
#CiscoLive

The bridge to possible

# How to leverage Cisco IOx to host your application?

## Microservices at the Networks Edge

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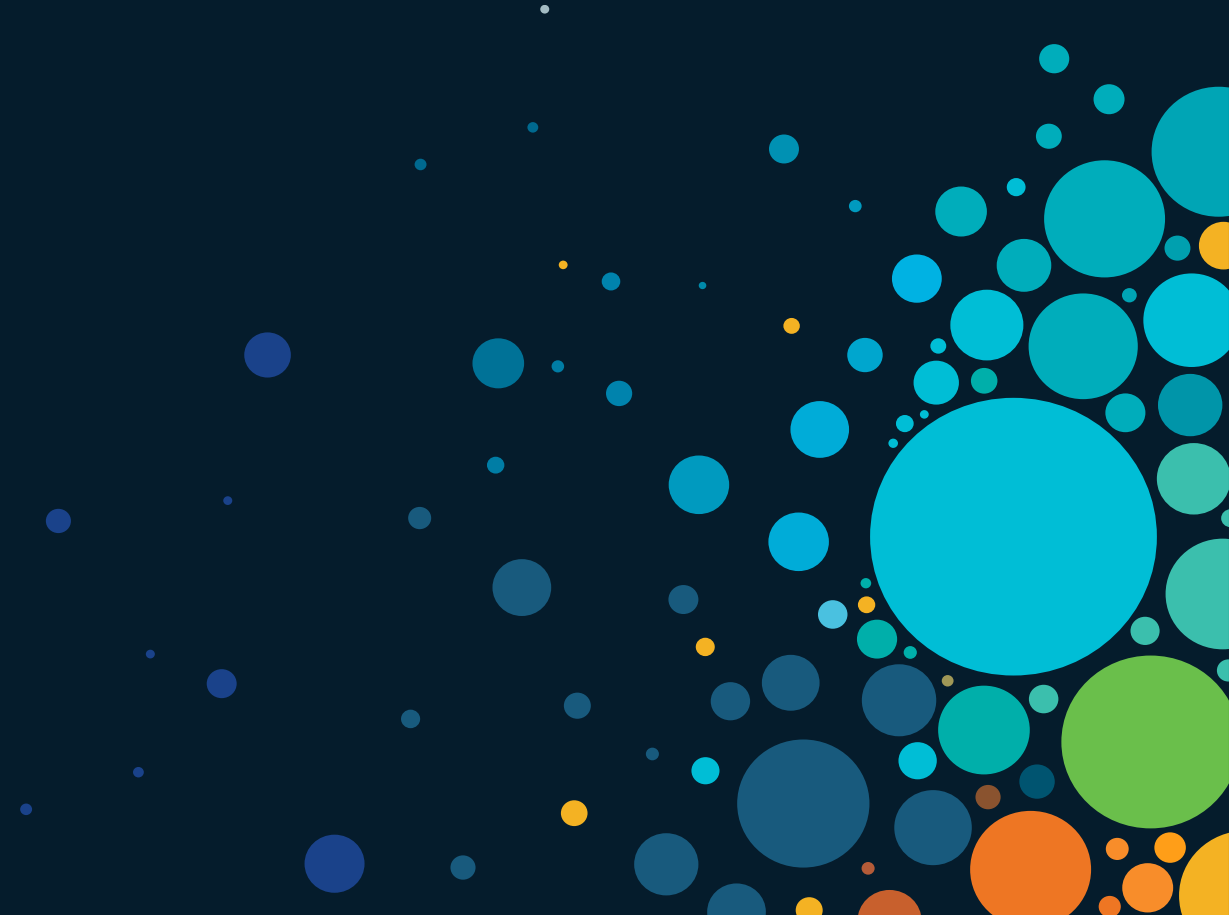
DEVWKS-2934

# Agenda

- Introduction
- What is IOx?
- What is a DevNet Sandbox?
- Let’s prepare and install an application!
- Conclusion and Next Steps

# Introduction



# About our workshop

## We will:

- Familiarize with Cisco IOx
- Get to know Cisco DevNet Sandboxes
- Prepare, install and operate your application to IOx

## We will not:

- Use an automated control-plane or build-pipeline
- Optimize the application or the application image

# Please...

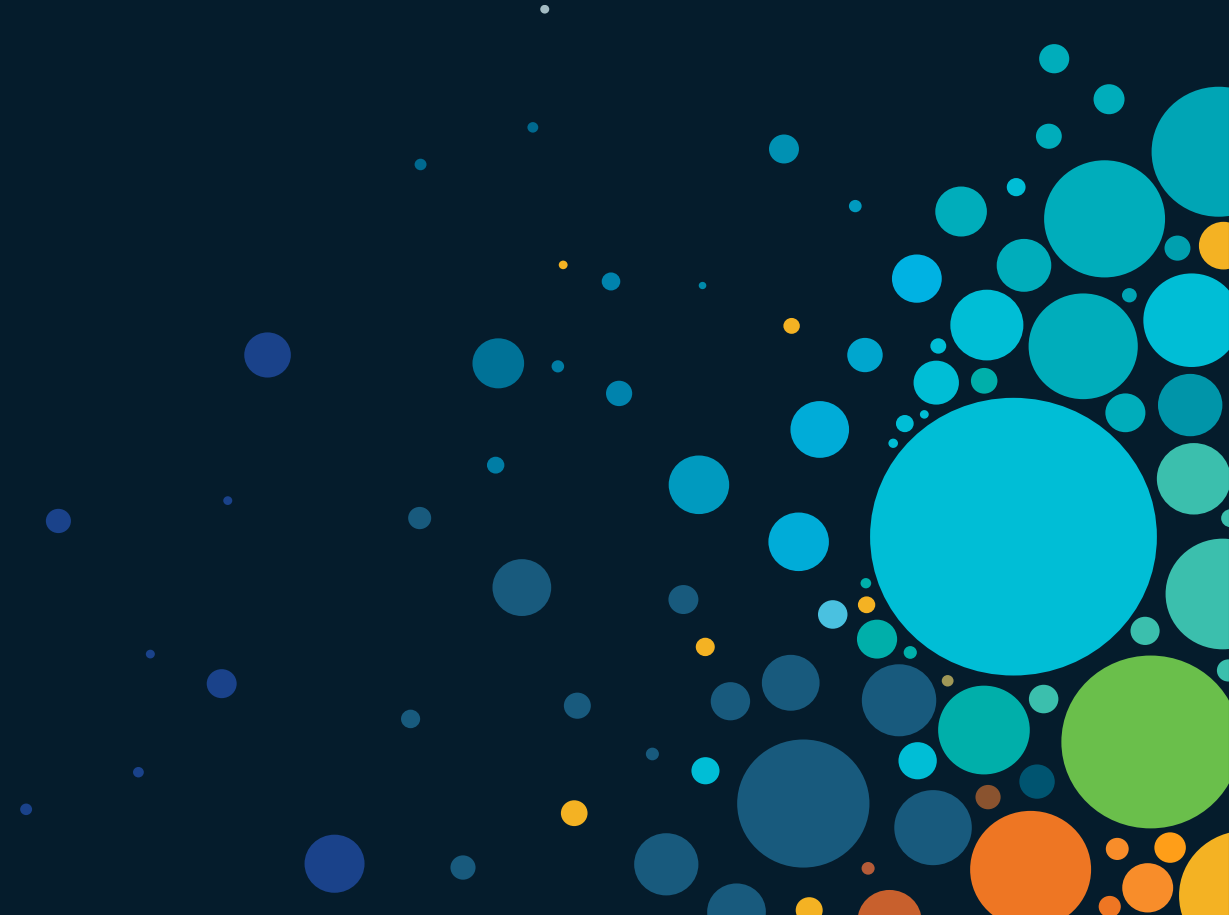
- If you have questions, don’t hesitate to ask!

