

# Emerging Technologies Workshops

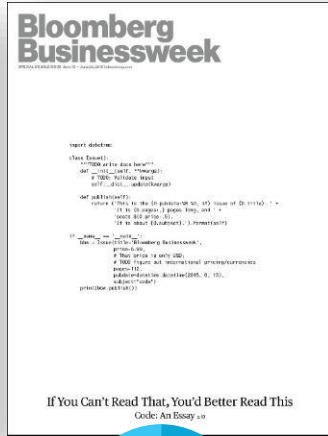


# NetAcad Focus in Response



Everything becomes connected

Networking



Everything becomes software-based

Programmability



Everything generates data



Everything can be automated

Security



Everything needs to be secured

# Emerging Technologies Workshops

Increase Employability by Building Breadth in the T-Shaped Professional

The  
Networking  
Academy  
Learning  
Portfolio  
Approach

21<sup>st</sup> Century Digital Skills

Many Disciplines

Many Systems

Deep in at  
Least One  
Discipline

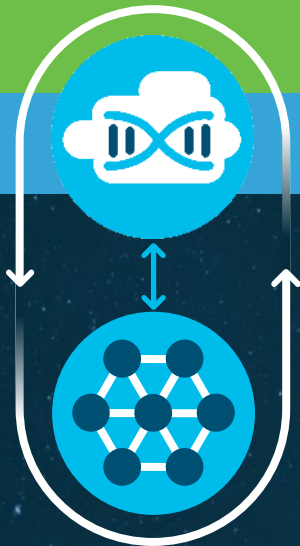
Deep in at  
Least One  
System

● Foundational

# NetAcad Offering Comparison

| Component                     | NetAcad Foundational & Career-Ready Courses                | Emerging Technologies Workshops  |
|-------------------------------|--|--|
| Curriculum Instructional Goal | Gateway to Entry-level Networking and IT careers           | Take students from Buzzwords to Hello World on latest technologies                                 |
| Instructional Hours           | 30-70 hours  | 8 hours  |
| Hands-on Labs                 | Real equipment in the classroom, Packet Tracer simulations | Hands-on experience on enterprise software using Cisco online platforms and Cisco DevNet sandboxes |
| Assessments                   | Formative, Performance-based, Comprehensive summative      | Formative, Short summative   |
| Instructor Resources          | Instructor PPTs  | Instructor PPTs + Activity Transcript  |

# Cisco DNA & Emerging Tech Workshops



## Emerging Technologies Workshop Experimenting with REST APIs using Webex Teams

### Workshop Overview

The Experimenting with REST APIs using Cisco Spark workshop introduces you to the basic competencies needed to create applications and automate tasks using REST APIs, the most popular architecture for software integration in IT.

### Benefits

In one day students will learn and practice Python programming skills and tasks, culminating in live interactions with the APIs on Cisco collaboration software using the Cisco Spark online platform.

### Learning Outcomes

- Understand value, set-up and use the most prevalent software language (Python) and tools for network programmability.
- Join and engage in 3 professional communities of practice: GitLab, Stack Overflow and Cisco DevNet.
- Describe the relevance of REST APIs architecture and perform basic software integration and automation using real-world APIs on an enterprise collaboration platform (Cisco Spark).
- Understand the importance of participating in professional communities of practice when doing work in the software domain.



### Features

**Target Audience:** Vocational, 2-year and 4-year College, 4-Year University students  
**Prerequisites:** Basic programming  
**Languages:** English  
**Course Delivery:** Instructor-led  
**Equipment:** FREE! Uses free online software tools  
**Estimated Time to Complete:** 4 hours  
**Recommended Insertion Points:** PCAP Programming Essentials in Python, Connecting Things  
**Other Insertion Points:** IT Essentials, CCNA RAS ITN  
**Instructor Training:** Required, self-paced options available

## Emerging Technologies Workshop Network Programmability with Cisco APIC-EM

### Workshop Overview

The Network Programmability with Cisco APIC-EM workshop introduces you to the basic competencies to operate and automate management tasks on a controller-based network.

### Benefits

In this workshop, students will learn and practice Python programming skills and tasks, culminating in live interactions with the APIs on Cisco programmable controllers using the Cisco DevNet Sandbox.

