



DEVNET

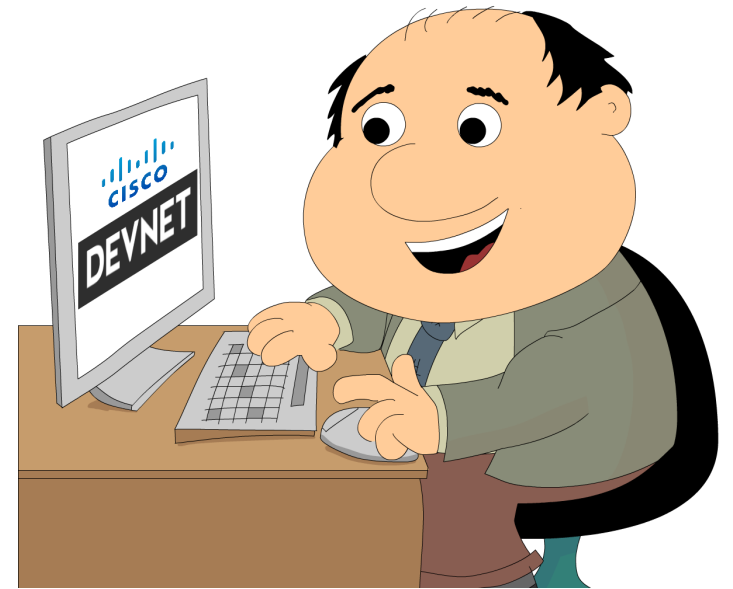
Cloud to Fog... Why Host Apps in the Network?

A Network Programmability Basics Presentation

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Developer Evangelist
@hfpreston 

Network Programmability Basics Modules

- Introduction: How to be a Network Engineer in a Programmable Age
- Programming Fundamentals
- Network Device APIs
- Network Controllers
- **Application Hosting and the Network**
- NetDevOps



Network Programmability Basics: The Lessons

Module: Application Hosting and the Network

- **Cloud to Fog... Why Host Apps in the Network**
- Linux at the Edge: Introduction to Guest Shell
- Python at the Edge: Super Charged Network Event Management
- Package, Deploy and Run Applications in the Network with IOx

Code and Develop Along

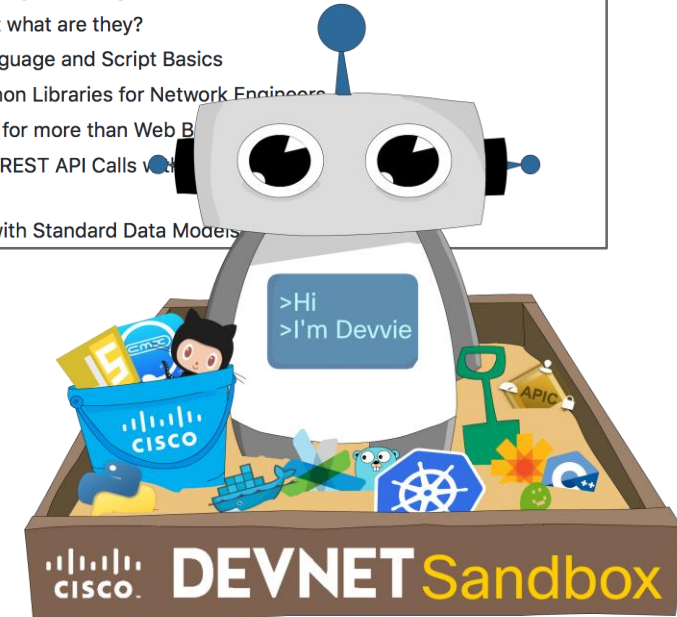
- Get the Code!
 - github.com/CiscoDevNet/netprog_basics
- Setup Lab Prerequisites
 - Each lab includes a README with details
- Access to Infrastructure
 - [DevNet Sandbox](#)
 - Specifics in lab README

Network Programmability Basics

Code, Examples, and Resources for the Network Programmability Basics Video Course

Table of Contents

- **Programming Fundamentals**
 - Data Formats: Understanding and using JSON, XML and YAML
 - APIs are Everywhere... but what are they?
 - Python Part 1: Python Language and Script Basics
 - Python Part 2: Useful Python Libraries for Network Engineers
 - REST APIs Part 1: HTTP is for more than Web Browsers
 - REST APIs Part 2: Making REST API Calls with Python
- **Network Device APIs**
 - Getting the "YANG" of it with Standard Data Models



Topics to Cover

- Why would I run apps in the network?
- Edge Application Hosting Use Cases
- Cisco Application Hosting Technologies

Why would I run apps in the network?

