

# Cloud and DevOps curriculums

At [Netacad.com](https://netacad.com) and [SkillsForAll.com](https://skillsforall.com)

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# Skills for All

with Cisco Networking  
Academy



# Creating a Hybrid Learning Environment

## Expanding Cisco Networking Academy with Skills for All

Free, flexible,  
mobile-friendly,  
self-paced learning  
experiences

**For All**



[SkillsForAll.com](https://SkillsForAll.com)



[NetAcad.com](https://NetAcad.com)

Instructor-Led experiences  
for  
in-class, blended or 100%  
distance learning

**For Academies**

More course delivery options for instructors to meet students where they are in their learning journeys.

# What is the Instructor-Guided Learner Experience?



Your opportunity to leverage the power of the innovative online learning experience on Skills for All.



Academy instructors can open free, mobile-friendly, online courses and monitor student progress.



Guide learners through engaging content, pre-built with gamification, interactive activities, videos, practice labs, and more.



Early access – be one of our first educators and help shape the experience.



# Networking Academy Instructors have options

The Instructor-guided Learner Experience on Skills for All expands course delivery options and tools for teaching. See if it might be right for you.

## NetAcad.com

Choose existing self-paced courses for:

- Localized self-paced courses
- Course customizations
- Class management
- Student messaging
- Live support agent
- Other student enrollment options



## SkillsForAll.com

Choose new instructor-guided courses for:

- Easy course creation
- Easier learner onboarding
- Single Sign On
- Use self-enrollment links to register students
- Gamification
- Mobile-first
- Monitor student progress



# How Skills for All helps Academies



## Create a pipeline

Use Skills for All courses to create a pipeline to additional certification-aligned courses that instructors are already teaching



## Reach more students

By attracting learners earlier in their learning journey



## Stay relevant

By offering innovative curriculum and certification-aligned courses that prepare students to succeed in the changing landscape of IT



## Save instructors' time

Without skimping on quality by leveraging engaging, ready-made online content – featuring videos, gamification, practice labs, and more - plus, metrics for academies.

# Networking Academy Curriculum Portfolio

04.26.2022

## Explore

Introduction to exciting opportunities in technology.

- ▲ Get Connected
- ▲ NDG Linux Unhatched
- ▲ Introduction to Cybersecurity
- ▲ Introduction to IoT and Digital Transformation
- ▲ Getting Started with Cisco Packet Tracer
- ▲ Exploring Networking with Cisco Packet Tracer
- ▲ Exploring IoT with Cisco Packet Tracer

## Career

Preparation for entry level positions.

- Digital Essentials**
  - ★ ● IT Essentials
  - ▲ NDG Linux Essentials
  - ▲ Networking Essentials
- ▲ Cybersecurity Essentials
- ▲ PCAP: Programming Essentials in Python

**Networking**

CCNA:

- ★ ● ■ Introduction to Networks
- ★ ● ■ Switching, Routing, & Wireless Essentials
- ★ ● ■ Enterprise Networking, Security & Automation

CCNP Enterprise:

- ★ ● ■ Core Networking (ENCOR)
- ★ ● ■ Advanced Routing (ENARSI)

**Programmable Infrastructure**

- ▲ Python Essentials 1
- ★ ● ■ DevNet Associate
- Workshop: Experimenting with REST APIs
- Workshop: Model-Driven Programmability

**Cybersecurity**

- ▲ Endpoint Security
- ▲ Network Defense
- ▲ Cyber Threat Management
- ▲ Cybersecurity Pathway
- ★ ● ■ CyberOps Associate
- ★ ■ Network Security
- ▲ Cloud Security

## Practice

Develop skills with interactive tools & experiences

- Cisco Packet Tracer
- Gaming
- Virtual Labs
- Assessments
- Physical Equipment

## Complementary Offerings

Additional offerings available from Partners.

**NDG**

- ▲ NDG Linux I
- ▲ NDG Linux II
- ▲ NDG NETLAB+
- ▲ NDG CyberOps Lab



- ▲ JavaScript Essentials 1 (JSE)
- CLA: Programming Essentials in C
- CLP: Advanced Programming in C
- CPA: Programming Essentials in C++
- CPP: Advanced Programming in C++

○ Aligns to Certification/Certificate    □ Instructor Training Required    ▲ Self-paced    ☆ ASC Alignment Required

Includes courses on NetAcad.com and SkillsForAll.com

# Introduction to IoT and Digital Transformation

## Course Overview

The course provides learners with an engaging, exploratory view of the Internet of Things and highlights how Digital Transformation impacts organizations, businesses, governments, industries, and our daily lives.

## Benefits

Learners discover how IoT, along with emerging technologies such as data analytics, artificial intelligence and cybersecurity, are digitally transforming industries and expanding career opportunities. Learners understand the importance of Intent-Based Networking using a software-driven approach and machine learning to be able to connect and secure tens of billions of new devices with ease.