- If you don’t want to ask during the workshop, I will be around!

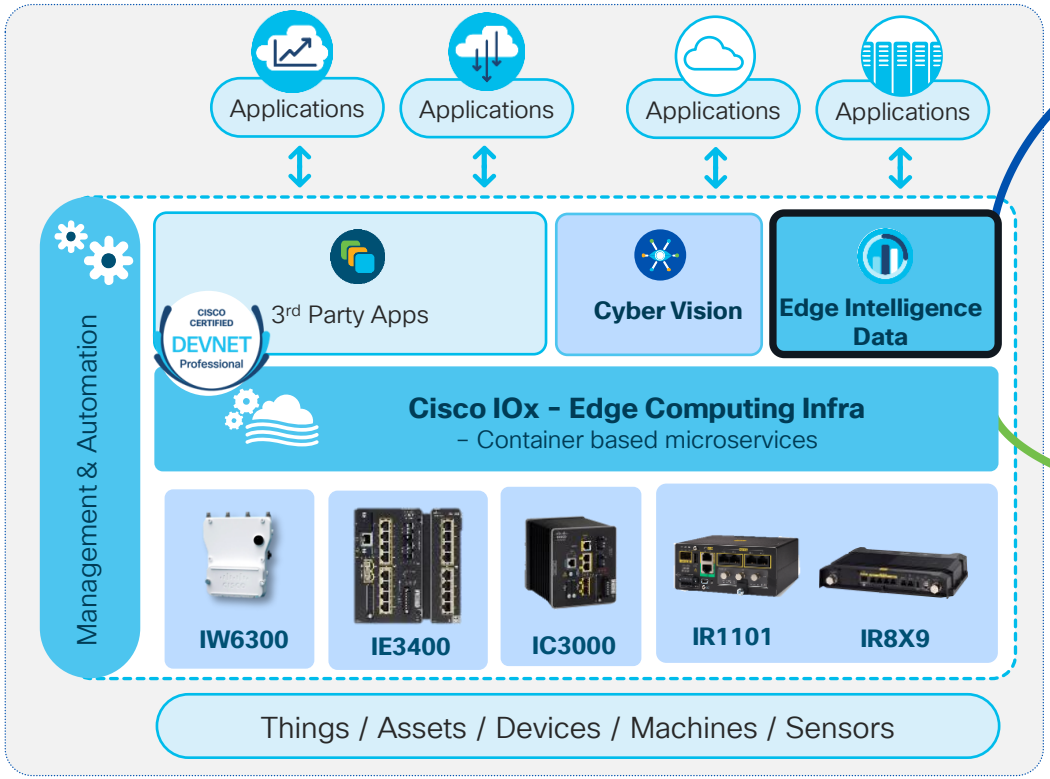
- If you want to exchange later: daeckste@cisco.com

- Do not follow the guide blindly!

# What is IOx?



# Cisco IOx




{Buy}

**Get Started Fast**

Using Cisco Edge Intelligence for edge data processing is the fastest and easiest way to process and send data from the edge

{Or Build}

**Your Own App**

Using Cisco IOx compute infrastructure and development environment you can build your own Docker app that runs at the edge. You manage the lifecycle of your application and monitor its operation.