Current Application Challenges

Not enough network bandwidth



Data Reduction

Most of the data is not interesting



Filtering

The use of data may be at the edge



Latency Optimization

Computation can be optimized for some purposes



Partitioning

Data normalization



Application Simplification

Data redirection based on the content of the data



Dynamic Changes

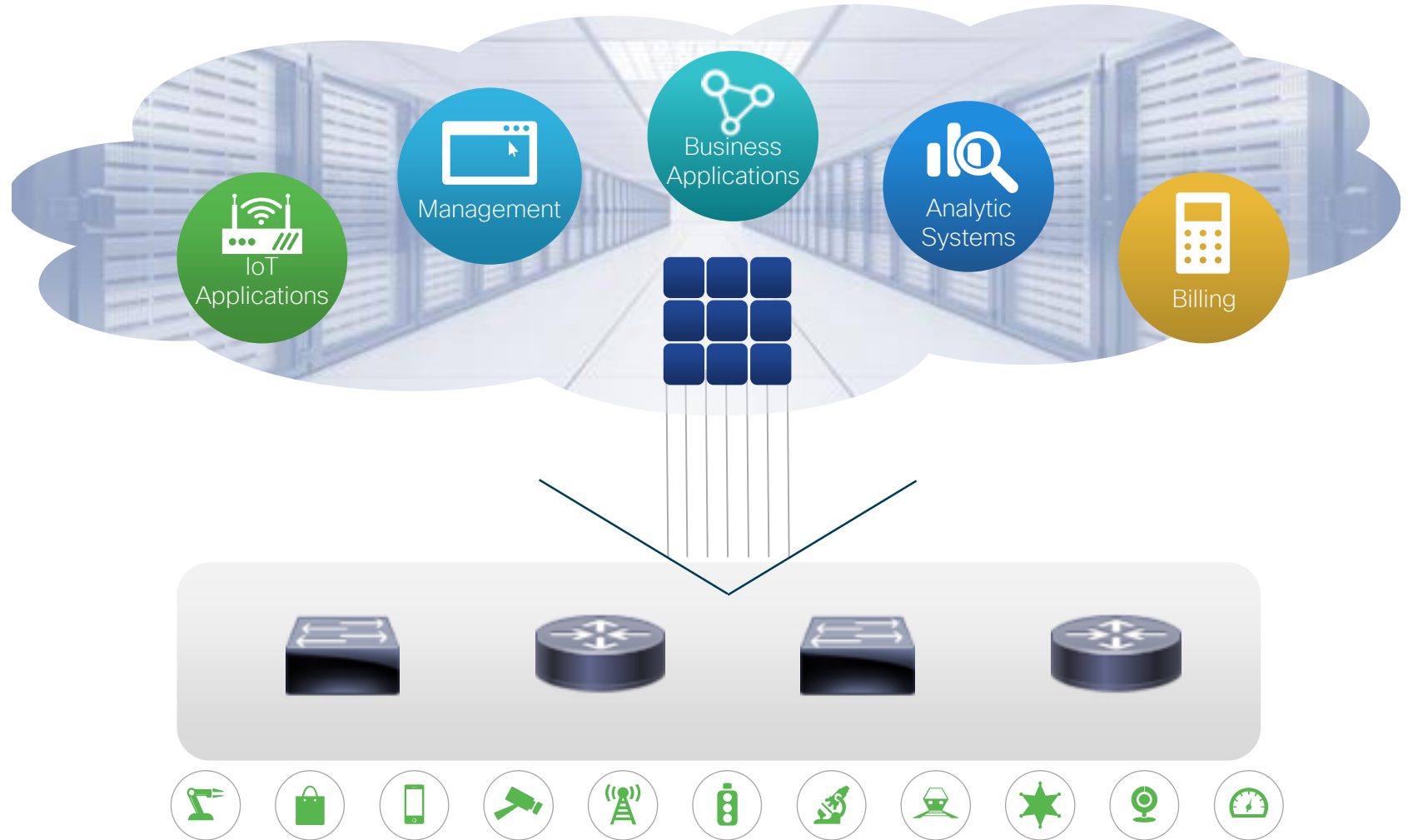
Data time stamping, algorithmic ownership