## Explores Opportunities in Technology

- ✓ Develops digital basics
- ✓ Explores career opportunities in the new emerging technologies landscape

[View Course](#)

## Course Details

**Target Audience:** Secondary and 2-Year college students, general audience

**Estimated Time to Completion:** 6 hours

**Prerequisites:** None

**Course Delivery:** Instructor-guided or Self-paced

### Learning Component Highlights:

- ✓ 6 modules
- ✓ 16 practice lab activities
- ✓ 7 Cisco Packet Tracer activities
- ✓ 12 videos
- ✓ Knowledge checks and module quizzes
- ✓ Final exam

**Course Recognitions:** Digital Badge

**Recommended Insertion Points:** A great start for any learning path, and a way to introduce digital transformation before or during any Career course.



## Requirements

- ASC Alignment Required: No
- Instructor Training Required: No
- Physical Equipment Required: No



# Skills for All

## Quick Demo



# DevNet Associate Course



# Response to Digital Disruption

Changing What We Teach

## The IT Team of the Future

World of  
Network  
Engineers



World of  
Security  
Professionals



World of  
Software  
Developers

# DevNet Associate Certification



## Knowledge Domains

- Understanding and Securely Using APIs
- Software Development and Design
- Application Deployment and Security
- Infrastructure and Automation
- Network Fundamentals

# DevNet Associate 1.0

## Course Overview

This course introduces the methodologies and tools of modern software development, applied to the IT and Network operations. It covers a 360 view of the domain including microservices, testing, containers and DevOps, as well as securely automating infrastructures with Application Programming Interfaces (APIs).

## Benefits

Gain practical, relevant, hands-on lab experience, including programming in Python, using GIT and common data formats (JSON, XML and YAML), deploying applications as containers, using Continuous Integration/Continuous Deployment (CI/CD) pipelines and automating infrastructure using code.

## Prepare for Careers

- ✓ Develop skills for entry-level software development and infrastructure automation jobs
- ✓ Prepare for DevNet Associate certification exam

## Course Details

**Target Audience:** Secondary vocational students, 2-year and 4-year college students and participants of coding bootcamps

**Estimated Time to Completion:** 70 hours

### Recommended Preparation:

Coding skills, equivalent to:

PCAP: Programming Essentials in Python

Fundamental skills of networking, equivalent to:

CCNA: Introduction to Networks

**Course Delivery:** Instructor-led

### Learning Component Highlights:

- ✓ 8 Modules with 6 Videos, 23 Hands-on Labs and 5 Cisco Packet Tracer Activities
- ✓ 8 Quizzes, 8 Module Exam, Practice Final Exam, Final Exam, Skills Based Assessment
- ✓ Practice Exam for DEVASC Certification

**Course Recognitions:** Certificate of Completion, Letter of Merit, Digital Badge, Cert Voucher

### Recommended Next Course:

CCNA, CCNP or CyberOps Associate

## Infrastructure Automation



## Requirements & Resources

- **ASC Alignment Required:** Yes
- **Instructor Training Required:** Yes
- **Physical Equipment Required:** No, only using Virtual Machines on the student's computer
- **Voucher Availability:** Yes





# Course Outline

	Module Title	Objectives
1	Course Introduction	<ul style="list-style-type: none"><li>• Setup the lab environment</li><li>• Review Python programming and Linux skills</li></ul>
2	The DevNet Developer Environment	<ul style="list-style-type: none"><li>• Explore and get familiar with DevNet Resources</li></ul>
3	Software Development and Design	<ul style="list-style-type: none"><li>• Use best practices from software development and design with Python</li></ul>
4	Understanding and Using APIs	<ul style="list-style-type: none"><li>• Discover API Design and Architecture styles and Advanced uses of REST APIs</li><li>• Interact with REST APIs using command line, graphical tools and Python code</li></ul>
5	Network Fundamentals	<ul style="list-style-type: none"><li>• Explain the features and functions of common network devices</li><li>• Troubleshoot basic network connectivity issues</li></ul>
6	Application Deployment and Security	<ul style="list-style-type: none"><li>• Use current technologies to deploy and secure applications and data in a local or cloud environments</li></ul>
7	Infrastructure and Automation	<ul style="list-style-type: none"><li>• Explore software testing and deployment methods in automation and simulation environments and use DevOps tools for infrastructure automation</li></ul>
8	Cisco Platforms and Development	<ul style="list-style-type: none"><li>• Compare Cisco platforms used for collaboration, infrastructure management, and automation</li><li>• Use APIs to interact with and automate Cisco platforms</li></ul>



# Lab Equipment

## 2 Virtual Machines

- DEVASC Lab VM
- Cisco CSR1000v VM

```
ETW-CSR1000v 16.09.05 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

Press RETURN to get started.

***
*** Cisco Networking Academy ***
*** This software is provided for ***
*** Educational Purposes ***
*** Only in Networking Academies ***
***
***

CSR1k0>sh ip int brief
Interface IP-Address OK? Method Status Protocol
GigabitEthernet1 192.168.56.102 YES DHCP up

CSR1k0>sh ver
Cisco IOS XE Software, Version 16.09.05
Cisco IOS Software [Fuji] Virtual XE Software (X86_64_LINUX_IOSD-UNIVERSALK9-M), Version 16.9.5, RELEASE SOFTWARE (fc1)
```