### Learning Outcomes

- Understand the value, set-up and use of software concepts and tools relevant to network programmability (Python scripting, Git, JSON, Postman, APIs).
- Use the Cisco DevNet Sandbox to learn how to interact with programmable devices using real-world APIs on Cisco APIC-EM programmable controllers.
- Understand the value of joining professional communities of practice to working in the network programmability domain. Participate in Cisco DevNet, GitLab, and Stack Overflow.



### Features

**Target Audience:** Vocational, 2-year and 4-year College, 4-year University students  
**Prerequisites:** Basic programming, CCNET level networking  
**Languages:** English  
**Course Delivery:** Instructor-led  
**Equipment:** FREE! Uses free online software tools  
**Estimated Time to Complete:** 4 hours  
**Recommended Insertion Points:** After CCNA RAS course 2, with CCNA Security or COMP RAS  
**Instructor Training:** Required, self-paced option available

# Emerging Technologies Workshop

## Network Programmability with Cisco APIC-EM

### Workshop Overview

The Network Programmability with Cisco APIC-EM workshop introduces you to the basic competencies to operate and automate management tasks on a controller-based network.

### Benefits

In this workshop, students will learn and practice Python programming skills and tools, culminating in live interactions with the APIs on Cisco programmable controllers using the Cisco DevNet Sandbox.

### Learning Outcomes

- Understand the value, set-up and use of software concepts and tools relevant to network programmability (Python scripting, Git, JSON, Postman, APIs).
- Describe a different approach to software-defined networking (SDN), including central application policy control.
- Use the Cisco DevNet Sandbox to learn how to interact with programmable devices using real-world APIs on Cisco APIC-EM programmable controllers.
- Understand the value of joining professional communities of practice to working in the network programmability domain.
- Participate in Cisco DevNet, GitHub, and Stack Overflow.

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### Features

**Target Audience:** Vocational, 2-year and 4-year College, 4-year University students

**Prerequisites:** Basic programming, CCENT level networking

**Languages:** English

**Course Delivery:** Instructor-led

**Equipment:** FREE! Uses free online software tools

**Estimated Time to Complete:** 8 hours

**Recommended Insertion Points:** After CCNA R&S course 2, with CCNA Security or CCNP R&S

**Instructor Training:** Required, self-paced option available



# Emerging Technologies Workshop

## Experimenting with REST APIs using Webex Teams

### Workshop Overview

The Experimenting with REST APIs using Webex Teams workshop introduces you to the basic competencies needed to create applications and automate tasks using REST APIs, the most popular architecture for software integration in IT.

### Benefits

In one day students will learn and practice Python programming skills and tools, culminating in live interactions with the APIs on Cisco collaboration software using the Webex Teams online platform.

### Learning Outcomes

- Understand value, set-up and use the most prevalent software language (Python) and tools for network programmability (JSON, Postman).
- Understand the importance of participating in professional communities of practice when doing work in the software domain.
- Join and engage in 3 professional communities of practice: GitHub, Stack Overflow and Cisco DevNet.
- Describe the relevance of REST APIs architecture and perform basic software integration and automation using real-world APIs on an enterprise collaboration platform (Webex Teams).

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### Features

**Target Audience:** Vocational, 2-year and 4-year College, 4-Year University students

**Prerequisites:** Basic programming

**Languages:** English

**Course Delivery:** Instructor-led

**Equipment:** FREE! Uses free online software tools

**Estimated Time to Complete:** 8 hours

**Recommended Insertion Points:** PCAP Programming Essentials in Python, Connecting Things

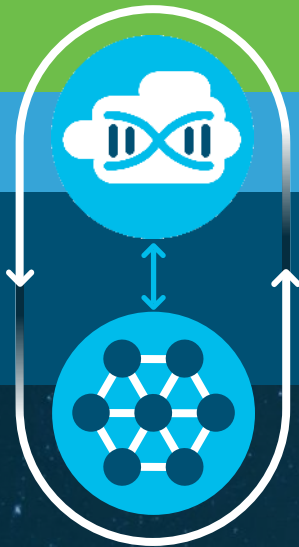
**Other Insertion Points:** IT Essentials, CCNA R&S ITN