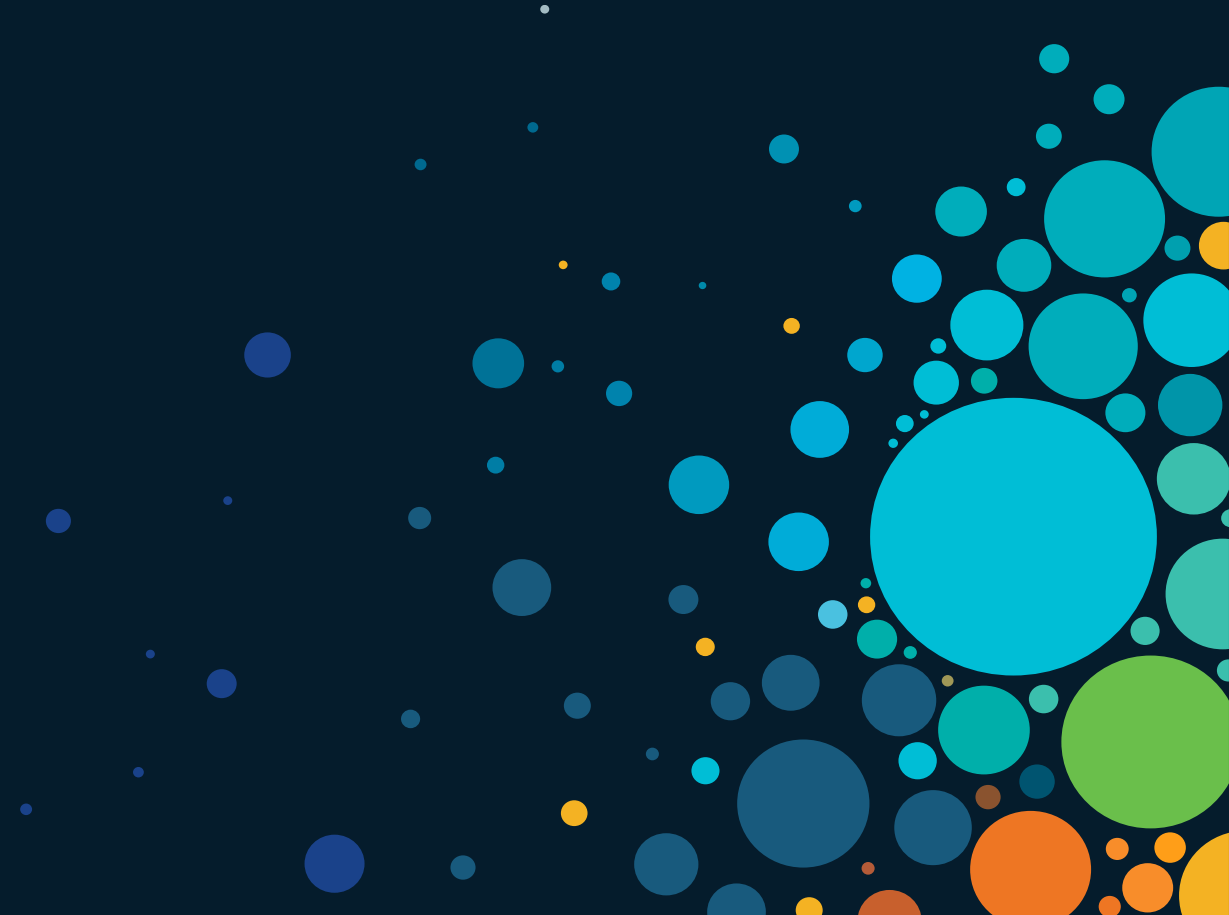
# Cisco IOx - Summary

- Cisco IOx
  - is short for “Cisco IOS + **Linux**”
  - allows you to host **custom applications**
  - grants your application a share of the device-resources
  - provides **access to subsystems** and subtended devices
  - is being supported on many devices from the Cisco portfolio

- Applications
  - can be created in VM-style or Docker-style
  - can be managed via CLI, IoT OD or Local-Manager

See: https://www.cisco.com/c/en/us/products/cloud-systems-management/iox/index.html