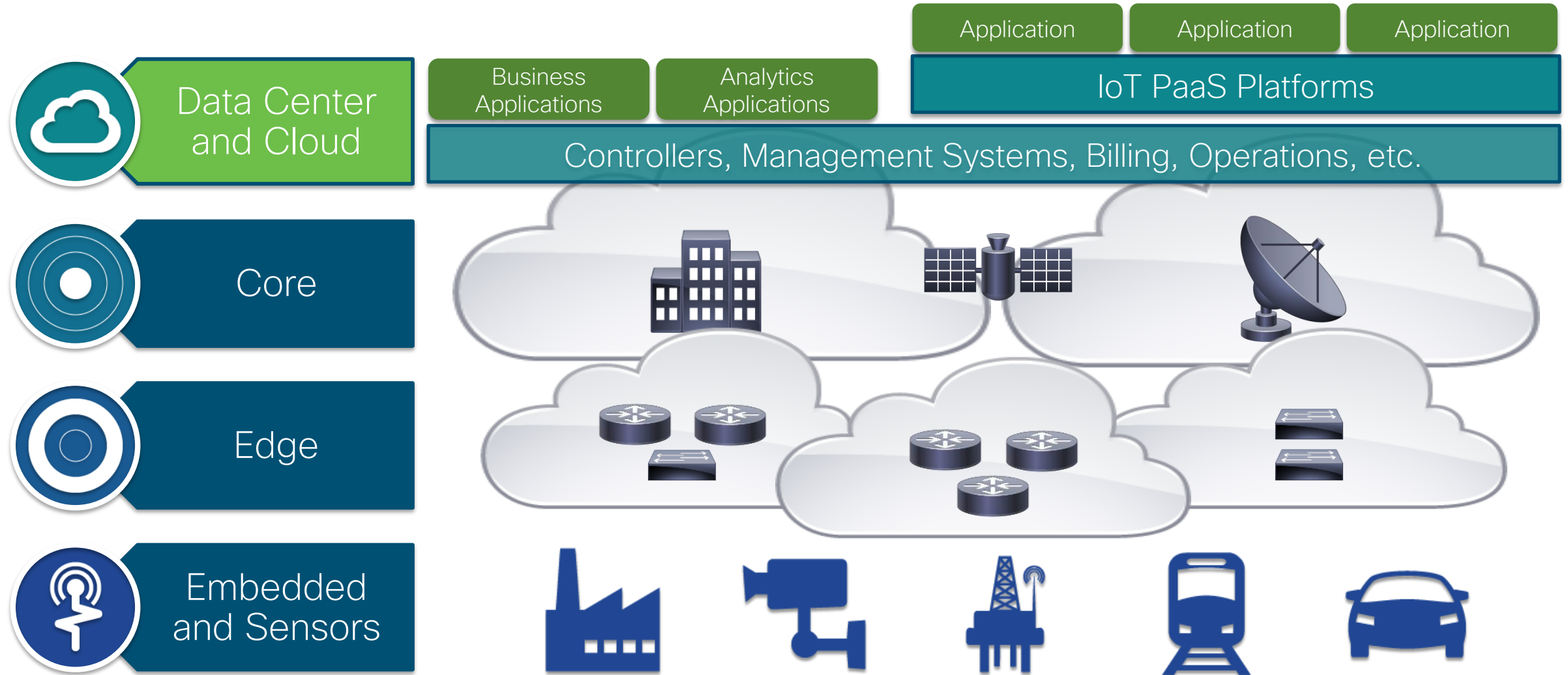
Analytic Support

Empowering the Edge – Leverage the Network!