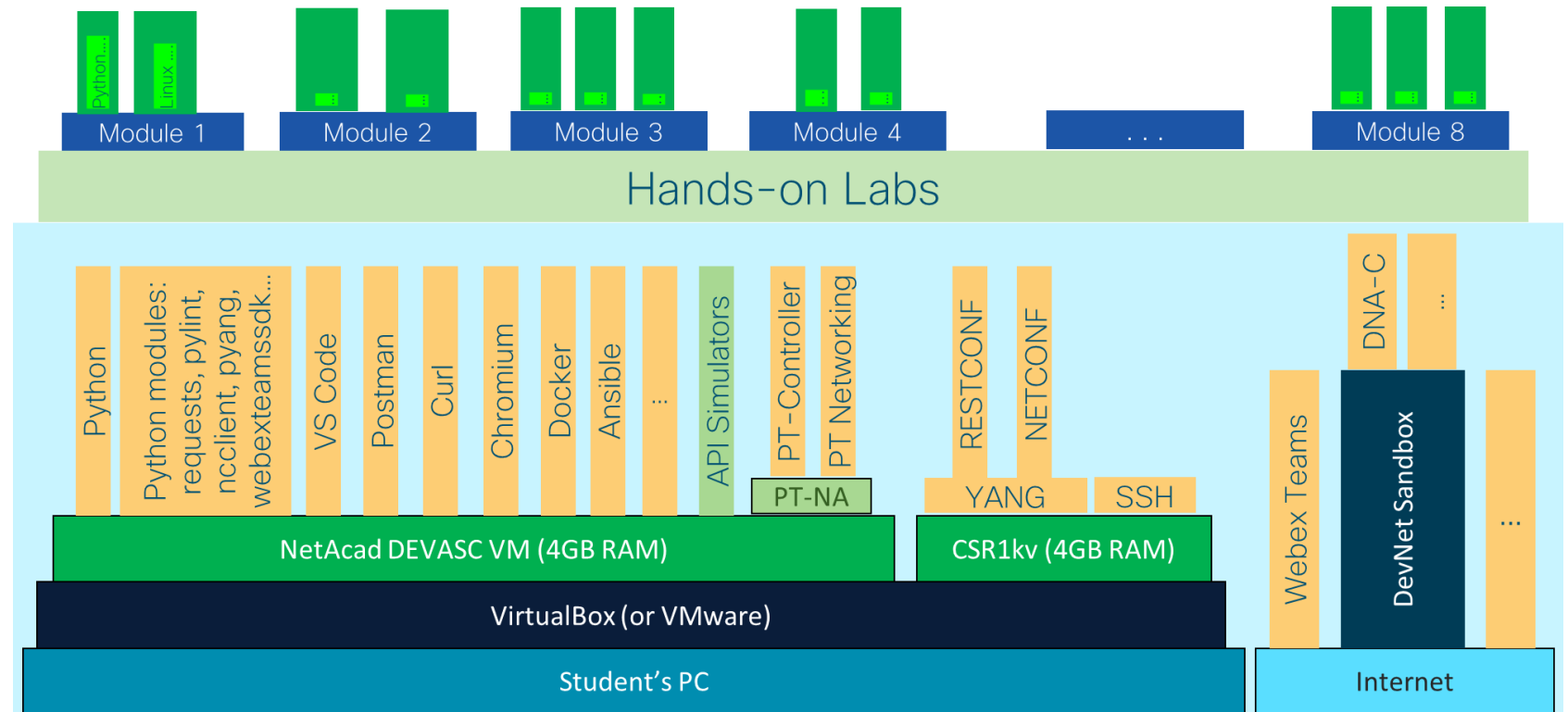
The collage illustrates a DevOps workflow. It shows a REST client interface for testing API endpoints, a network diagram, a REST API documentation page for 'addTicket', a Python script for interacting with the API, a REST client showing a successful API call, and a web application interface for a 'School Library' with a list of books.



# Lab Equipment

## 2 Virtual Machines

- **DEVASC Lab VM:**
  - All software tools bundled in a single Virtual Machine
  - No need to install, setup, or configure any tools
  - All students have the same consistent experience
  - Built-in REST API Simulator
  - Includes Packet Tracer for Network Automation
- Cisco CSR1000v VM







# Lab Equipment

## 2 Virtual Machines

- **DEVASC Lab VM:**
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- Cisco CSR1000v VM

The screenshot displays a virtual machine environment with several windows:

- Python Script (getTicket.py):** Shows a REST API client script using the requests library. The controller URLs and authentication data are highlighted in a red box.

```
1 import requests
2 import json
3
4 # Controller1 = http://127.0.0.1:5001
5 # Controller2 = http://127.0.0.1:5002
6 URLOfController1 = "http://127.0.0.1:5001/api/v1/ticket"
7 URLOfController2 = "http://127.0.0.1:5002/api/v1/ticket"
8
9 authData = {
10     "username": "cisco",
11     "password": "cisco"
12 }
13 headers = {
14     "content-type": "application/json"
15 }
16 for URL in [URLOfController1, URLOfController2]:
17     r = requests.post(URL,
18                     headers=headers,
19                     data=json.dumps(authData),
20                     verify = False
21 )
22     if r.status_code == 200:
23         print(
24             r.json()['response']['serviceTicket']
25         )
26
27
28
29
30
31
32
```

- Network Diagram:** A Packet Tracer network diagram showing a topology with a Network Controller (PT-Controller1), two routers (ISR4331), two switches (2960-24T), and four PCs (PC0-PC4).
- Web Browser:** Shows the URL `http://10.0.0.254` and the Cisco Network Controller interface.
- Terminal Window:** Shows the execution of the Python script, outputting the service ticket information.

Host Device		Connected Network Device				
MAC	IP	Hostname	Type	IP	Hostname	Port
0060.2F33.D7B3	10.0.1.129	PC2	Pc	10.0.1.2	SW-LAN	FastEthernet0/3
00D0.FF66.A201	10.0.1.131	PC1	Pc	10.0.1.2	SW-LAN	FastEthernet0/2
0090.0C76.101A	10.0.1.132	PC3	Pc	10.0.1.2	SW-LAN	FastEthernet0/4
0001.972C.906B	10.0.1.130	PC0	Pc	10.0.1.2	SW-LAN	FastEthernet0/1
0001.6333.9280	10.0.0.4	PC5	Pc	10.0.0.3	SW-Left3650	GigabitEthernet1/0/1
0090.21B2.6DC4	10.0.1.128	PC4	Pc	10.0.1.2	SW-LAN	FastEthernet0/5

# Emerging Technology Workshops



# 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).



### 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: ITN

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

# Emerging Technologies Workshop

## Model-Driven Programmability

### Workshop Overview

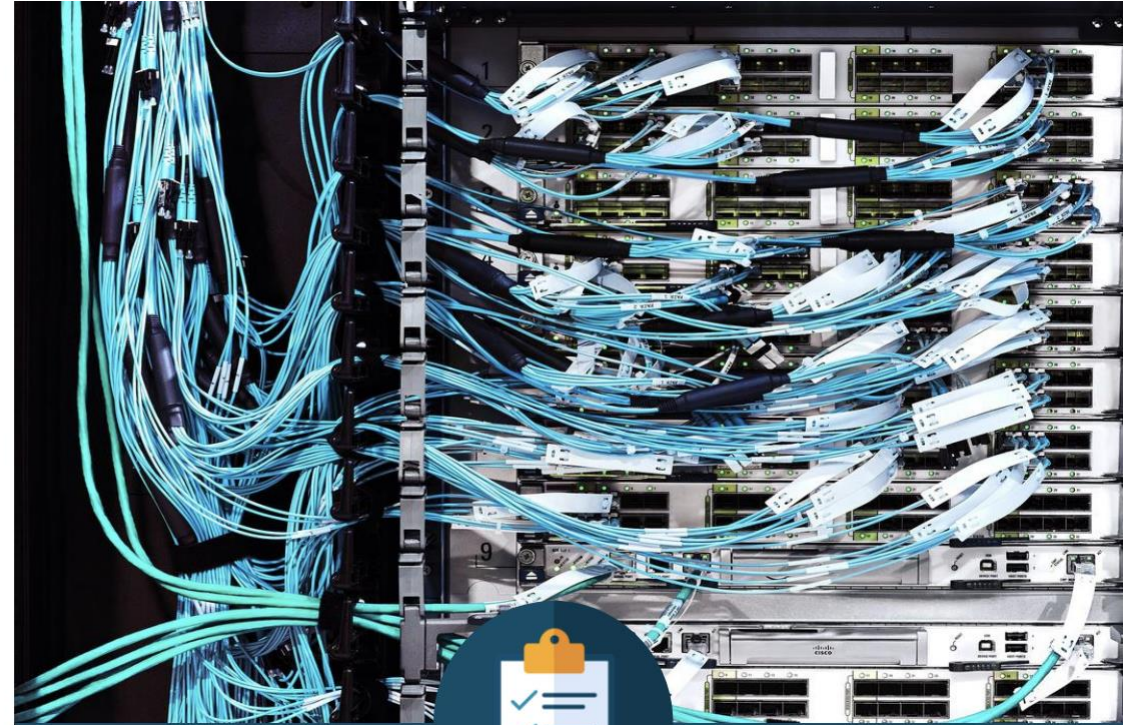
With the increasing size of the modern network and the frequency of changes required by the business, managing and automating networks via a Command Line Interface (CLI) is ineffective and error prone. A new approach, using Model Driven Programmability, enables transactional changes, by defining standardized 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 NETCONF 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: SRWE 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: SRWE, with CCNA Security or CCNP ENCOR

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

# Cloud Security Course



# NetAcad Cloud Security Course

This course gives a broad overview of cloud security and allows students to gain critical insights into issues such as data security, key management, and identity and access management.