# What is a DevNet Sandbox?

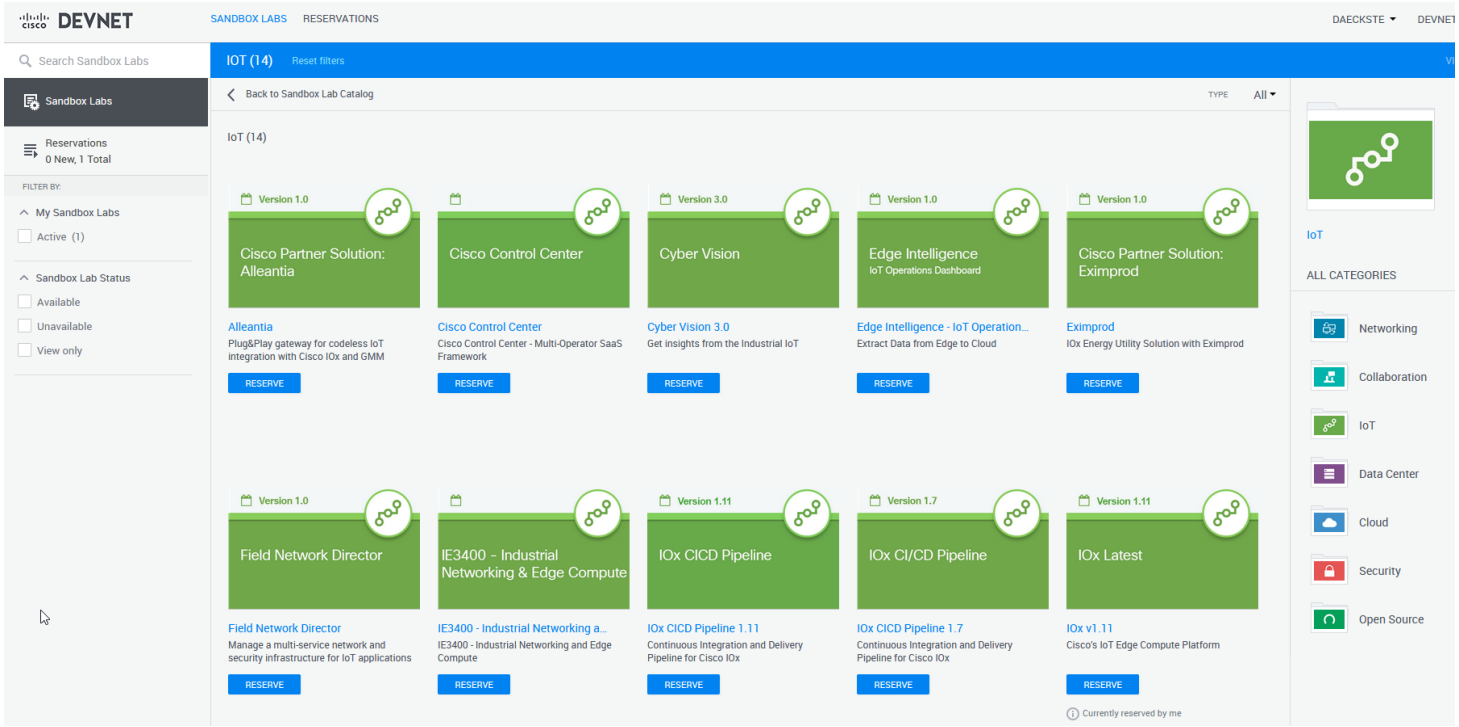


# Cisco DevNet

- DevNet supports Developers with various resources


- DevNet covers all areas of Cisco Business

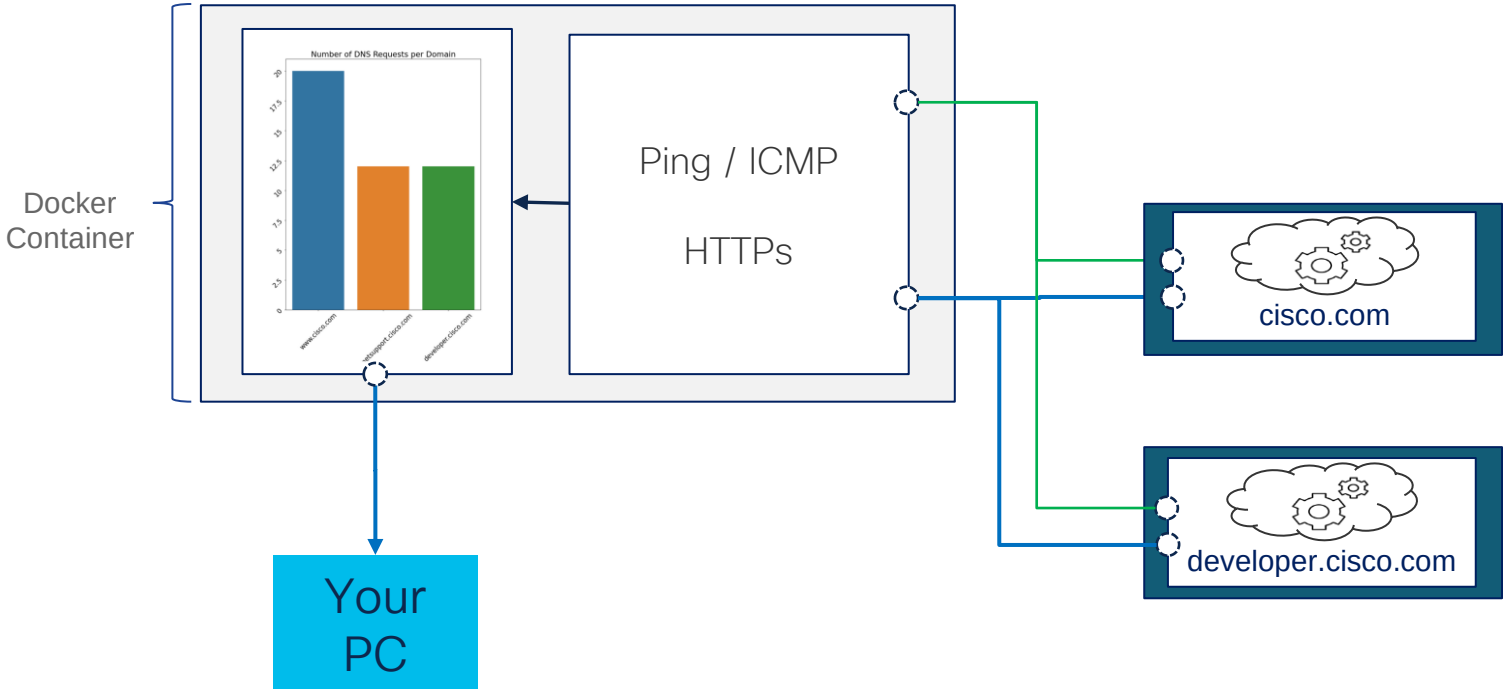
# Cisco DevNet - Sandbox



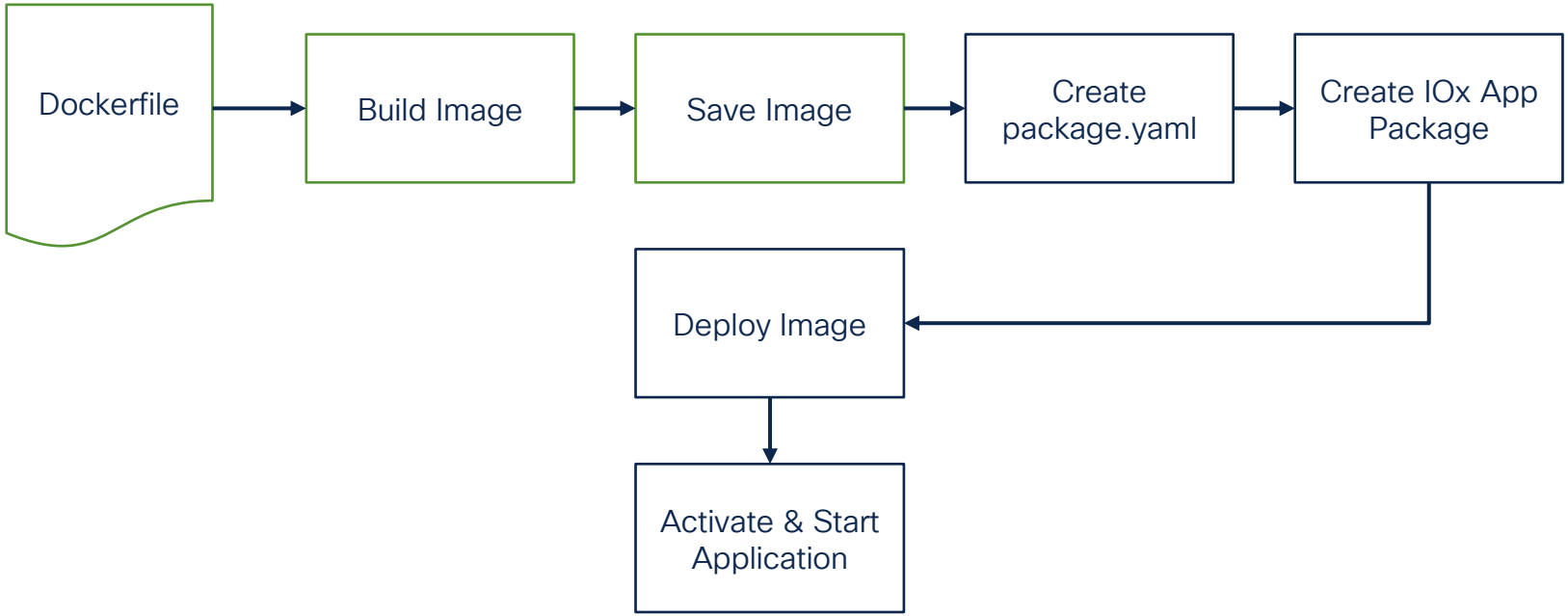

See: https://devnetsandbox.cisco.com

# Let’s prepare and install your application!

# About your application for today



# Workflow to create your Docker application




package.yaml: https://developer.cisco.com/docs/iox/#!package-descriptor

# Your application internals

```
FROM alpine:latest AS build

RUN apk update && \
    apk add make g++ jpeg-dev blas-dev blas openblas openblas-dev python3 py3-pip libxml2-dev libxslt-dev gcc libxml2 python3-dev linux-headers musl-dev  && \
    apk add py3-matplotlib py3-wheel py3-numpy py3-scipy py3-pandas && \
    pip3 install pyshark seaborn && \
    mkdir -p /data/appdata
```

```
FROM alpine:latest

RUN apk update && \
    apk add python3 wireshark-common tshark

COPY --from=build /usr/lib/python3.8/site-packages/ /usr/lib/python3.8/site-packages/
COPY --from=build /usr/lib/libxml2.so.2 /usr/lib/
COPY --from=build /usr/lib/libxslt.so.1 /usr/lib/
COPY --from=build /usr/lib/libexslt.so.0 /usr/lib/
COPY --from=build /usr/lib/libgcrypt.so.20 /usr/lib/
COPY --from=build /usr/lib/libgpg-error.so.0 /usr/lib/
COPY --from=build /usr/lib/libopenblas.so.3 /usr/lib/
COPY --from=build /usr/lib/libgfortran.so.5 /usr/lib/
COPY --from=build /usr/lib/libgcc_s.so.1 /usr/lib/
COPY --from=build /usr/lib/libfreetype.so.6 /usr/lib/
COPY --from=build /usr/lib/libstdc++.so.6 /usr/lib/
COPY --from=build /usr/lib/libpng16.so.16 /usr/lib/
COPY --from=build /usr/lib/libbrotlidec.so.1 /usr/lib/
COPY --from=build /usr/lib/libbrotlicommon.so.1 /usr/lib/
COPY --from=build /usr/lib/libjpeg.so.8 /usr/lib/
COPY --from=build /usr/lib/libopenjp2.so.7 /usr/lib/
COPY --from=build /usr/lib/libimagequant.so.0 /usr/lib/
COPY --from=build /usr/lib/libtiff.so.5 /usr/lib/
COPY --from=build /usr/lib/libxcb.so.1 /usr/lib/
COPY --from=build /usr/lib/libXau.so.6 /usr/lib/
COPY --from=build /usr/lib/libXdmcp.so.6 /usr/lib/
COPY --from=build /usr/lib/libbsd.so.0 /usr/lib/
COPY *.py *.sh *.html /data/appdata/
RUN addgroup root wireshark

EXPOSE 8080

CMD ["/bin/sh","/data/appdata/start.sh"]
```