- Existing hardware footprint
- No need for separate compute machinery
- Integrated security
- Reduced latency & bandwidth cost



Fog Computing Architecture



Edge Application Hosting Use Cases

Who wants to run apps in the network?



Infrastructure Engineers

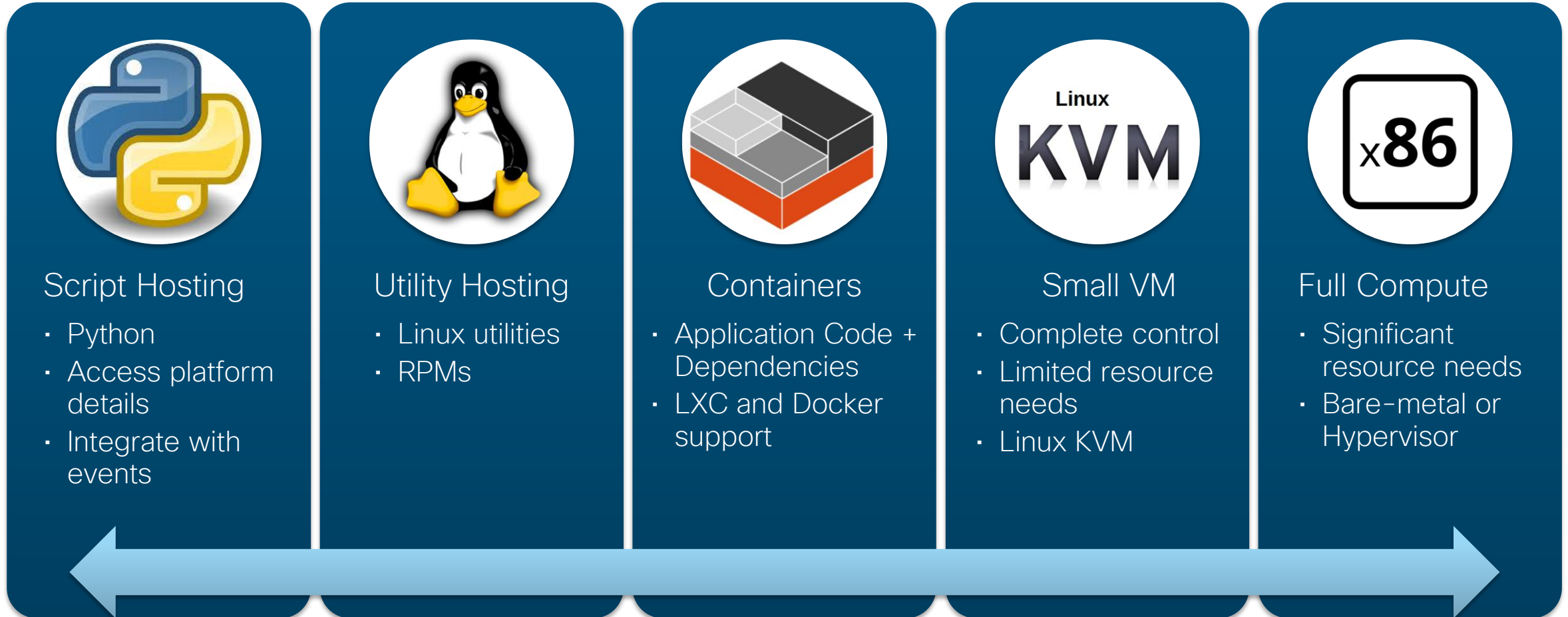
- Configuration and operations management
- Python scripts
- Linux Utilities



