ıı ıı ı ı Networking
CISCO Academy

Programmable Infrastructure
With Cisco DevNet Associate

ICT Educators Webinar for the California Community Colleges

Jozef Janitor (jjanitor@cisco.com), Emerging Technologies Product Manager
Sara Shreve (sashreve@cisco.com), CSR Program Manager
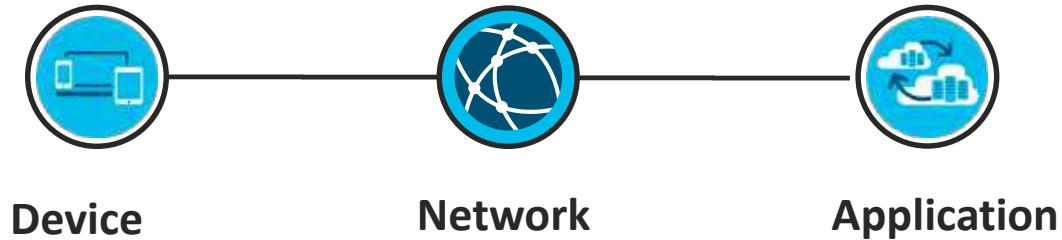Cisco Networking Academy
November 20, 2020

Agenda

- Software is Eating the World

- The DevNet Associate Course

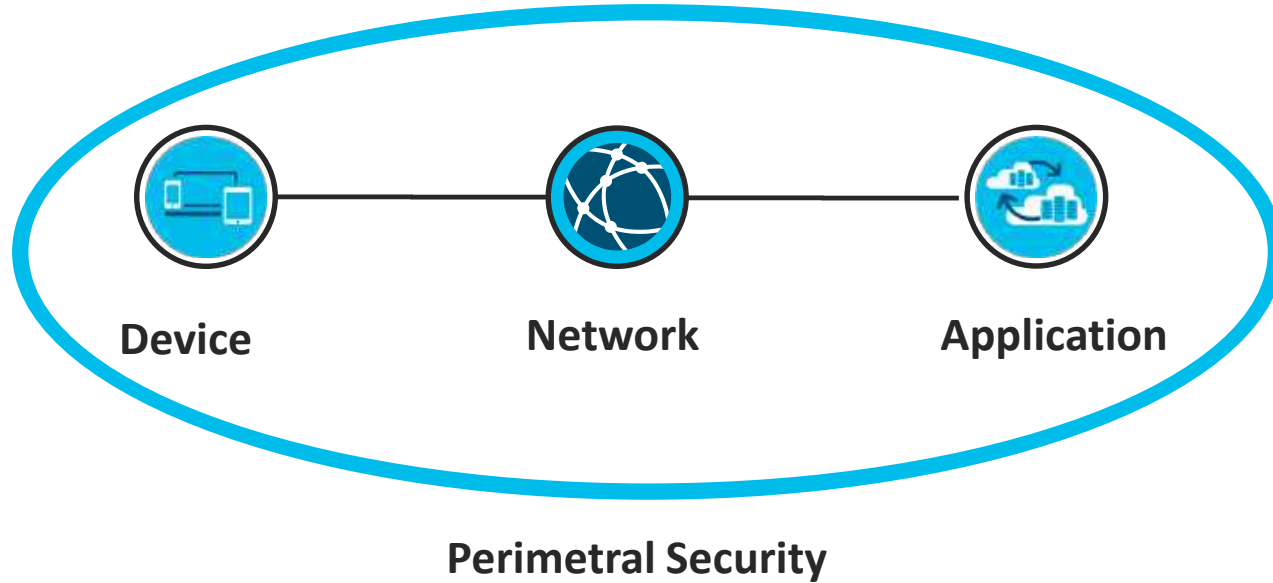- Course & Labs Demo

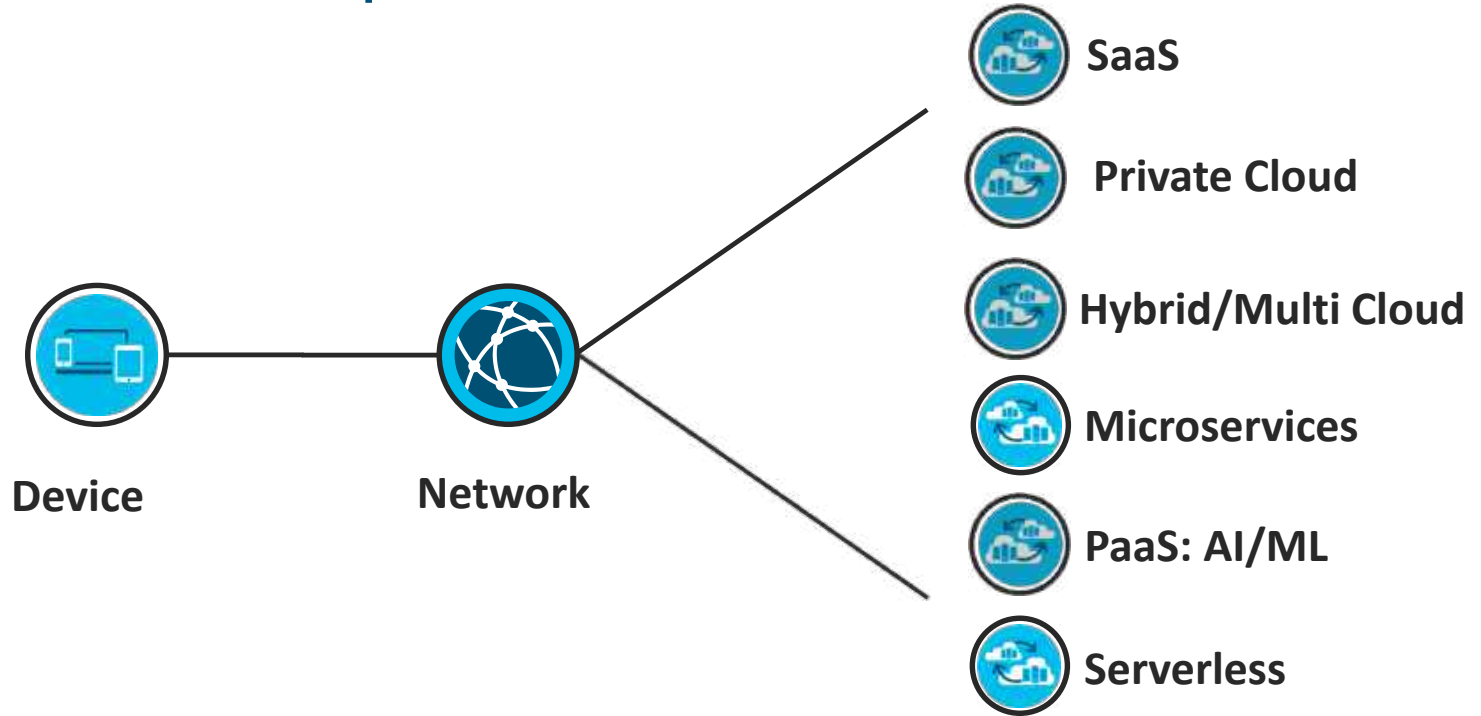- Additional Resources

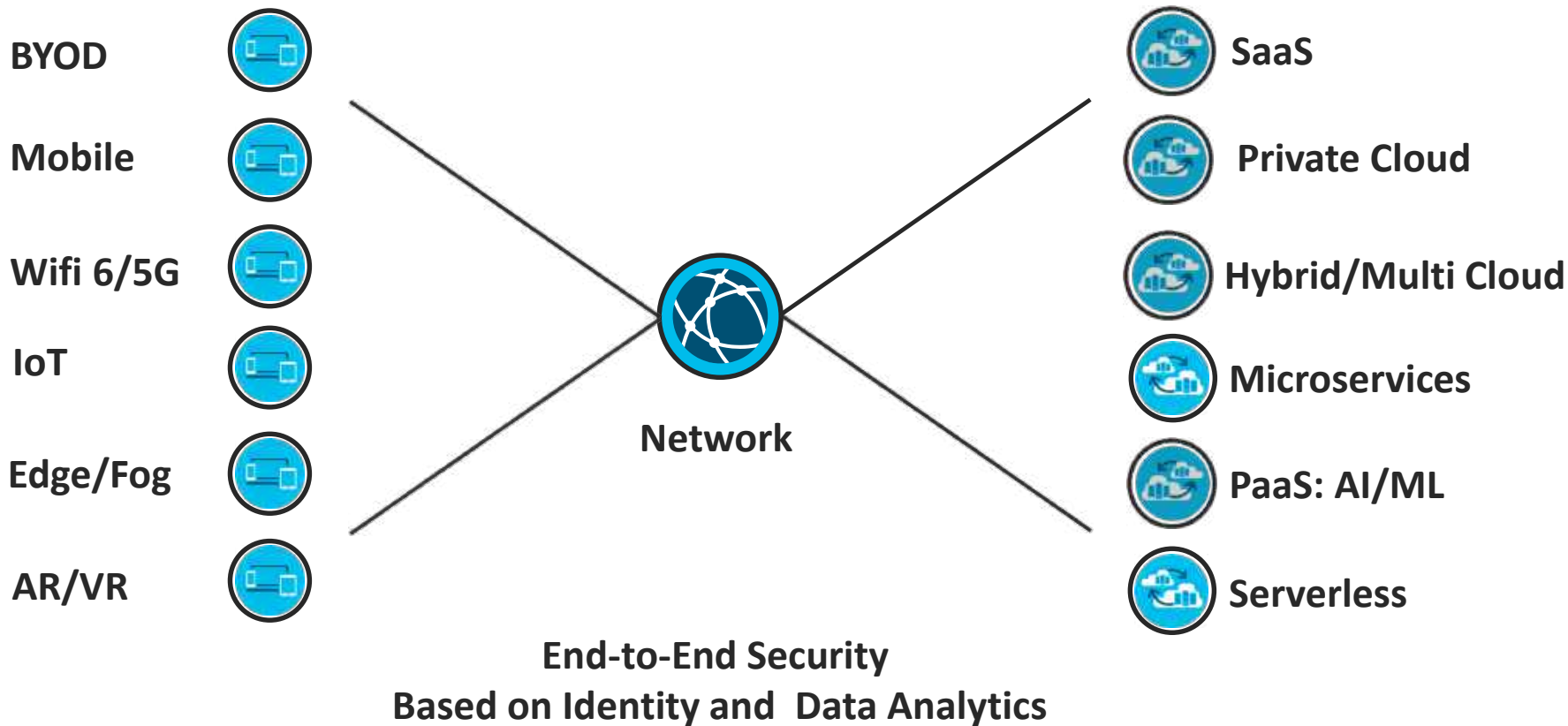Software is eating the world

Traditional ICT Infrastructure

Device　　　　　**Network**　　　　　**Application**

Traditional ICT Infrastructure

Device   **Network**   **Application**

Perimetral Security

Cloud revolution impact

Device   Network

- SaaS
- Private Cloud