- It is a regular Dockerfile
- Example available via github

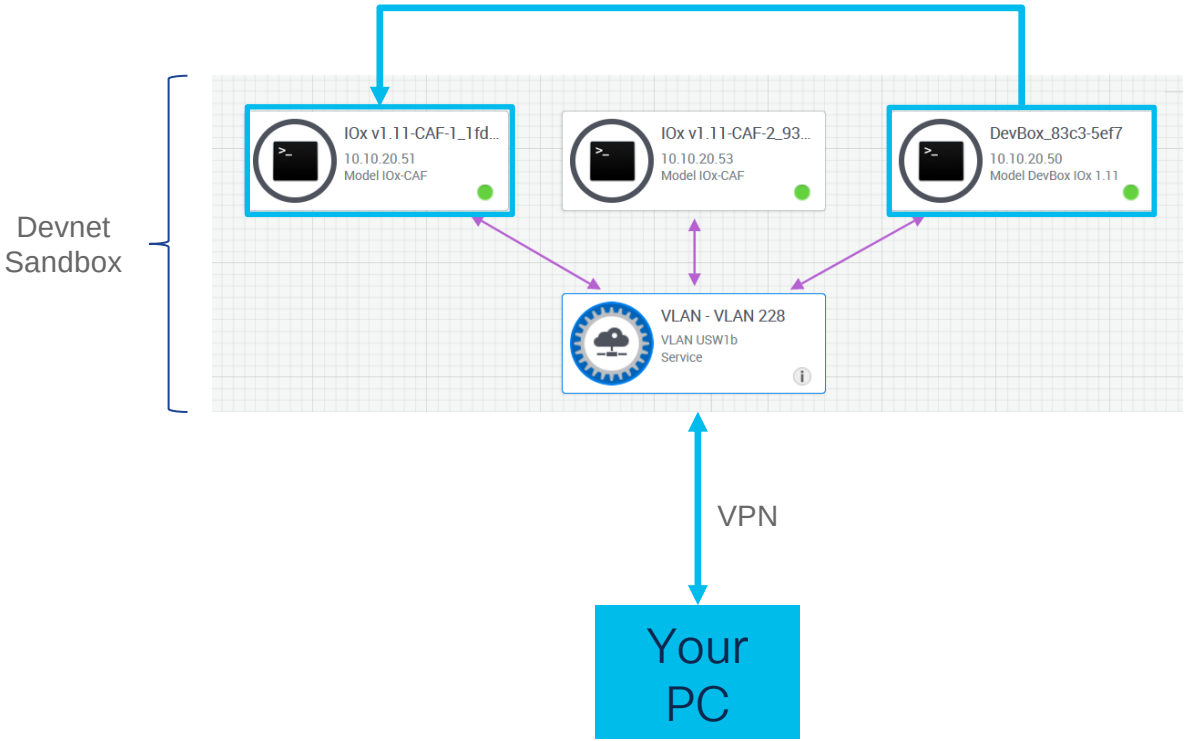
# What we heard so far ...

- **Cisco DevNet** provides you resources for education, exploration and testing
- **Cisco IOx** provides you the capability to host your application on Cisco devices
- Applications can be provided as Docker images

# Preparing and installing an application!

- The overall Setup
- Access your Sandbox
- Create your docker image
- Save your docker image
- Install your docker image to your IOx
- Access your running application