**Instructor Training:** Required, self-paced options available

# Cisco DNA & Emerging Tech Workshops

Experimenting with REST APIs using Webex Teams

Network Programmability using Cisco APIC-EM



### Emerging Technologies Workshop Model Driven Programmability

**Workshop Overview**

With the increasing size of the modern network and the frequency of changes required by the business, managing and automating networks via a Command Line Interface (CLI) is ineffective and error prone. A new approach, using Model Driven Programmability, enables streamlined changes, by setting standardized device models and APIs. This workshop introduces students to device level programmability capabilities, to automate configuration and management tasks, using standardized YANG device models and using the RESTCONF and NETCONF device level APIs.

**Benefits**

Every networking student will benefit in adopting the capabilities of YANG, as language for "model" in networking devices, combined with the robustness of the RESTCONF and NETCONF device level programmability APIs. Students will also experiment and develop Python scripts to manage networking devices at scale, using the OpenStack OpenFlow controller approach.

**Learning Outcomes**

- Understand the value, capabilities and use of software concepts and tools relevant to network programmability (Python, RESTCONF, NETCONF, OpenStack, APIs).
- Describe a different approach to network management, including central application policy control.
- Use Python with combination of RESTCONF and NETCONF APIs to retrieve and update the device's configuration.
- Understand the value of existing professional communities, of particular relevance to the network programmability domain. Participants will learn from LinkedIn, Call Fire, and Stack Overflow.

**Features**

**Target Audience:** Undergrad, 2-year and 4-year College, 4-year University students.

**Prerequisites:** Basic programming, CCNA R&S Essentials level networking skills.


**Languages:** English

**Course Delivery:** Hands-on Lab Equipment, Virtual Cisco SW Router, DevNet Sandbox, or Real Equipment with Cisco IBSG licenses.

**Estimated Time to Complete:** 8 hours

**Recommended Prerequisites:** After CCNA R/S Essentials or CCNP R/S

**Instructor Training:** Required, self-paced options available



A photograph showing a group of people in a natural setting, possibly a forest or park, engaged in an outdoor activity. One person is visible in the foreground, looking towards the camera. The background shows trees and a path.



# Emerging Technologies Workshop

## Model Driven Programmability

### Workshop Overview

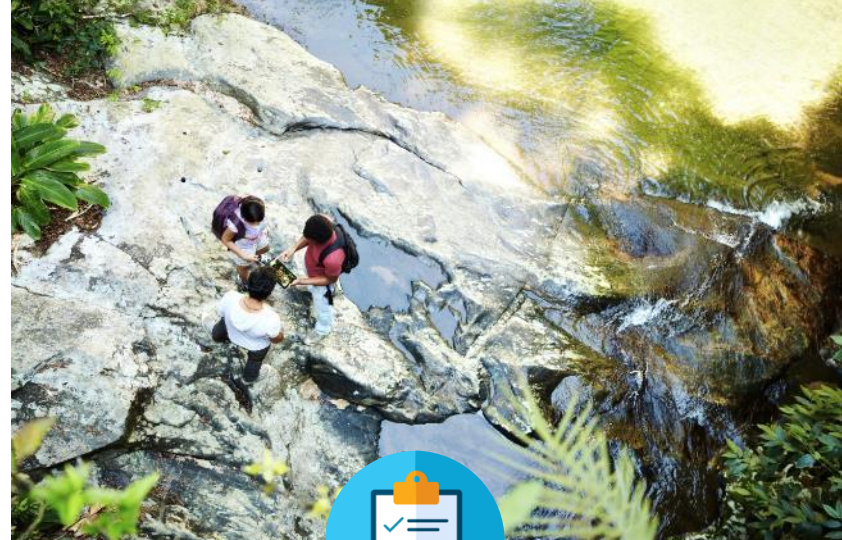
With the increasing size of the modern network and the frequency of changes required by the business, managing and automating networks via a Command Line Interface (CLI) is ineffective and error prone. A new approach, using Model Driven Programmability, enables transactional changes, by defining standardized device models and APIs. This workshop introduces students to device level programmability competencies, to automate configuration and management tasks using standardized YANG device models and using the RESTCONF and NETCONF device level APIs.