Application Developers

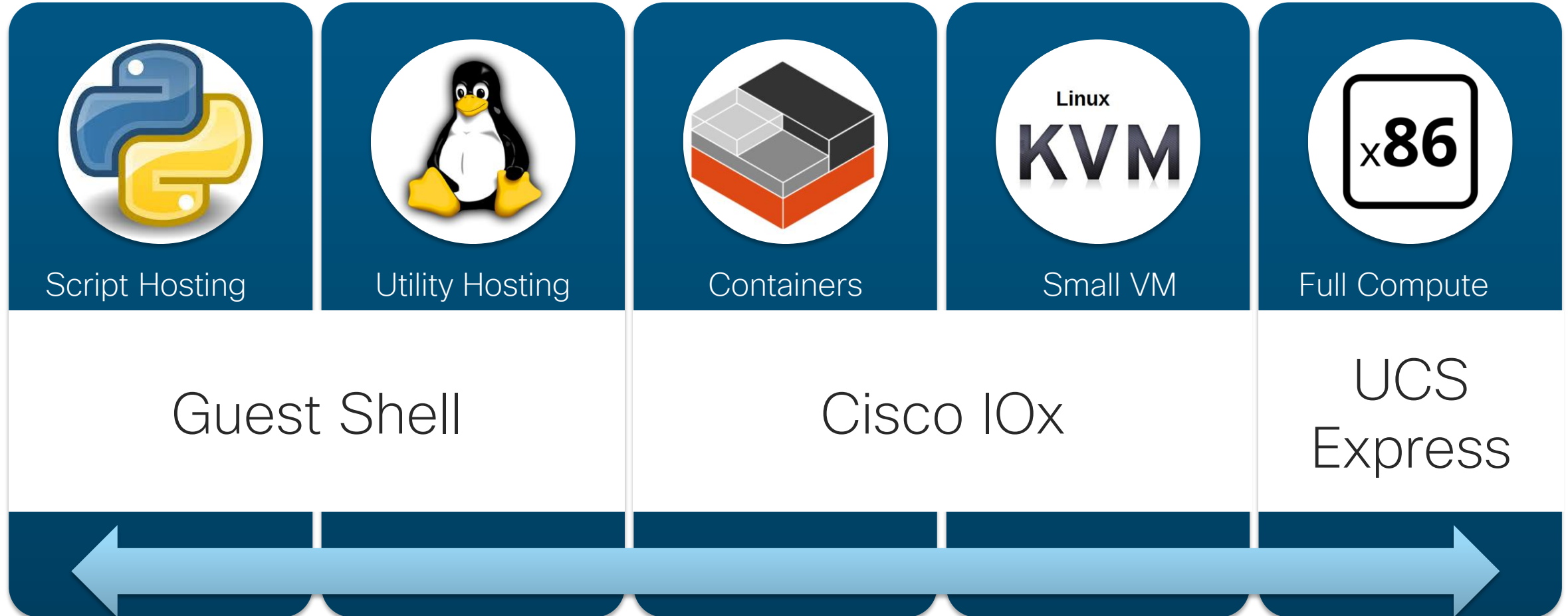
- Distributed Applications
- IOT Applications
- VMs and/or Containers