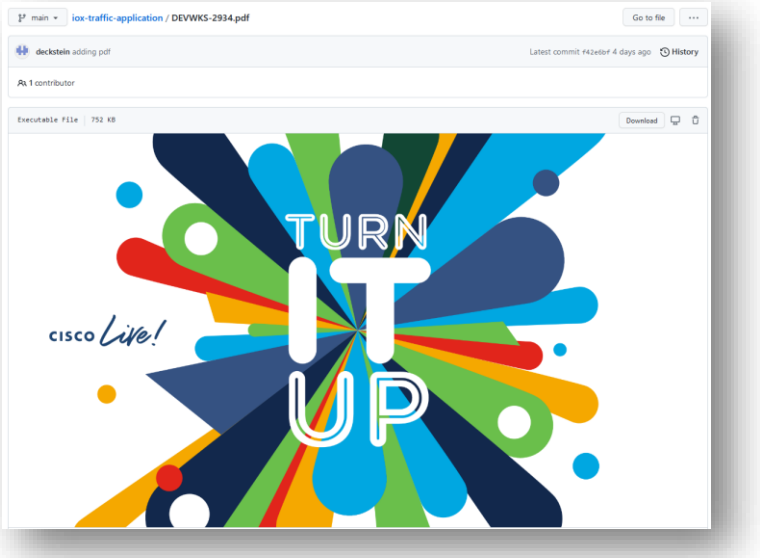
# The overall Setup



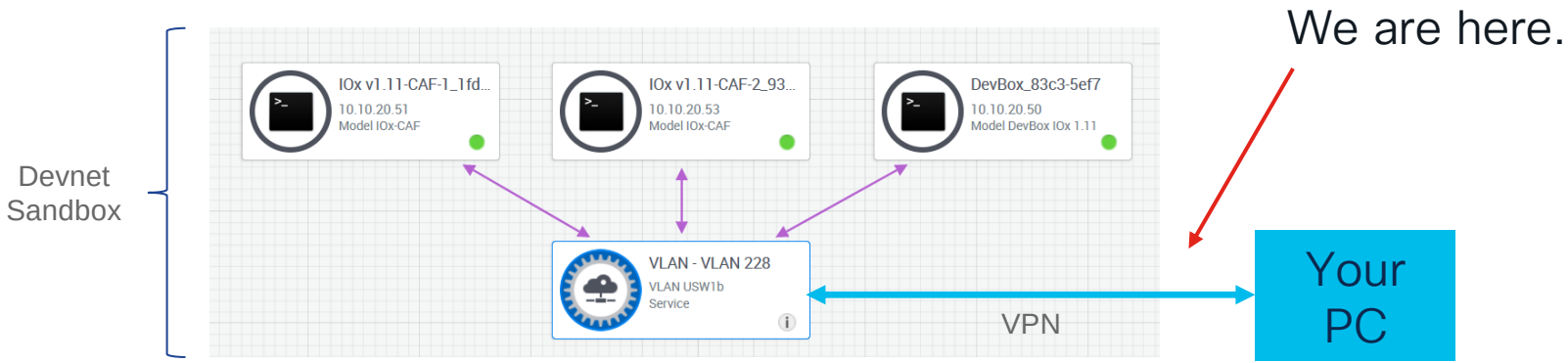

1. Get Access
2. Create Docker image
4. Create IOx application
5. Deploy your image
6. Start your application

# But before we start!

https://bit.ly/cl2022-iox



# Access your Sandbox



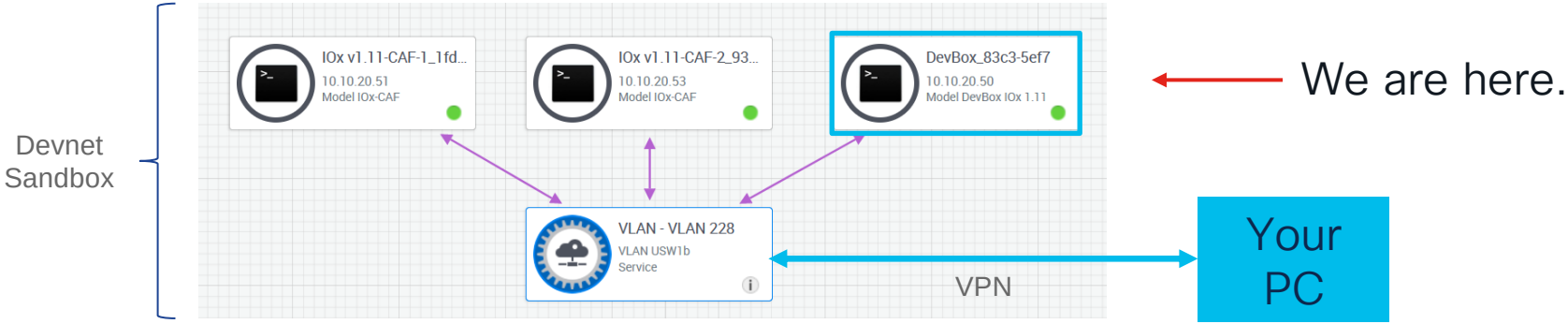

## Current Task:

Use Anyconnect to open a VPN connection to your sandbox.
Please use the **VPN credentials provided** here.

Use a terminal to log in: **ssh -l developer 10.10.20.50**

Password: **C1sco12345**

# Create your Docker Image




## Current Task:

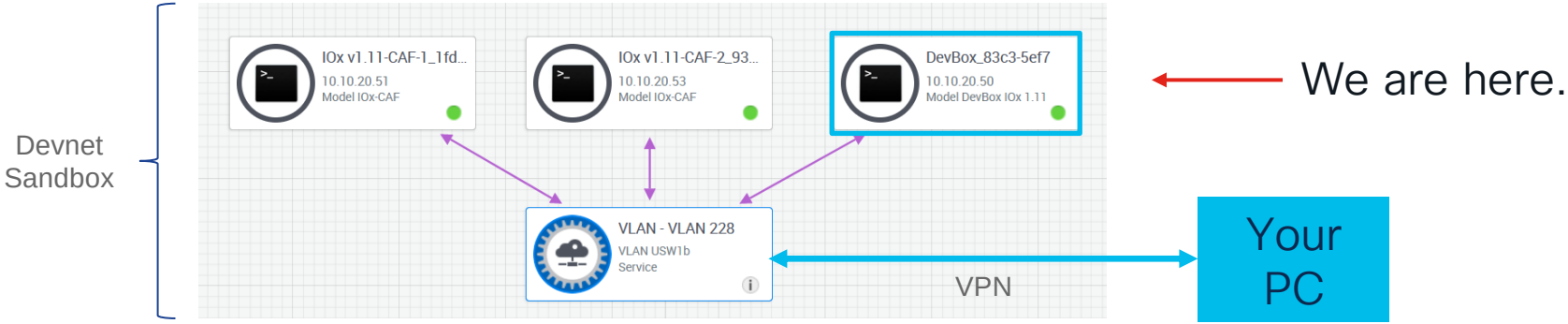
```
git clone https://github.com/deckstein/iox-traffic-application

cd iox-traffic-application

docker build . --tag ioxapp

docker image ls
```