### Benefits

Every networking student will benefit in grasping the importance of YANG, as language to “model” a networking device, combined with the robustness of the RESTCONF and NETCONF device level programmability APIs. Students will also experiment and develop Python scripts to manage networking devices at scale, using the Model Driven Programmability approach.

### Learning Outcomes

- Understand the value, set-up and use of software concepts and tools relevant to network programmability (Python scripting, Git, JSON, Postman, APIs).
- Describe a different approach to software-defined networking (SDN), including central application policy control.
- Use Python with combination of RESTCONF and NETWORK APIs to retrieve and update the device's configuration
- Understand the value of joining professional communities of practice to working in the network programmability domain. Participate in Cisco DevNet, GitHub, and Stack Overflow.



### Features

**Target Audience:** Vocational, 2-year and 4-year College, 4-year University students

**Prerequisites:** Basic programming, CCNA R&S Essentials level networking skills

**Languages:** English

**Course Delivery:** Instructor-led

**Equipment:** Virtual Cisco SW Router, DevNet Sandbox, or Real Equipment with Cisco ISR4k routers

**Estimated Time to Complete:** 8 hours

**Recommended Insertion Points:** After CCNA R&S Essentials, or CCNP R&S

**Instructor Training:** Required, self-paced option available

# Equipment Required For The New Workshop

- 3 Flexibility Options:

1. Virtual Cisco SW Router

- Cisco CSR1000v software router
- Instructors need active NetAcad Maintenance access:

## Determining if you are Signed up

1. Login to Cisco.com
2. Click on your profile icon in the top right corner
3. Click Manage Profile
4. Click Access Management
5. Under "Your Current Access" you will see the following, "You may have been granted additional service and support access. See your current access"
6. Click "your current access"
7. Any contracts you have; NetAcad Maintenance = 95698496



2. DevNet Sandbox reservation

- Free, Remote using VPN.

3. Real Equipment with Cisco ISR4k routers

- Academies with new CCNA Bundles



## Lab – Setting Up the Lab Environment (Instructor Version)

**Instructor Note:** Red font color or gray highlights indicate text that appears in the instructor copy only.

### Objectives

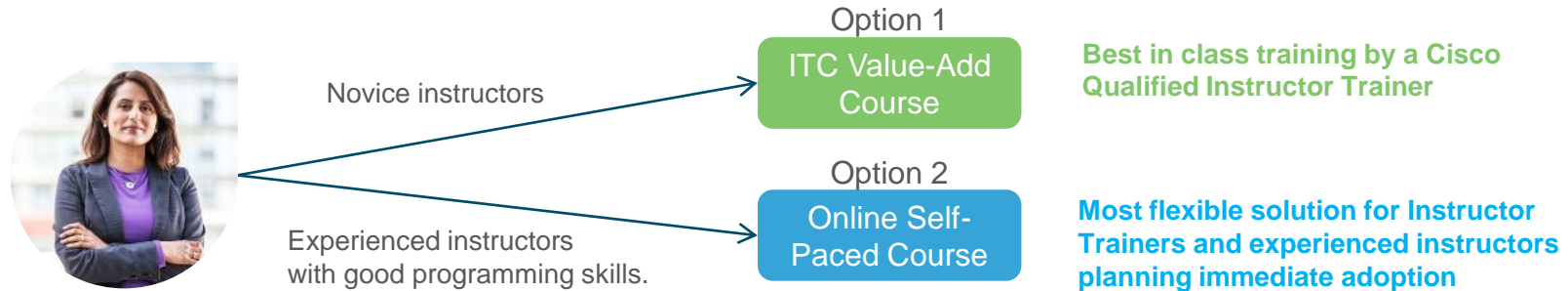
- Part 1 (Option 1): Import the VirtualBox VM with Cisco IOS-XE
- Part 1 (Option 2): Setup a Cisco ISR4k router with Cisco IOS-XE
- Part 1 (Option 3): Setup a DevNet Sandbox reservation with Cisco IOS-XE
- Part 2: Summary and Connection Details