- Hybrid/Multi Cloud
- Microservices
- PaaS: AI/ML
- Serverless

Mobile, IoT & VR impact

BYOD

Mobile

Wifi 6/5G

IoT

Edge/Fog

AR/VR

Network

SaaS

Private Cloud

Hybrid/Multi Cloud

Microservices

PaaS: AI/ML

Serverless

End-to-End Security
Based on Identity and Data Analytics

The Network Faces its Biggest Transformation

Connectivity-driven network
(1983-2020)

Reactive
Device Management
Centralized Compute
Fixed Wired Access
Perimeter Security

Proactive
Policy-based Automation
Multicloud
Wireless 5G + WiFi6
Zero Trust

Business outcomes enabler
(2020+)

Predictive
Intent-based
Cloud / Edge
Ubiquitous Roaming
Self-Defending

Response to Digital Disruption

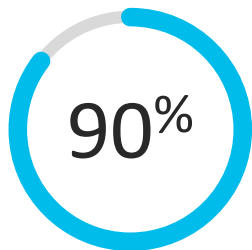Changing What We Teach

The IT Team of the Future

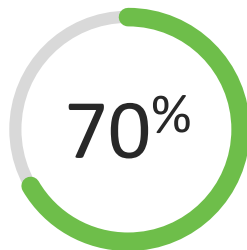World of Network Engineers **+** World of Security Professionals **+** World of Software Developers
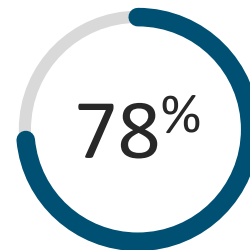
Certifications drive key skills for innovation and scale

90%

Of CEOs say their company is facing disruptive change driven by digital technologies

70%

Of CEOs say their company doesn't have the skills to adapt

78%

Of technology execs/managers believe technical certifications are a critical success factor

Cisco Certification Evolution

	Associate Level	Professional Level	Expert Level
Network Engineers	CISCO CERTIFIED CCNA	CISCO CERTIFIED CCNP	CISCO CERTIFIED CCIE
Software Developers	CISCO CERTIFIED DEVNET Associate	CISCO CERTIFIED DEVNET Professional	Cisco Certified DEVNET Expert Under Consideration
Cybersecurity Professionals	CISCO CERTIFIED CyberOps Associate	Cisco Certified CyberOps Professional Under Consideration	Cisco Certified CyberOps Expert Under Consideration