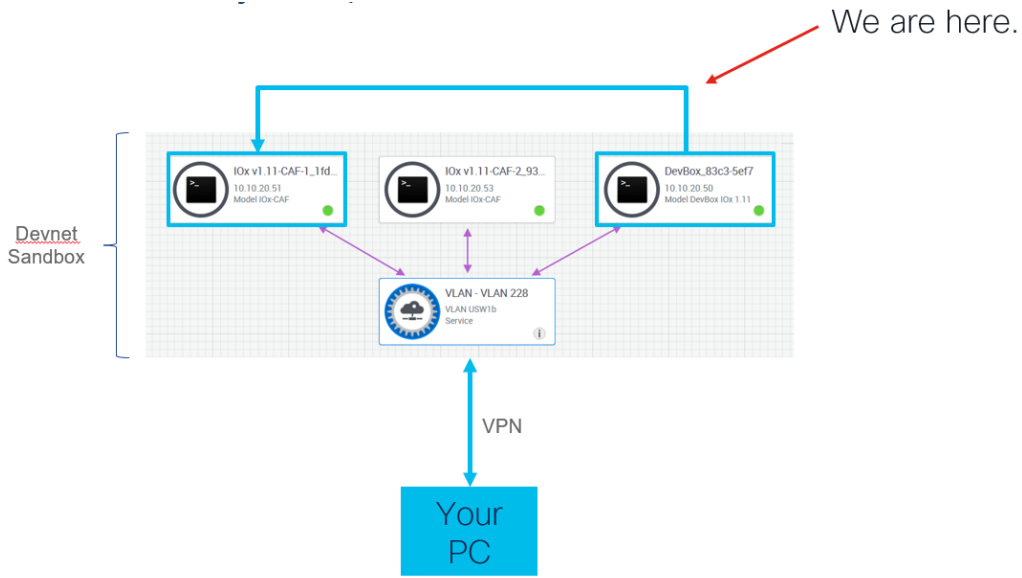
# Save your Docker Image




Current Task:

```
docker image save ioxapp -o ioxapp.tar
```

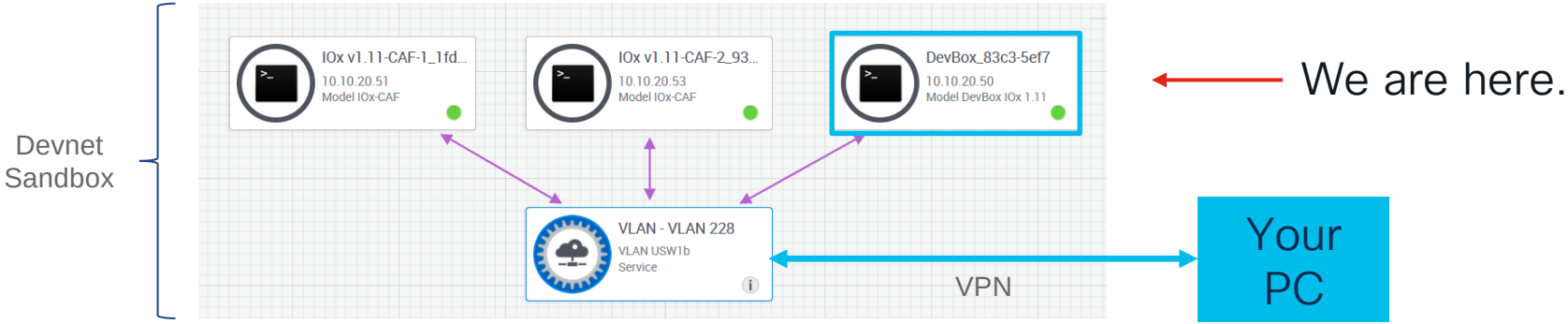
# Create your IOx profile




## Current Task:

**ioxclient**
Creating one time configuration.
Your / your organization's name : CLUS22
Your / your organization's URL :
Your IOx platform's IP address[127.0.0.1] : 10.10.20.51
Your IOx platform's port number[8443] :
Authorized user name[root] :
Password for root : cisco123
Local repository path on IOx
platform[/software/downloads]:
URL Scheme (http/https) [https]:
API Prefix[/iox/api/v2/hosting/]:
Your IOx platform's SSH Port[2222]:
Your RSA key, for signing packages, in PEM format[]:
Your x.509 certificate in PEM format[]:
Activating Profile  default
Saving current configuration

# Create your IOx application package




Current Task:

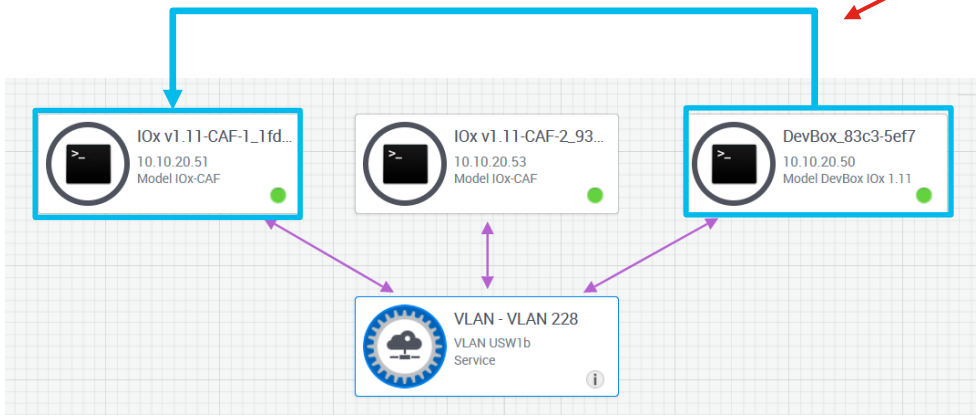
```
ioxclient docker package ioxapp.tar package/
```

https://bit.ly/cl2022-iox

# Deploy your IOx application package

We are here.

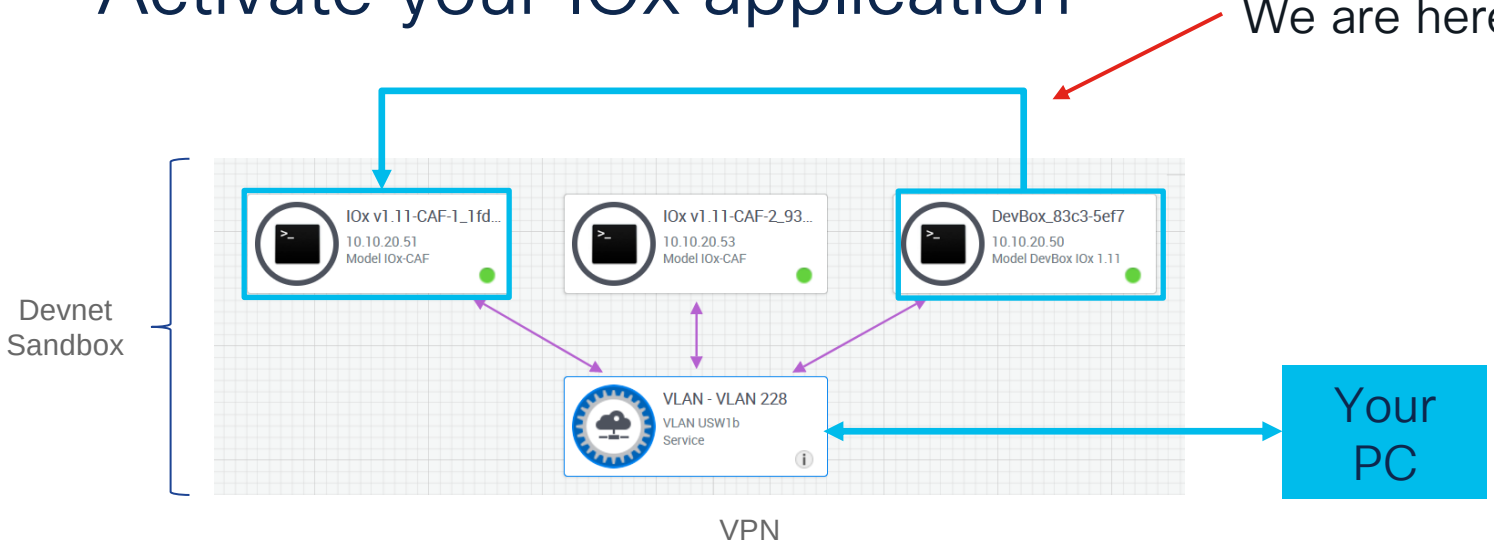
Devnet Sandbox




Current Task:

```
ioxclient --profile CLUS22 application install ioxapp package/package.tar
```