Network Application Hosting Spectrum



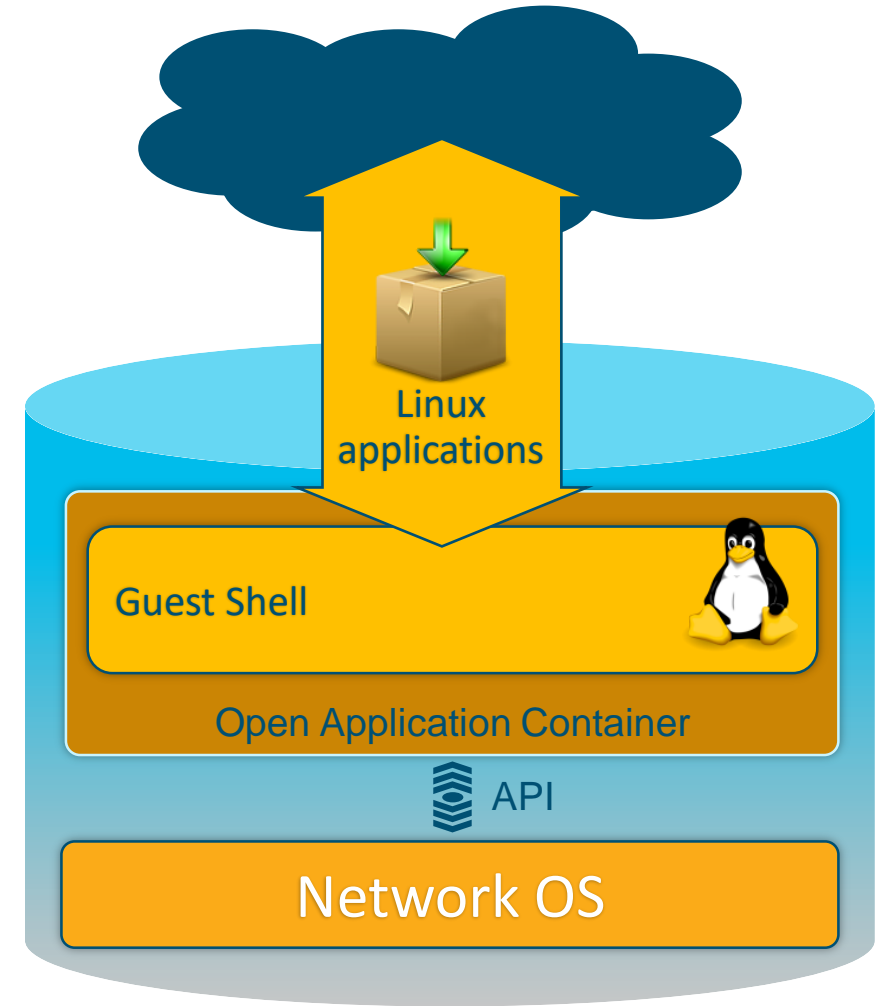
Cisco Application Hosting Technologies

Cisco Application Hosting Technologies



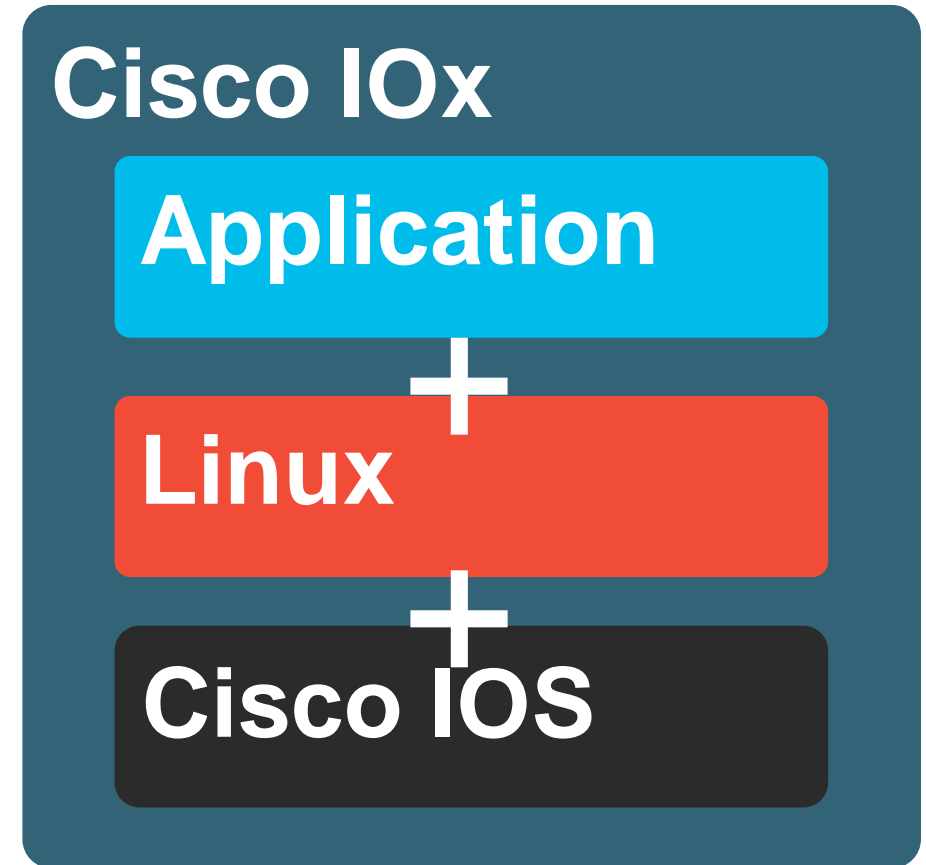
What is the Guest Shell?