DevNet Associate Certification

CISCO
CERTIFIED

DEVNET

Associate

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

DevNet Associate

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

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

Certification Aligned
Cisco Certified DevNet Associate

Digital Badge & Certification Discount Voucher

netacad.com/portal/teaching

Cisco Networking Academy

My NetAcad ▾   Resources ▾   Courses ▾   Careers ▾   About Us

Jozef ▾

I'm Teaching

Courses I'm Teaching (Favorite courses are listed first)

Student Lookup   Create Course

Academy/Institution

ALL ACADEMIES

Search by Course name or ID

demo

Status

All Statuses

View

⭐   ■ In Progress

DevNet Associate course demo
DevNet Associate course demo
DevNet Associate

18 Nov 2020 - 30 Sep 2021
Cisco Staff
DevNet Associate course demo

👤 Course Details   👤≡ Grades   📊 Assignments

Share Idea

Showing   100 ▾   ‹‹ ‹   1 - 1 of 1   › ››

lms.netacad.com/course/view.php?id=149351

Networking Academy
CISCO

My NetAcad ⌄   Resources ⌄   Courses ⌄   Careers ⌄   About Us

Jozef ⌄

Home / I'm Teaching / DevNet Associate course demo

DevNet Associate course demo

⚙ ⌄

Welcome to DevNet Associate 1.0 (DEVASC)   ⌃

☑

Use the course navigation links to access all of the content, assessments, practice activities and resources for this course.

Module 1   ⌃

🧩 Module 1: Course Introduction Content   ☑

Restricted Available until end of **29 September 2021**

🧩 Module 1: Course Introduction Exam

Sidebar Navigation
- 🏠 Course Home
- 🗗 Grades
- 📊 Assessment Center
- 👤 View as student
- 💬 Messages
- 📅 Calendar

Activities
- 💧 Assignments
- 🔌 External tools
- 📄 Resources

Find answers to many of your Networking Academy questions:

NetAcad Virtual Assistant

Upcoming events

There are no upcoming events

Go to calendar...

Share Idea

Module 1

Module 1: Course Introduction Content
Restricted Available until end of **29 September 2021**

Module 1: Course Introduction Exam
Restricted Available until end of **29 September 2021**

Module 2

Module 2: The DevNet Developer Environment Content
Restricted Available until end of **29 September 2021**

Module 2: The DevNet Developer Environment Exam
Restricted Available until end of **29 September 2021**

Module 3

Module 3: Software Development and Design Content
Restricted Available until end of **29 September 2021**

Module 3: Software Development and Design Exam
Restricted Available until end of **29 September 2021**

Module 4

Module 4: Understanding and Using APIs Content
Restricted Available until end of **29 September 2021**

Module 4: Understanding and Using APIs Exam
Restricted Available until end of **29 September 2021**

Module 5

Module 5: Network Fundamentals Content

Module 8: Cisco Platforms and Development Content

Restricted Available until end of **29 September 2021**

Module 8: Cisco Platforms and Development Exam

Restricted Available until end of **29 September 2021**

Skills Exam

DEVASC Final Skills Assessment

Practice Exams

Practice Final Exam

Restricted Available until end of **29 September 2021**

Course Feedback

End of Course Feedback

Restricted Available until end of **29 September 2021**

Final Exam

Restricted Not available unless: The activity End of Course Feedback is marked complete

Final Exam

Restricted Available until end of **29 September 2021**

Certification Practice Exam

Certification Practice Exam

Restricted Available until end of **29 September 2021**

Welcome to DevNet Associate 1.0 (DEVASC)

Use the course navigation links to access all of the content, assessments, practice activities and resources for this course.

Module 1

Module 1: Course Introduction Content
Restricted Available until end of **29 September 2021**

Module 1: Course Introduction Exam
Restricted Available until end of **29 September 2021**

Module 2

Module 2: The DevNet Developer Environment Content
Restricted Available until end of **29 September 2021**

Module 2: The DevNet Developer Environment Exam
Restricted Available until end of **29 September 2021**

External tools
Resources

Find answers to many of your Networking Academy questions:

NetAcad Virtual Assistant

Upcoming events

There are no upcoming events

Go to calendar...