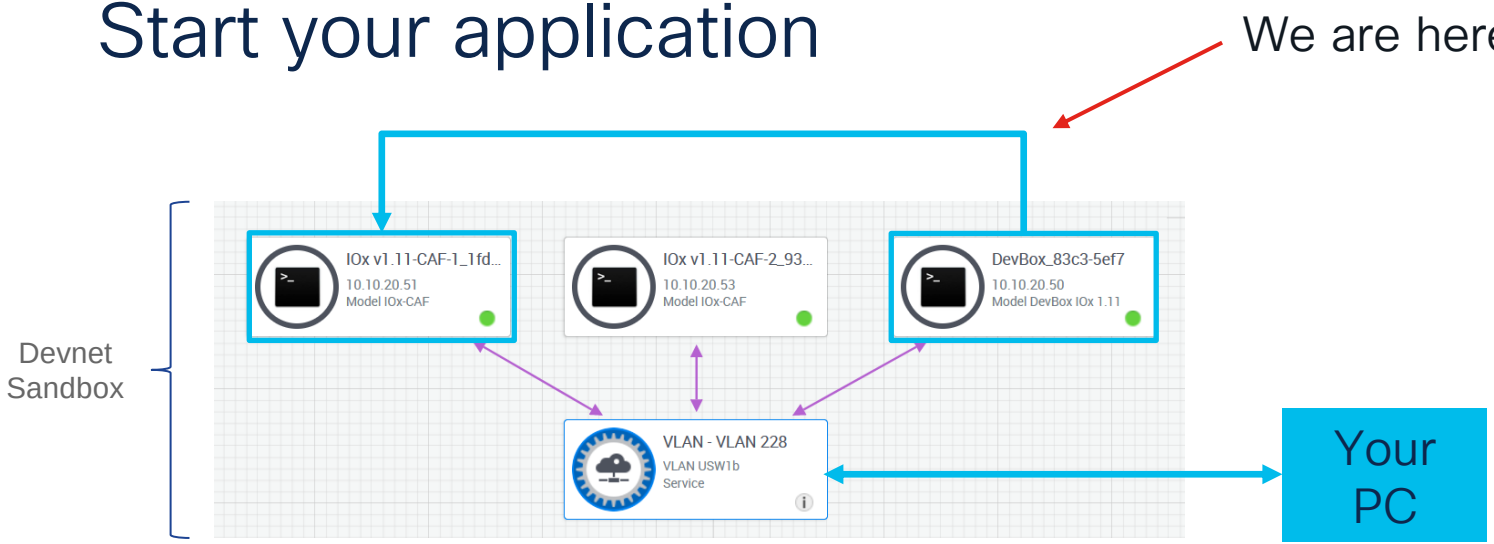
# Activate your IOx application




## Current Task:

```
ioxclient --profile CLUS22 application activate ioxapp --docker-opts "-p 8080:8080 --dns 10.17.248.11" --payload activation.json
```

# Start your application



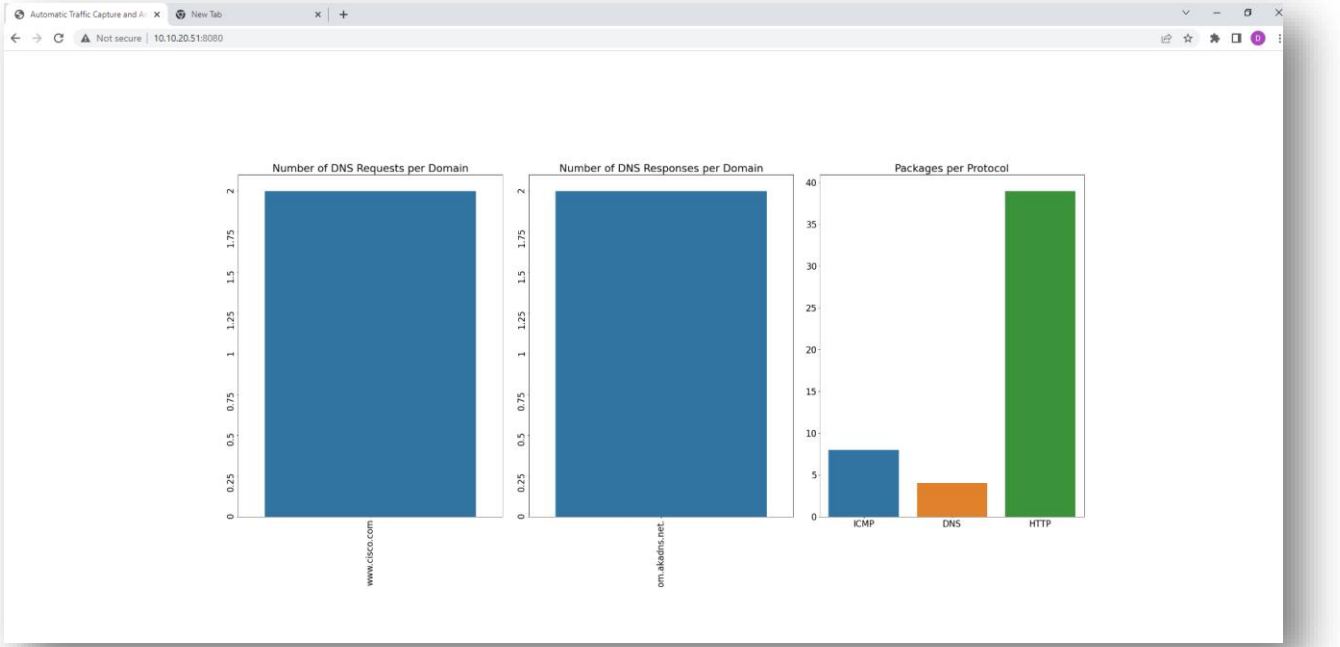

## Current Task:

```
ioxclient --profile CLUS22 application start ioxapp
```

https://bit.ly/cl2022-iox

# Access your application

Point your browser to: http://10.10.20.51:8080/



# Troubleshooting

https://bit.ly/cl2022-iox

Visit: https://blogs.cisco.com/developer/ioxapplicationtroubleshooting01

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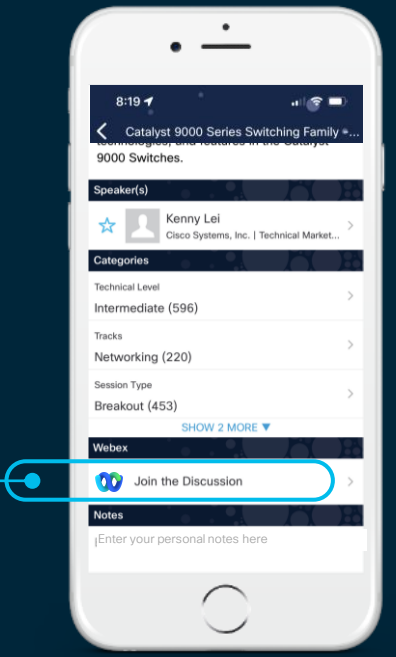
## Questions?

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 17, 2022.




https://ciscolive.ciscoevents.com/ciscolivebot/#DEVWKS-2934


The bridge to possible
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