## Target Audience

- Learners enrolled in technology degree programs at higher education institutions
- Learners who want to reskill for a career in Cloud Security

## Instructor Mentored

- Learners sign up through “Find an Academy”
- Exclusively for the NetAcad community
- At NO cost to our academies. (~~500 USD per learner~~)

## Prerequisites: None

Recommended preparation

- Introduction to Cybersecurity
- Cybersecurity Essentials

# NetAcad Cloud Security Course

## 35 Hours

Pursue a career in cloud security, an in-demand, exciting new area that spans all industries

## Online Self Paced

- No Physical Equipment
- Certificate of Attendance

## No instructor training

- No ASC Alignment Required
- CCSK Exam Discount Available for Networking Academy learners

## Aligned to CCSK

Prepares students to take the Certificate of Cloud Security Knowledge (CCSK) exam



# Course Objectives

- Spark interest in cloud security
- Familiarize with the universal concepts of cloud computing
- Provide a base of knowledge on cloud computing security theory
- Acquaint with security threats and best practices for securing the cloud
- Assist in taking the CCSK exam.



# Course Structure

- ✓ 6 modules
- ✓ 20+ videos
- ✓ 10 interactive activities
- ✓ 37 quizzes
- ✓ 1 Practice exam



# Online Learning Environment

Home / I'm Teaching / Cloud Security 1.00 EN

Course Home

Grades / Completion

View as student

Messages

Calendar

## Cloud Security 1.00 EN

### Welcome to Cloud Security 1.0

The Cloud Security course (Certificate of Cloud Security Knowledge training developed by Cloud Security Alliance) gives a broad overview of cloud security and allows students to gain critical insights into issues such as data security, key management, and identity and access management. This course provides a self-paced learning experience through lectures and frequent knowledge checks. There are no prerequisites for this 6 module course.

As organizations migrate to the cloud, they need information security professionals who are cloud savvy. The Certificate of Cloud Security Knowledge (CCSK) is widely recognized as the standard of expertise for cloud security, and gives you a cohesive and vendor-neutral understanding of how to secure data in the cloud. The CCSK credential is the foundation to prepare you to earn additional cloud credentials.

What are the benefits of earning your CCSK?

- **Prove** your competency in key cloud security issues through an organization that specializes in cloud research.
- **Increase** employment opportunities by filling the skills-gap for cloud-certified professionals.
- **Demonstrate** your technical knowledge, skills, and abilities to effectively use controls tailored to the cloud.
- **Learn** to establish a baseline of security best practices when dealing with a broad array of responsibilities, from cloud governance to configuring technical security controls.
- **Complement** other credentials such as the Cisco Certified CyberOps Associate, CCAK, CISA, CISSP and CCSP.

**Have a question about the CCSK?**  
Feel free to reach out to us at: [support@cloudsecurityalliance.org](mailto:support@cloudsecurityalliance.org)

**CCSK**<sup>™</sup>  
Certificate of  
Cloud Security Knowledge

**CSA** cloud security alliance<sup>®</sup>

# Knowledge Checks

MENU

CCSK Module 1 Unit 3 - Cloud Essential Characteristics

FAQ RESOURCES GLOSSARY

Welcome

Unit Structure

NIST Model of Cloud Computing

Essential Characteristics of Cloud

Resource Pooling & Multitenancy

Conclusion

Knowledge Check

Click and drag the correct NIST model element to the appropriate category below.

Private

Broad Network Access

Essential Characteristics

Service Models

Deployment Models

PaaS (Platform as a Service)

SUBMIT

MENU

Welcome

Unit Structure

The Amazon EC2 Story

Resource pools

"Static" Virtualization vs. Cloud Computing

Definitions

What is Cloud Computing?

Potential Benefits of Cloud Computing

Conclusion

Knowledge Check

CCSK Module 1 Unit 2 - Introduction & Cloud Architecture

FAQ RESOURCES GLOSSARY

TEST YOUR KNOWLEDGE

What is the key difference between traditional virtualization and cloud?

Commercial virtualization software

Orchestration

Hypervisors

Abstraction

SUBMIT

# Topics Covered



## Cloud Computing Fundamentals

The fundamentals of cloud computing, cloud architectures, service, delivery, and deployment models and the role of virtualization.



## Data Security for Cloud Computing

The Data Security Lifecycle, data security issues with different delivery models, and managing encryption in the cloud.



## Infrastructure Security for Cloud Computing

Securing the core infrastructure for cloud computing, networks, management interfaces and administrator credentials.



## Application Security and Identity Management for Cloud Computing

Federated identity, different IAM applications, secure development, and managing application security in and for the cloud.