Assessment Center

View as student

Messages

Calendar

Share idea

https://lms.netacad.com/mod/lti/view.php?id=4850375

≡   ‖¦‖¦‖   DevNet Associate   v1.0
        CISCO

Introduction

1.0.1

First Time in This Course

Welcome to the DevNet Associate (DEVASC) course. The DEVASC course is designed for people who want to learn the knowledge and skills they need to work in network programming and automation. In addition to learning basic coding and

Your Lab Environment

1.1.1

Set Up Your Lab Environment

Your lab environment for this course is actually a set of virtual machines. With virtualization, one or more virtual computers operate inside one physical computer. Virtual computers that run within physical computers are called virtual machines (VMs). VMs are often called guests, and physical computers are often called hosts. Anyone with a modern computer and operating system can run virtual machines.

In this topic, you will set up a specific VM on your own PC. You will use this VM to complete most of the labs in this course.

1.1.2

Lab - Install the Virtual Lab Environment

A Linux-based virtual machine image file has been created for you to install on your computer. In this lab, you will download and import this image file using a desktop virtualization application.

In this lab, you will complete the following objectives:

- Part 1: Prepare a Computer for Virtualization
- Part 2: Explore the DEVASC VM GUI
- Part 3: Create Lab Environment Accounts
- Part 4: Install Webex Teams on your Device

Install the Virtual Machine Lab Environment

Lab - Install the Virtual Machine Lab Environment

Objectives

Part 1: Prepare a Computer for Virtualization

Part 2: Explore the DEVASC VM GUI

Part 3: Create Lab Environment Accounts

Part 4: Install Webex Teams on your Device

Background / Scenario

In this lab, you will install the DEVASC virtual machine (DEVASC VM) in Oracle VirtualBox. After completing the installation, you will explore the GUI interface. You will then create the necessary accounts for the services that you will use throughout the labs. Finally, you will install Webex Teams in the lab environment for communication with the other students in your class, and for use in later labs.

Required Resources

- Host computer with at least 4 GB of RAM and 15 GB of free disk space
- High-speed internet access to download Oracle VirtualBox and the DEVASC VM

Instructions

Part 1: Prepare a Computer for Virtualization

In this Part, you will download and install desktop virtualization software and the DEVASC VM. Your instructor

CISCO DevNet Associate v1.0

1.3.4

Quiz - Python Review

1. A student is learning Python using the interactive interpreter mode. The student issues the commands:

```
>>> routers=[]
>>> switches=[]
>>> devices=["RT1", "RT2", "RT3", "SW1", "SW2", "SW3"]
>>> devices=devices + ["RT4", "SW4"]
>>> for i in devices:
        if "R" in i:
            routers.append(i)
        else: switches.append(i)

>>> switches
```

What is the result?

- ['SW4']
- ['SW1', 'SW2', 'SW3']
- ['SW1', 'SW2', 'SW3', 'SW4']
- ['SW4', 'SW3', 'SW2', 'SW1']
- ['SW4', 'SW1', 'SW2', 'SW3']

2. A student is learning Python in the interactive interpreter mode. The student issues the commands:

```
>>> devicenames=["RT1", "RT2", "SW1", "SW2"]
>>> devicenames[-1]
```

What is the result?

Project Activity 1: Team Formation

In this activity, you will complete the following tasks:

- Choose a facilitator and a recorder.
- Conduct an ice-breaker activity.
- Discuss effective teamwork.
- Choose a role for each team member.

1. Choose Facilitator and Recorder

There are several methods of forming teams. Although there are some differences, most agree that the first step in forming a successful team involves a period of getting acquainted.

To begin, you will select two people to help facilitate the team formation process. These people will only have these roles for this activity. Later, you will choose new roles as part of an agile team.

Choose two team formation roles:

- A **facilitator** to make sure everyone has a chance to speak and contribute during this process, and that no one person is dominating the discussions.
- A **recorder** to take notes and summarize this process in the rubric.

Take a few minutes as a team to review the **DEVASC Project Rubric** for this activity. Rubric documents will be used throughout the project to help you record your process and prepare for your presentations. The recorder will document this information in the rubric sheet for this activity.

The role of the facilitator is to lead the team during the following parts of the activity:

1. Asking the ice-breaker questions
2. Discussing the requirements of the project
3. Discussing teamwork
4. Highlighting each person's skills and background

Note: The facilitator and recorder should participate in the activities with the other team members.