### Required Resources

- For Part 1 Option 1:
  - Host computer with at least 4 GB of RAM and 15 GB of free disk space
  - Oracle VirtualBox
- For Part 1 Option 2:
  - Host computer with at least 2GB of RAM
  - Cisco ISR4221 or ISR4321 router with IOS-XE version 16.6 or above.
- For Part 1 Option 3:
  - Host computer with at least 2GB of RAM
  - Internet Connectivity

# How to access to the new workshop?

- Globally available as Alpha in Limited Availability to all instructors
  - Check the Course Resources page for updates: [www.netacad.com/portal/resources/course-resources](http://www.netacad.com/portal/resources/course-resources)
- Instructors can get their accreditation using the existing model for ETWs and IoTf:



- All accredited instructors will be able to immediately teach the workshop to their students.
- **Extend the skillset of your CCNA students with important network programmability skills today!**

Packet Tracer 7.3



# Packet Tracer 7.3

- Supports CCNA 7 & released together with CCNA 7
- New ISR 4331 router to support new topics
- New enhanced 3504 WLC wireless LAN controller
- Dynamic ARP Inspection (DAI)
- DHCP snooping fixes and enhancements
- Section output modifier for show commands
- Improved user authentication: when student takes online PTSA, authentication is not required
- Major GUI framework upgrade for better accessibility and usability