- 64-bit Linux environment running on IOS XE and NX-OS platforms
- Install, update, and operate 3rd party Linux apps (e.g. Puppet, Chef, Splunk)
- Bundled with Python
- Intended for agent or script hosting



What is Cisco IOx?

- Host applications and services at the network edge across different hardware platforms
- A compute platform, application framework, and software development kit
- Manage life cycle aspects of applications



What is Cisco UCS Express

- Cisco UCS Blade server installed and running in router/switch
- Bare-metal or hypervisor operating systems supported
- Independent server management (from network)



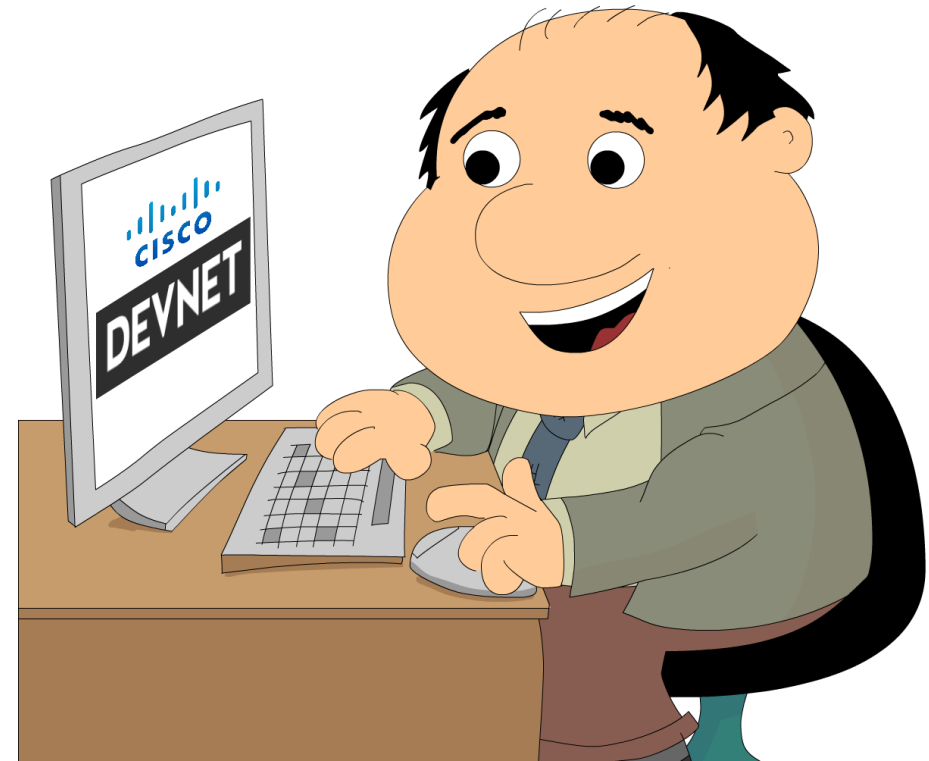
Summing up

Review

- Considered why you may want to run applications in the network.
- Discussed some of the uses cases and spectrum of deployment options available.
- Introduced the different technologies from Cisco to support application hosting at the edge.

Call to Action!

- Complete the full **Network Programmability Basics** Course
- Run the examples and exercises yourself!
 - Bonus Examples!
- Join [DevNet](#) for so much more!
 - [Learning Labs](#)
 - [Development Sandboxes](#)
 - Code Samples and API Guides



Got more questions? Come find me!

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