## Managing Cloud Security and Risk

Risk assessment, governance, and key legal and compliance issues in the cloud such as discovery requirements.

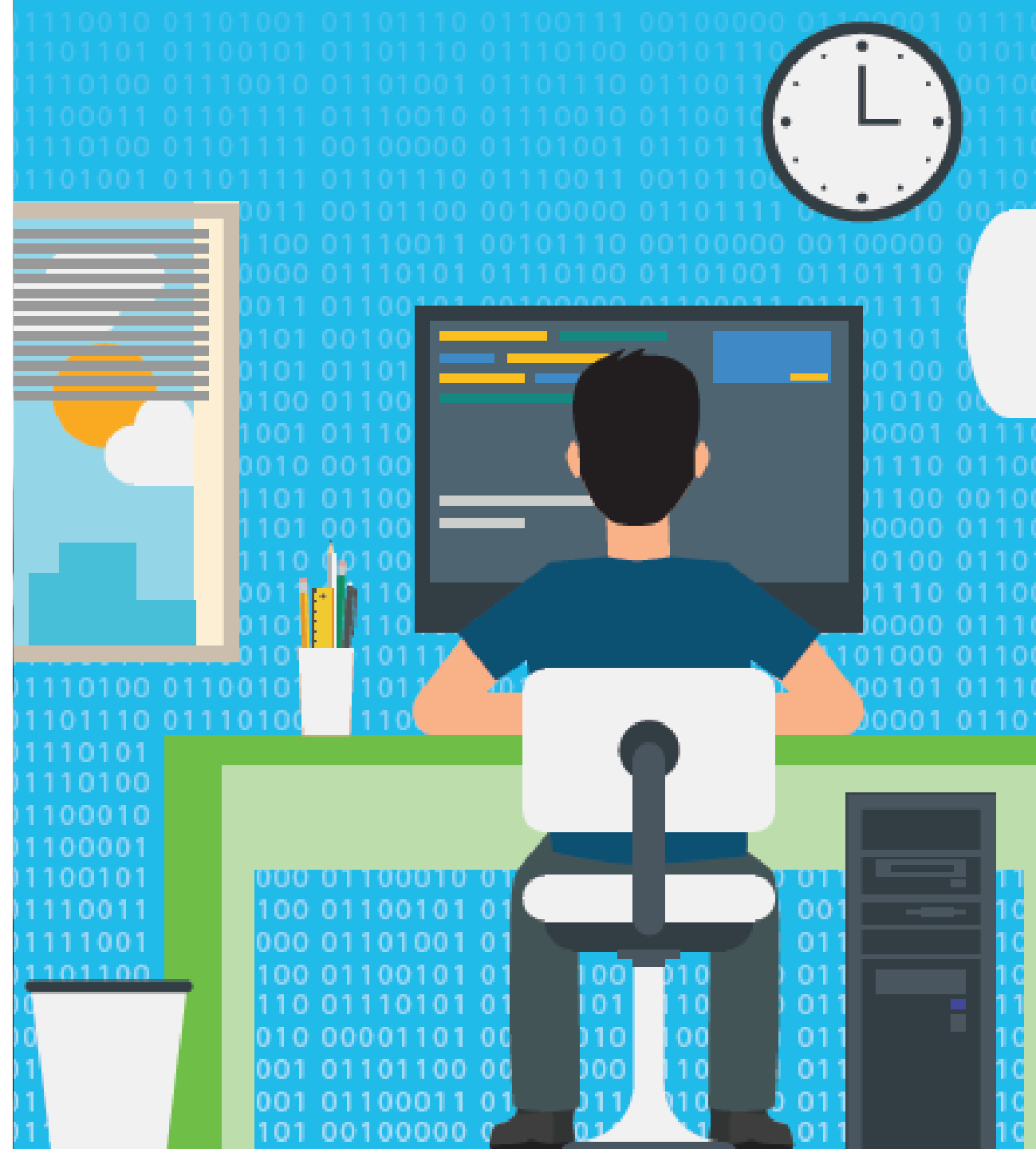


## Cloud Security Operations

Key considerations for evaluating, selecting, and managing cloud computing providers, Security as a Service, and incident response.

# IPD Week – 1000 Ways to use Packet Tracer

- 1 What is Cisco Packet Tracer
- 2 **Case 1: Network Simulation**
- 3 **Case 2: Physical Layer**
- 4 **Case 3: My own custom lab**
- 5 **Case 4: Games and competitions**
- 6 **Case 5: IoT World**
- 7 **Case 6: Network automation**
- 8 **Case 7: Tutored activities**



# More IPD Week – past sessions

- 17 sessions on DevNet Associate and API
- Network telemetry
- Network programmability
- Network infrastructure as a code
- SDN Clustering
- Streaming telemetry for network infrastructure
- Many other sessions in IPD Week Archive