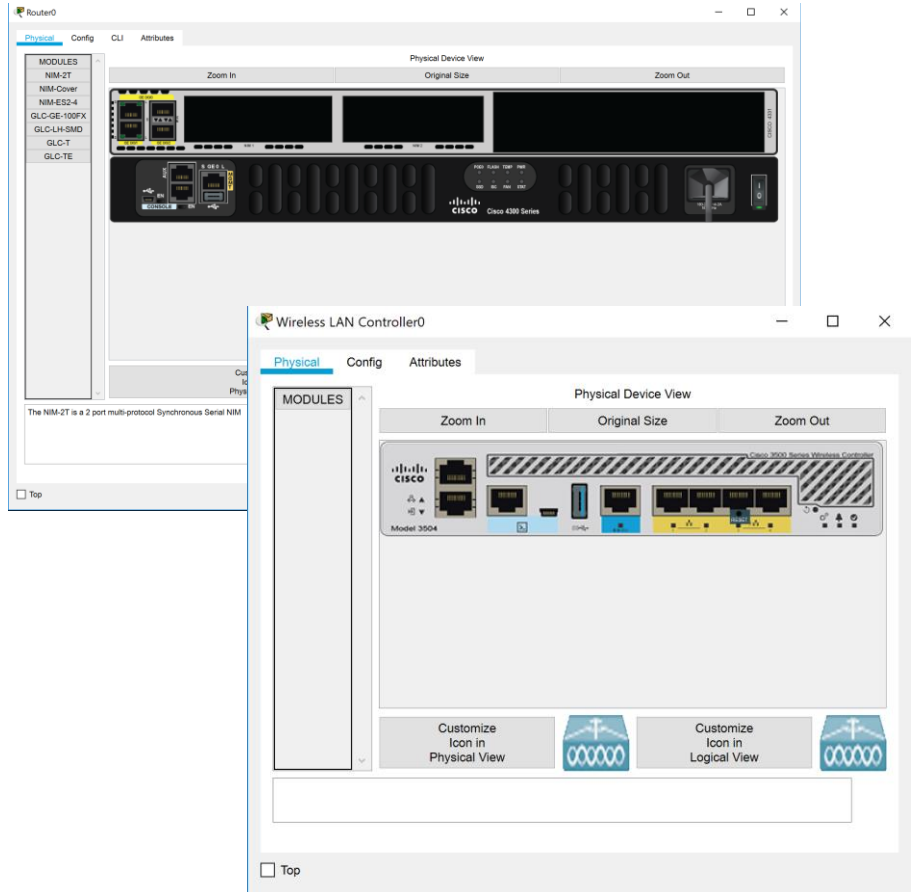
# New Devices Details

## Cisco 4331 ISR

- 1 GE/SFP, 1 GE, 1 SFP integrated WAN ports
- 2 NIM slots

## Cisco 3504 WLC

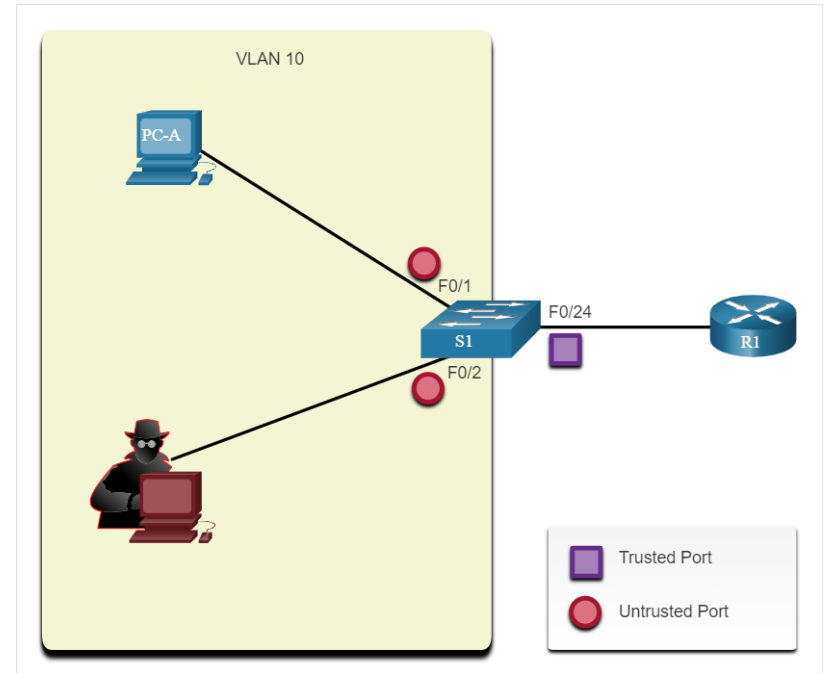
- Provides centralized control, management, and troubleshooting next-gen wireless networks



# What is DAI

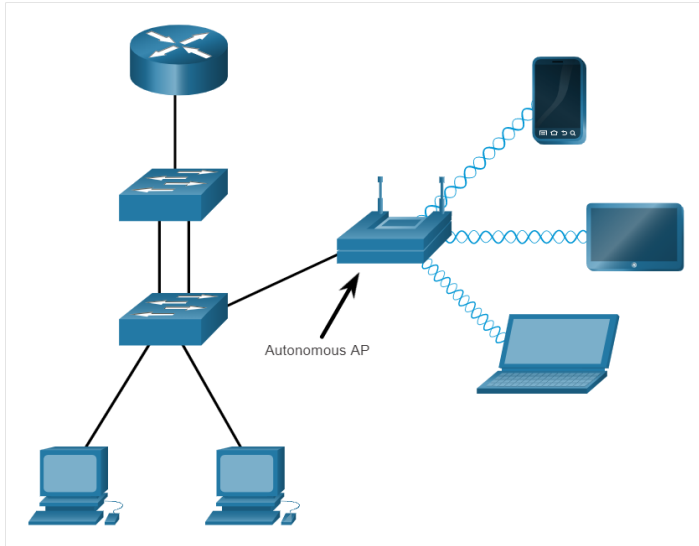
Dynamic ARP inspection (DAI) requires DHCP snooping and helps prevent ARP attacks by

- Not relaying invalid or gratuitous ARP Replies out to other ports in the same VLAN.
- Intercepting all ARP Requests and Replies on untrusted ports.
- Verifying each intercepted packet for a valid IP-to-MAC binding.
- Dropping and logging ARP Replies coming from invalid source to prevent ARP poisoning.
- Error-disabling the interface if the configured DAI number of ARP packets is exceeded.

