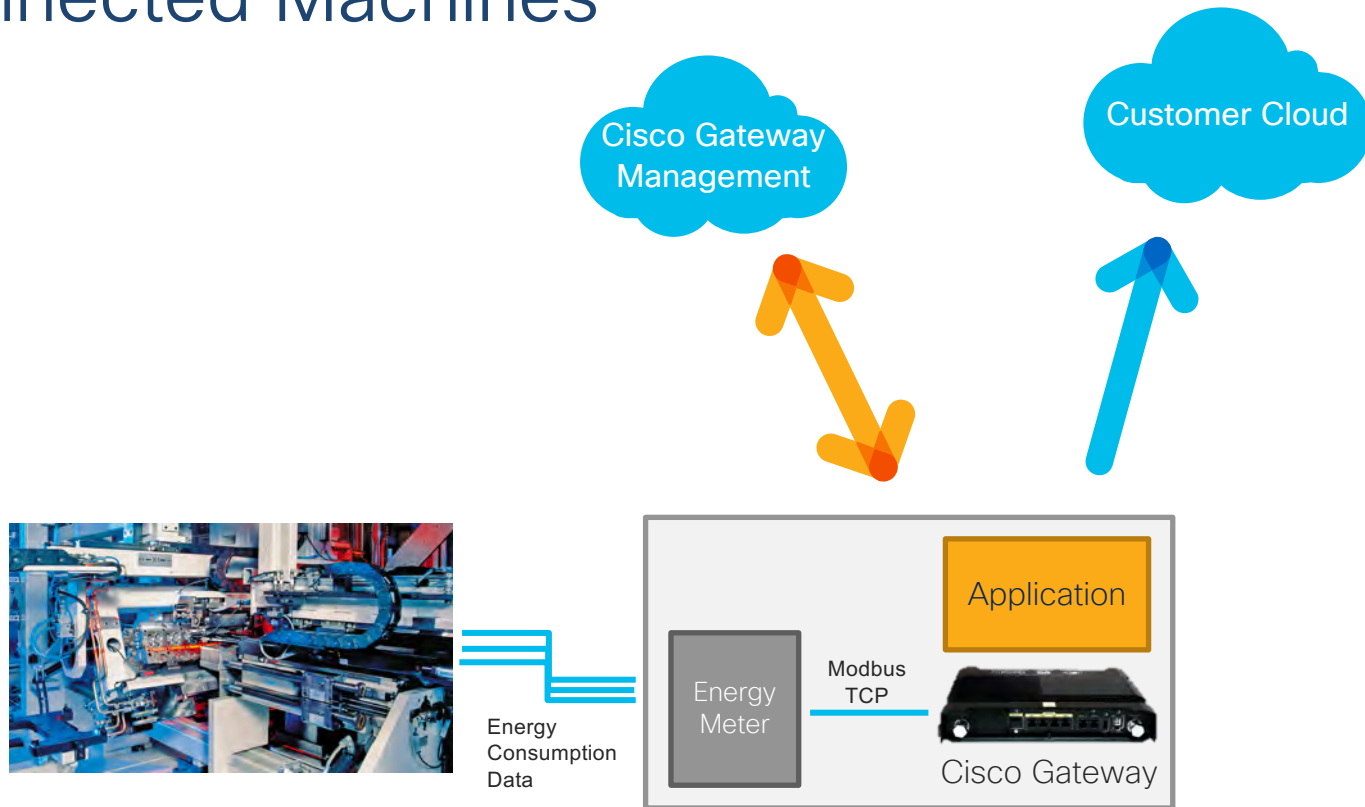
Cyber Vision IOx
Application



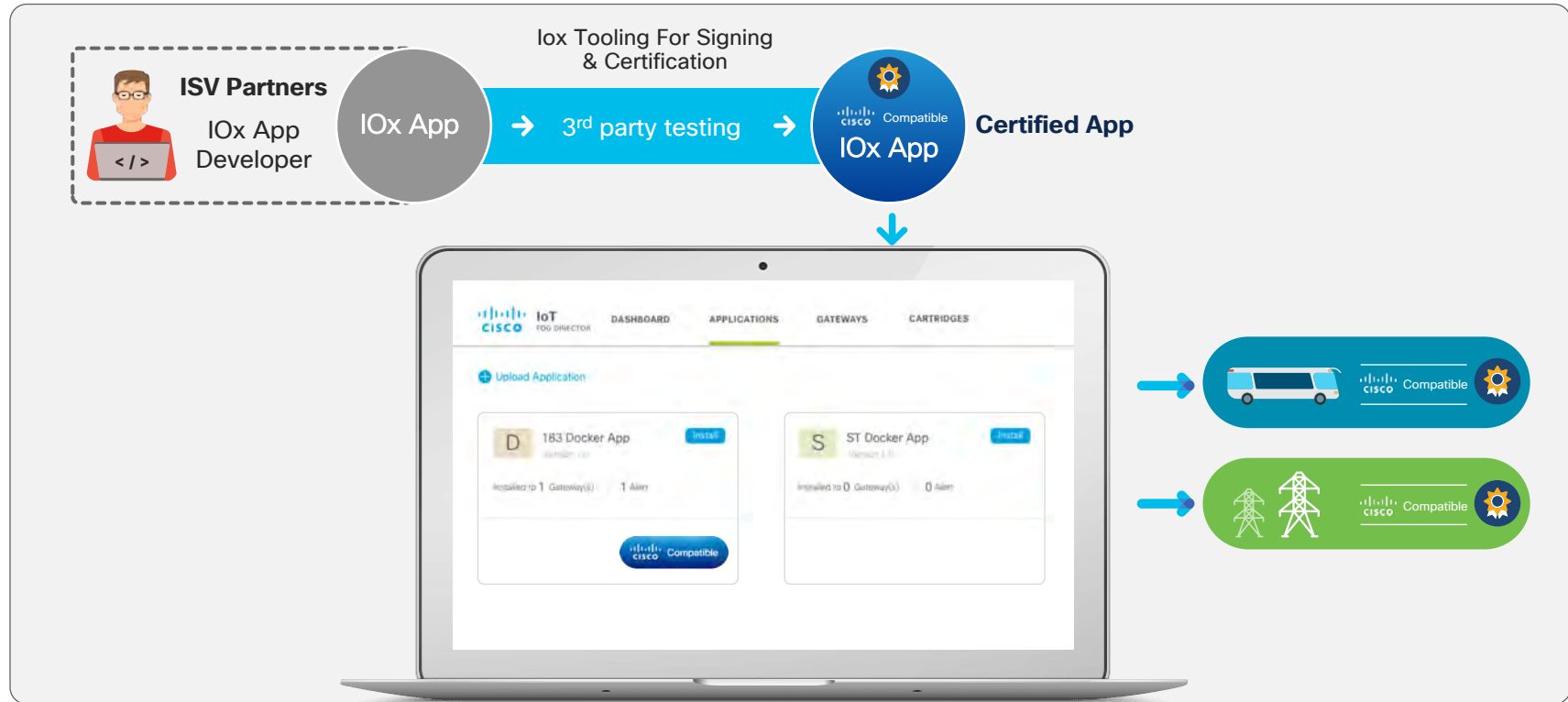
Cisco
Edge Intelligence



Connected Machines



IOx Interoperability Verification Testing (IVT)



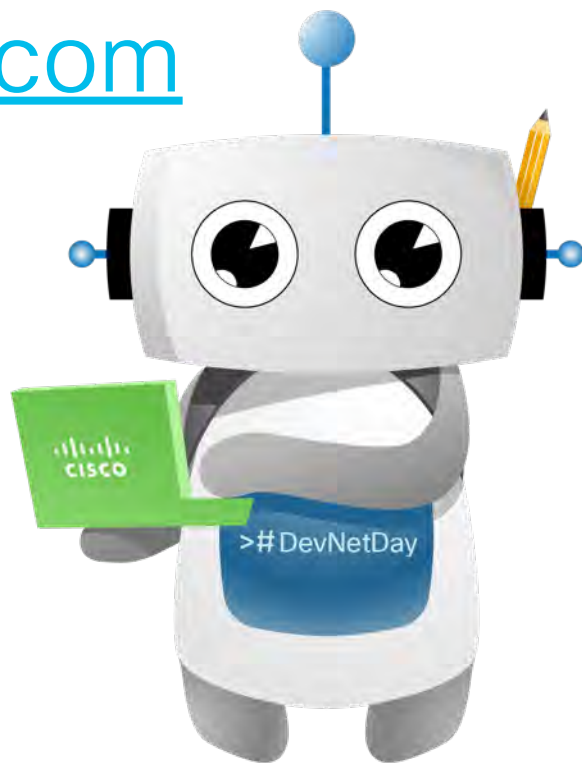


Call To Action!

Continue your learning journey...

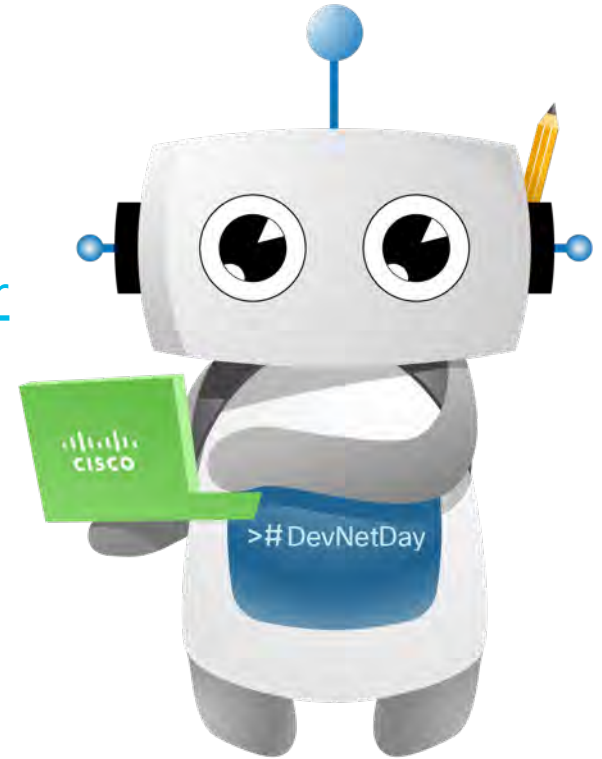
<http://developer.cisco.com>

- Learning Paths (Start Now)
<https://developer.cisco.com/startnow/>
- Reserve FREE Sandbox Environments
<https://developer.cisco.com/site/sandbox/>



Explore More

- <https://developer.cisco.com/site/iox/> - Iox
- <https://www.cisco.com/c/en/us/solutions/internet-of-things/edge-intelligence.html>
- Cisco Edge Intelligence



Thank you



Possibilities

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