## Did you miss an IPD session?

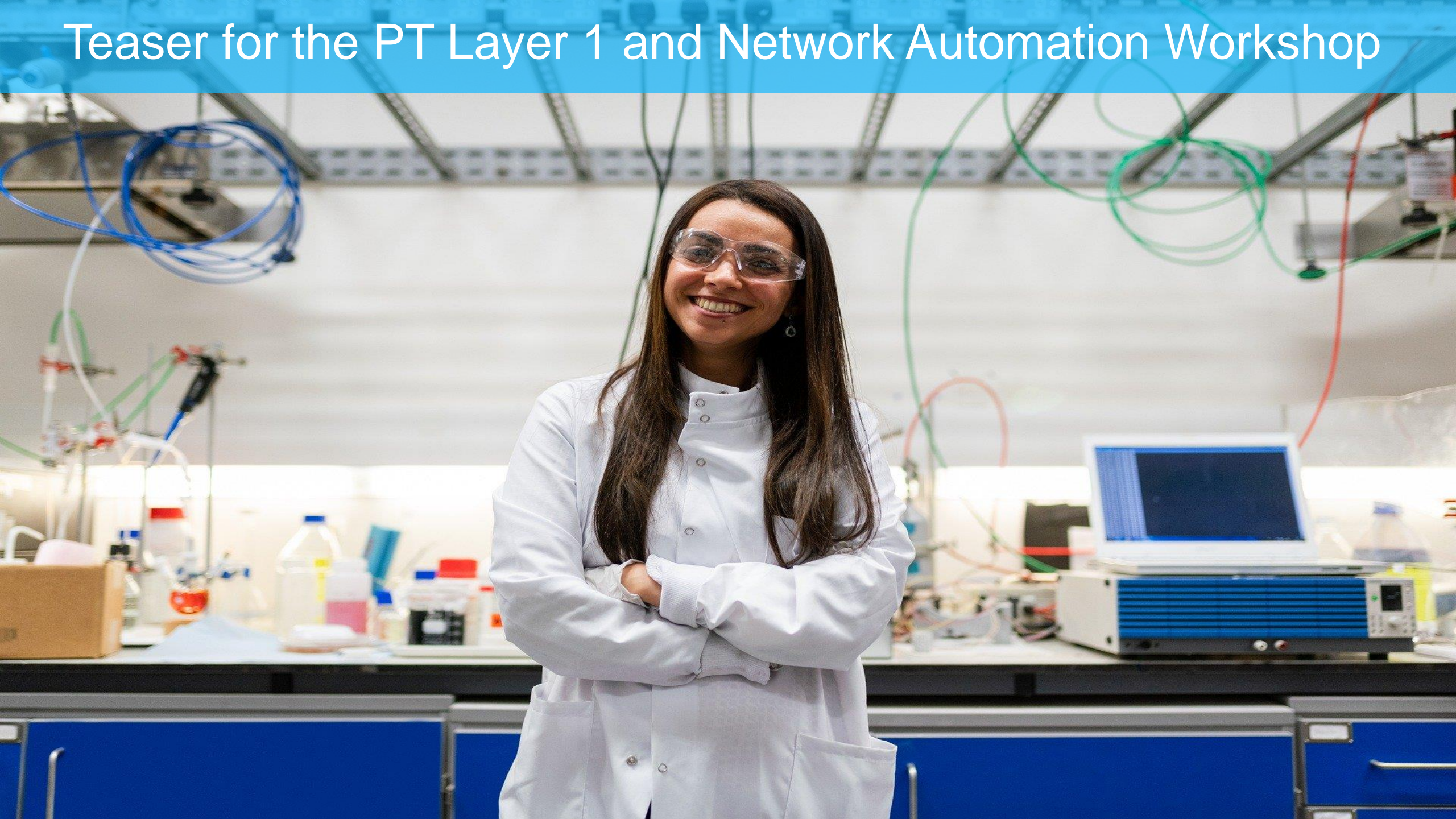
We have many great sessions in the IPD Week Archive available in multiple languages:

[English](#) [Spanish](#) [All other languages](#)