Course Outline

|	Module Title	Objectives
1	Course Introduction	• Setup the lab environment • Review Python programming and Linux skills
2	The DevNet Developer Environment	• Explore and get familiar with DevNet Resources
3	Software Development and Design	• Use best practices from software development and design with Python
4	Understanding and Using APIs	• Discover API Design and Architecture styles and Advanced uses of REST APIs • Interact with REST APIs using command line, graphical tools and Python code
5	Network Fundamentals	• Explain the features and functions of common network devices • Troubleshoot basic network connectivity issues
6	Application Deployment and Security	• Use current technologies to deploy and secure applications and data in a local or cloud environments
7	Infrastructure and Automation	• Explore software testing and deployment methods in automation and simulation environments and use DevOps tools for infrastructure automation
8	Cisco Platforms and Development	• Compare Cisco platforms used for collaboration, infrastructure management, and automation • Use APIs to interact with and automate Cisco platforms

Lab Equipment

Lab Equipment

2 Virtual Machines

- DEVASC Lab VM

- Cisco CSR1000v VM
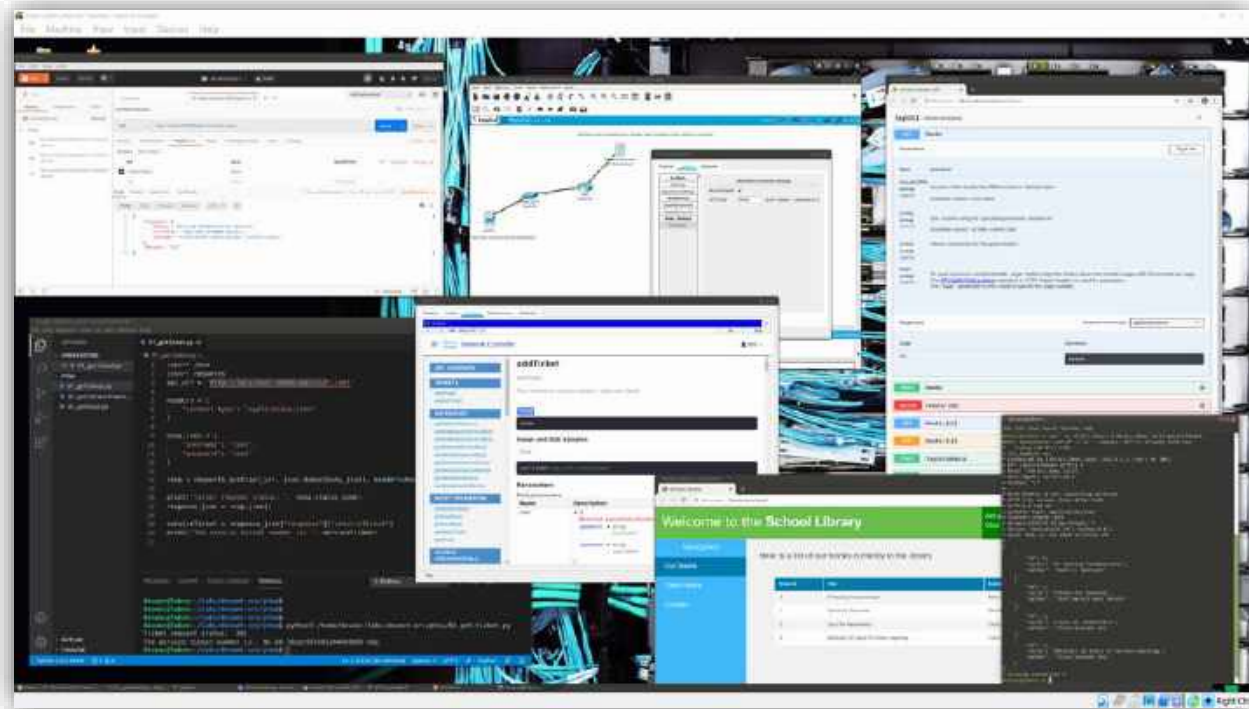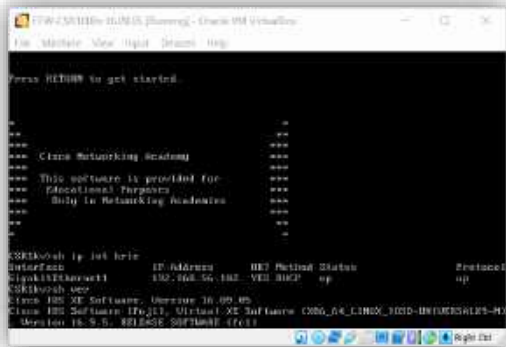
Instructor Training

Instructor Training 2-Prong Approach

Option 1:
Novice instructors

ITC-based Value-Add Course

Best in class training by a Cisco Qualified Instructor Trainers

Opportunity to obtain:
- ✓ Accreditation to Teach
- ✓ Certificate of Course Completion
- ✓ Letter of Merit
- ✓ Learning Badge
- ✓ Certification Voucher