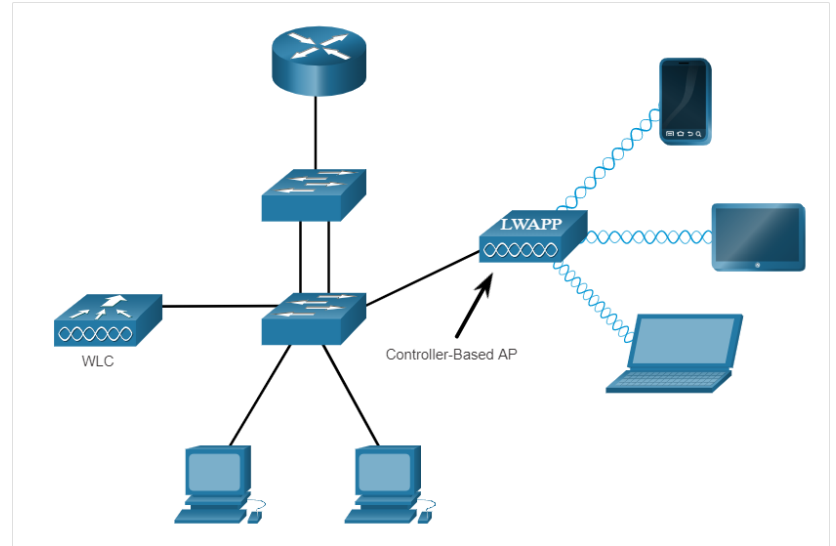


# Access Points Types

## Autonomous AP



## Controller-based APs





# Instructor Professional Development






# IPD Week 17 - 21 February



Cisco is pleased to confirm  
**Awesome Instructor**  
has attended 6 hours of continuing education by participating in  
**IPD Week, February 2020**  
hosted by the Technical Field Engagement Team  
17 - 21 February 2020

  
KAREN ALDERSON  
GLOBAL TECHNICAL MANAGER  
Corporate Affairs, Cisco

Recordings available!  
<http://cs.co/ipd20>

## Program Updates

- Catch up on the latest strategies and products from Cisco Networking Academy!

## Technical Session Topics Include:

- Understanding SD- Access
- Introduction to DevOps and CI/CD
- First Steps to DevNet Associate: Parsing JSON files using Python
- New Certs and Opportunities for our Academies: DevNet Associate
- Interactive Gaming in Packet Tracer
- Meraki Dashboard and API
- & many more!



# Dedicated CCNA 7 Page

## CCNA 7 – Technical Sessions



CCNAv7: Bridging Instructor Self-Enroll Course - This self-enroll course for instructors contains seven new content modules in CCNAv7, four Modules from SWRE and three Modules from ENSA. Completion of the course assessments and course feedback earns a Certificate of Completion for instructors. [Enroll in Bridging course.](#)

### GENERAL INFORMATION ABOUT CCNA v7

| Topic    | Session                                      | Recording | Presentation |
|----------|--|-----------|--------------|
| Overview | New Technical Topics in CCNA v7              |           |              |
|          | Program Updates December 2019                |           |              |
|          | CCNA v7: UI, Assessments, and Other Features |           |              |

### TOPICS IN CCNA 1: Introduction to Networks v7.0 (ITN)

| Topic   | Session   | Recording | Presentation |
|---|---|-----------|--------------|
| Network Devices<br>These videos are included in ITNv7 Chapter 10. Posted here for your convenience. | Network Device Differences Part 1 Overview      |           | N/A          |
|   | Network Device Differences Part 2 Configuration |           | N/A          |

### TOPICS IN CCNA 2: Switching, Routing, and Wireless Essentials v7.0 (SRWE)

| Topic    | Session                  | Recording | Presentation |
|----------|--------------------------|-----------|--------------|
| Wireless | WLAN Fundamentals        |           |              |
|          | Wireless Security        |           |              |
| Security | LAN Security Concepts    |           |              |
|          | Switch Security Concepts |           |              |

### TOPICS IN CCNA 3: Enterprise Networking, Security, and Automation v7.0 (ENSA)

| Topic              | Session                          | Recording | Presentation |
|--------------------|----------------------------------|-----------|--------------|
| Security           | Network Security Concepts        |           |              |
|                    | VPN and IPSec Concepts           |           |              |
| Virtualization     | Network Virtualization           |           |              |
| Network Automation | Getting to know Cisco DNA Center |           |              |
|                    | Puppet, Chef and Ansible         |           |              |
|                    | REST API and JSON Encoded Data   |           |              |





# FY20 IPD Week Dates

23 - 27  
September  
2019

9 - 13  
December  
2019



17 - 21  
February  
2020

4 - 8  
May  
2020

<http://cs.co/IPD20>

# Do not miss important updates!

- Check you email settings