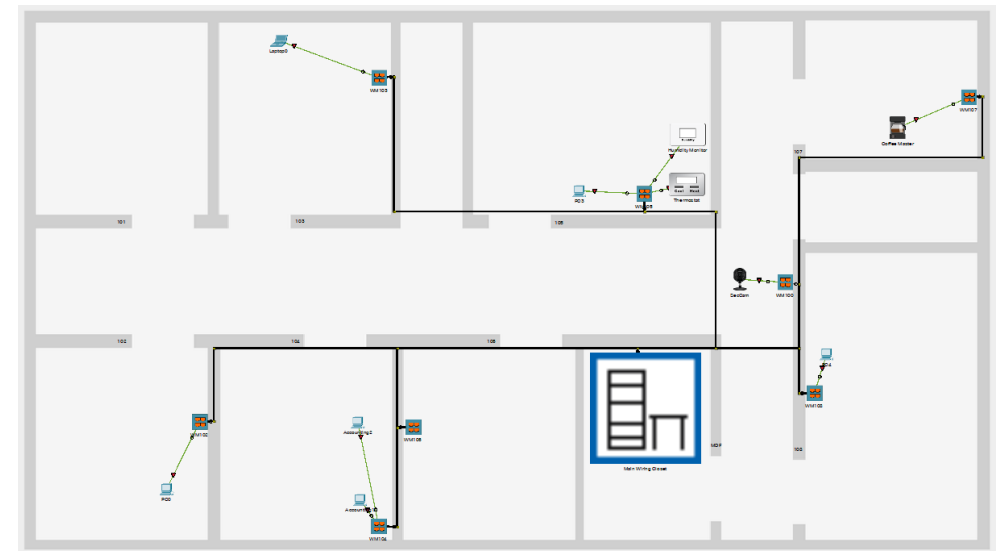
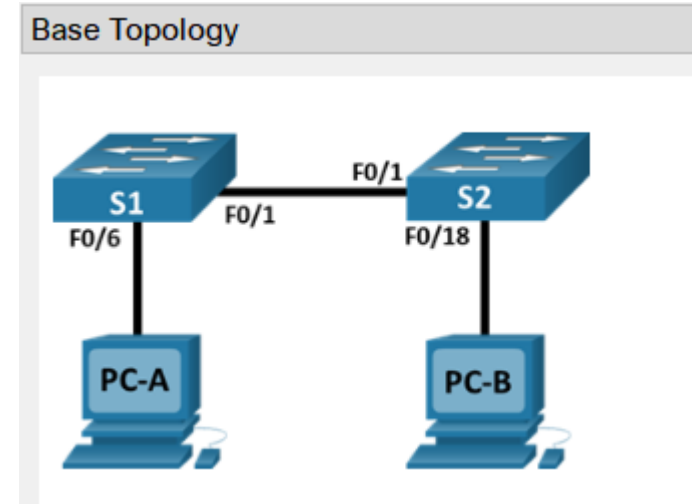
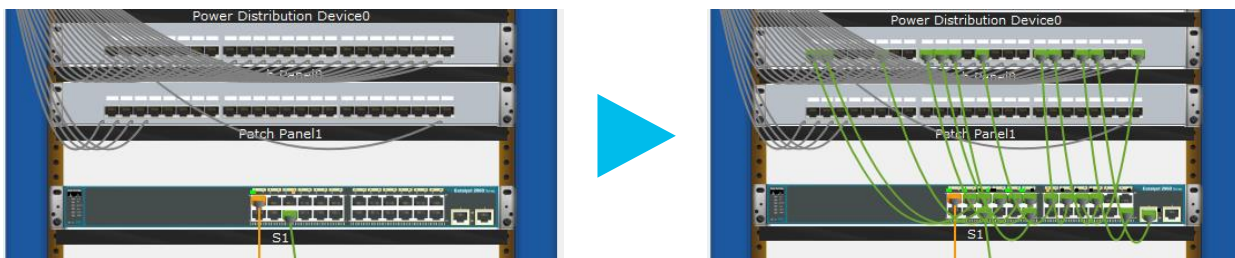
<https://www.netacad.com/portal/resources/professional-development/ipd-week>

# Teaser for the PT Layer 1 and Network Automation Workshop



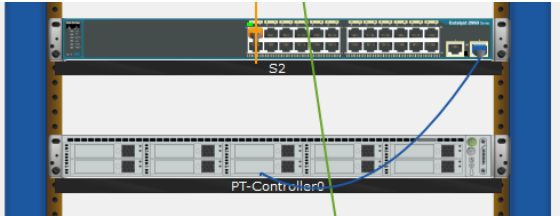
# PT8 Physical Cabling Workshop

- Based on a simple rack and stack PTPM activity, first step is to build a simple two-switch network
- Extended with office structured cabling and hosts scattered around the office
- Hosts are patched to wall mounts, but patch panel cabling is missing
- Cabling to be complete based on provided Structured Cabling and Patch Cabling sheets





# Progress Tracking



eugenebot 9:15

Host count for **Turbo** is now **3**. That's a good start!

Host count for **Turbo** is now **4**

Host count for **Turbo** is now **5**

Host count for **Turbo** is now **6**. Way to go!

Host count for **Turbo** is now **7**

Host count for **Turbo** is now **8**

Host count for **Turbo** is now **9**

Host count for **Turbo** is now **10**. Almost done!

Host count for **Turbo** is now **11**

Host count for **Turbo** is now **12**. Activity complete,

**Congratulations, Turbo!!**

```
71 def main():
72
73     hostCount = 0
74
75     while True:
76         lo = workspace.getLogicalObject()
77         name = lo.getName()
78
79         newHostCount = getHostCount()
80
81         print ("%s - %d"%(name,newHostCount))
82
83         if newHostCount != hostCount:
84
```

- There is a Network Controller connected to the network and set up to monitor hosts reachability
- One of the PCs continuously polls the Controller via the API
- A message is sent to Webex space when the number of reachable hosts increases



Networking  
Academy