Option 2:
DevNet Experienced instructors

Online Self-Paced Training-only Course

Flexible solution for DevNet, SDN, APIs and coding experienced instructors

Accreditation Option **2a**

ITC Remote Proctored Final Exam

Opportunity to obtain:
- ✓ Accreditation to Teach
- ✓ Certificate of Course Completion
- ✓ Letter of Merit
- ✓ Learning Badge

OR

Accreditation Option **2b**

DEVASC Certified

Opportunity to obtain:
- ✓ Accreditation to Teach

Course Resources

Course Resources

- Scope and Sequence

- Release Notes

- Instructor Planning Guides (includes Instructor PPTs)

- Instructor Lab Source Files

- Instructor Packet Tracer Source Files

- Packet Tracer Activity Source Files

- Student Lab Source Files

- Student Packet Tracer Source Files

- Exam Design Documents

- Course & VMs FAQs
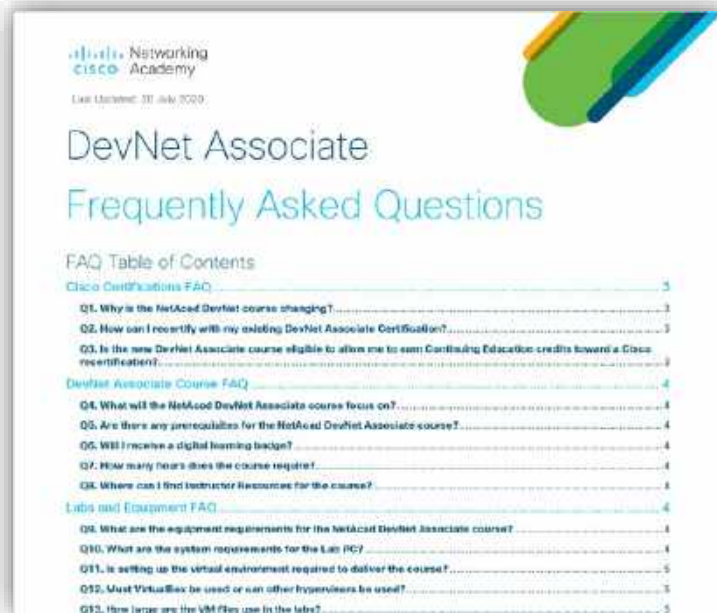
PCAP: Programming Essentials in Python

Course Overview
Designed as easy to understand and beginner-friendly course focusing on various data collections, manipulation tools, logic and bit operations and creating basic REST APIs.

Benefits
Learn to design, write, debug, and run programs encoded in the Python language. No prior programming knowledge is required. The course begins with the very basics guiding you step by step until you become adept at solving more complex problems.

Prepare for Careers
- ✓ Develop fundamental programming skills
- ✓ Prepare for PCEP and PCAP certification exam
- ✓ Build your foundation to pursue more specialized networking and software development skills

Course Details

Target Audience: Secondary, 2-year and 4-year college students

Estimated Time to Completion: 60-70 hours

Prerequisites: None

Course Delivery: Instructor-led or Self-paced

Learning Component Highlights:
- ✓ 5 modules of interactive instructional content
- ✓ 30+ practice labs
- ✓ Built-in online tool for labs and practice
- ✓ Chapter and final exams

Course Recognitions: Certificate of Completion

Recommended Next Course:
DevNet Associate

Requirements & Resources
- **ASC Alignment Required:** No
- **Instructor Training Required:** No
- **Physical Equipment Required:** No
- **Discount Availability:** Yes

Certification Aligned
PCEP: Certified Entry-Level Python Programmer
PCAP: Certified Associate in Python Programming

Self-Enroll Here: https://www.netacad.com/portal/web/self-enroll/c/course-1091387

NDG Linux Essentials

Course Overview
This course teaches fundamentals of the Linux operating system, command line, and open source programming concepts.

Benefits
Nearly every IT job requires some Linux knowledge. Gain hands-on practice with Linux commands through the Linux virtual machine embedded in the course.

Prepare for Careers
- ✓ Develop fundamental operating system skills for entry-level IT jobs
- ✓ Prepare for LPI certificate exam
- ✓ Fulfill prerequisites to pursue more specialized IT and networking skills

Course Details

Target Audience: Secondary and 2-year college students

Estimated Time to Completion: 70 hours

Prerequisites: None

Course Delivery: Instructor-led or Self-paced

Learning Component Highlights:
- ✓ 16 chapters and 13 practice labs
- ✓ Built-in virtual machine to experiment with Linux commands
- ✓ Learner-directed activities
- ✓ Chapter, midterm, and final exams

Course Recognitions: Letter of Completion

Recommended Next Course:
NDG Linux I

In partnership with **..ıllNDG**

Requirements & Resources
- **ASC Alignment Required:** No
- **Instructor Training Required:** No
- **Physical Equipment Required:** No
- **Discount Availability:** Yes

Certification Aligned
Linux Professional Institute (LPI) Linux Essentials Professional Development Certificate

Self-Enroll Here: https://www.netacad.com/portal/web/self-enroll/c/course-1091386

Networking Essentials

Course Overview

Networking Essentials teaches networking based on environments students may encounter in daily life, including small office and home office networking. This course provides an engaging, self-paced learning experience using Packet Tracer simulation, interactive activities, and learning with your own devices at home.

Benefits

Develop a foundational understanding of the high-level network architecture and how a network operates.

Prepare for Careers

✓ For developers, cybersecurity, business analysts, or other professionals: gain essential networking knowledge

✓ For students: a launching point for many career pathways, from cybersecurity to software to business and more

Course Details

Target Audience: High school, secondary and 2-year college vocational students, college and university students studying IT and non-IT fields, career changers

Estimated Time to Completion: 70 hours

Prerequisites: None

Course Delivery: Self-Paced, Instructor-led

Learning Component Highlights:
✓ 20 modules and 19 practice labs
✓ 24 Cisco Packet Tracer activities
✓ 130+ interactive activities, videos, & quizzes
✓ 5 module exams
✓ 1 final exam and 1 skills assessment (Instructor-led only)

Course Recognitions: Certificate of Completion, Digital Badge (Instructor-led only)

Recommended Next Course:
CCNA: Introduction to Networks (ITN), Cybersecurity Essentials, or DevNet Associate

Requirements & Resources

• **ASC Alignment Required:** No
• **Instructor Training Required:** No
• **Physical Equipment Required:** No (uses Packet Tracer and devices you already have at home)
• **Voucher Availability:** Not Applicable

Practice with Cisco Packet Tracer

Self-Enroll Here: https://www.netacad.com/portal/web/self-enroll/m/course-138349

Networking Academy Curriculum Portfolio

Explore

Introduction to exciting opportunities in technology.

- ▲ Get Connected
- ▲ Introduction to Packet Tracer
- ▲ NDG Linux Unhatched
- ▲ Introduction to Cybersecurity
- ▲ Cybersecurity Essentials
- ▲ Introduction to IoT
- ▲ Entrepreneurship

Career

Preparation for entry level positions.

Digital Essentials

- ★ ● IT Essentials
- ● ▲ NDG Linux Essentials
- ▲ Networking Essentials
- ● ▲ PCAP: Programming Essentials in Python
  Hackathon Playbook (Design Thinking)

Networking

CCNA:
- ★ ● ■ Introduction to Networks (ITN)
- ★ ● ■ Switching, Routing, & Wireless Essentials (SRWE)
- ★ ● ■ Enterprise Networking, Security & Automation (ENSA)

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

Programmable Infrastructure

Infrastructure Automation:
- ★ ● ■ DevNet Associate
  - Workshop: Network Programmability
  - Workshop: Experimenting with REST APIs
  - Workshop: Model-Driven Programmability

Internet of Things:
- ★ IoT Fundamentals: Connecting Things
- ★ IoT Fundamentals: Big Data & Analytics

Cybersecurity

- ★ ● ■ CyberOps Associate
- ★ ■ CCNA Security
- IoT Security

Practice

Increase mastery with hands-on tools & experiences

Packet Tracer	Gaming	Prototyping Lab	Virtual Labs	Assessments	Physical Equipment

Complementary Offerings

Additional offerings available from Partners.

NDG
- ● ▲ NDG Linux I
- ● ▲ NDG Linux II
- NDG NetLab+
- NDG CyberOps Lab

OPENEDG
- ● CLA: Programming Essentials in C
- ● CLP: Advanced Programming in C
- ● CPA: Programming Essentials in C++
- ● CPP: Advanced Programming in C++

○ Aligns to Certification   □ Instructor Training Required   △ Self-paced   ☆ ASC Alignment Required

Let's Build the IT Team of the Future!

Changing What We Teach

The IT Team of the Future

Next Steps

- Apply to Become an Academy:
  https://www.netacad.com/become-an-academy

- For more information:
  https://www.netacad.com/educators

- Feel free to reach out to your CSR Manager for any additional questions:
  - Sara Shreve, sashreve@cisco.com

CISCO. Networking Academy