You make **possible**

DevNet Certifications: Bringing Software Practices and Software Skills to Networking

Ryan Rose, Technical Program Manager

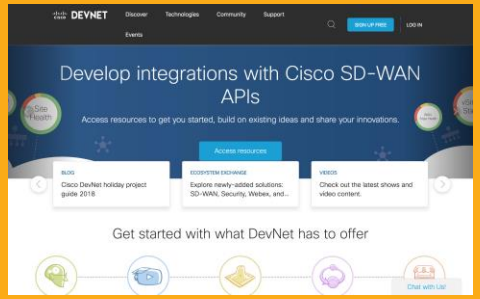
BRKCRT-1232

Agenda

- Introduction
- DevNet overview
- DevNet Certifications overview
- Review of changes to Cisco Certification Portfolio
- Updates to Recertification and Continuing Education
- Review of tools and training to help you get prepared
- Next Steps

DevNet is…

A website



The DevNet website, **developer.cisco.com**, is free-to-use and provides learning & sandbox environments for those trying to learn coding and testing apps

A community

DevNet is now a community of **500,000+ developers**, leveraging code and sharing code to build better solutions.

A place to start

CISCO DEVNET

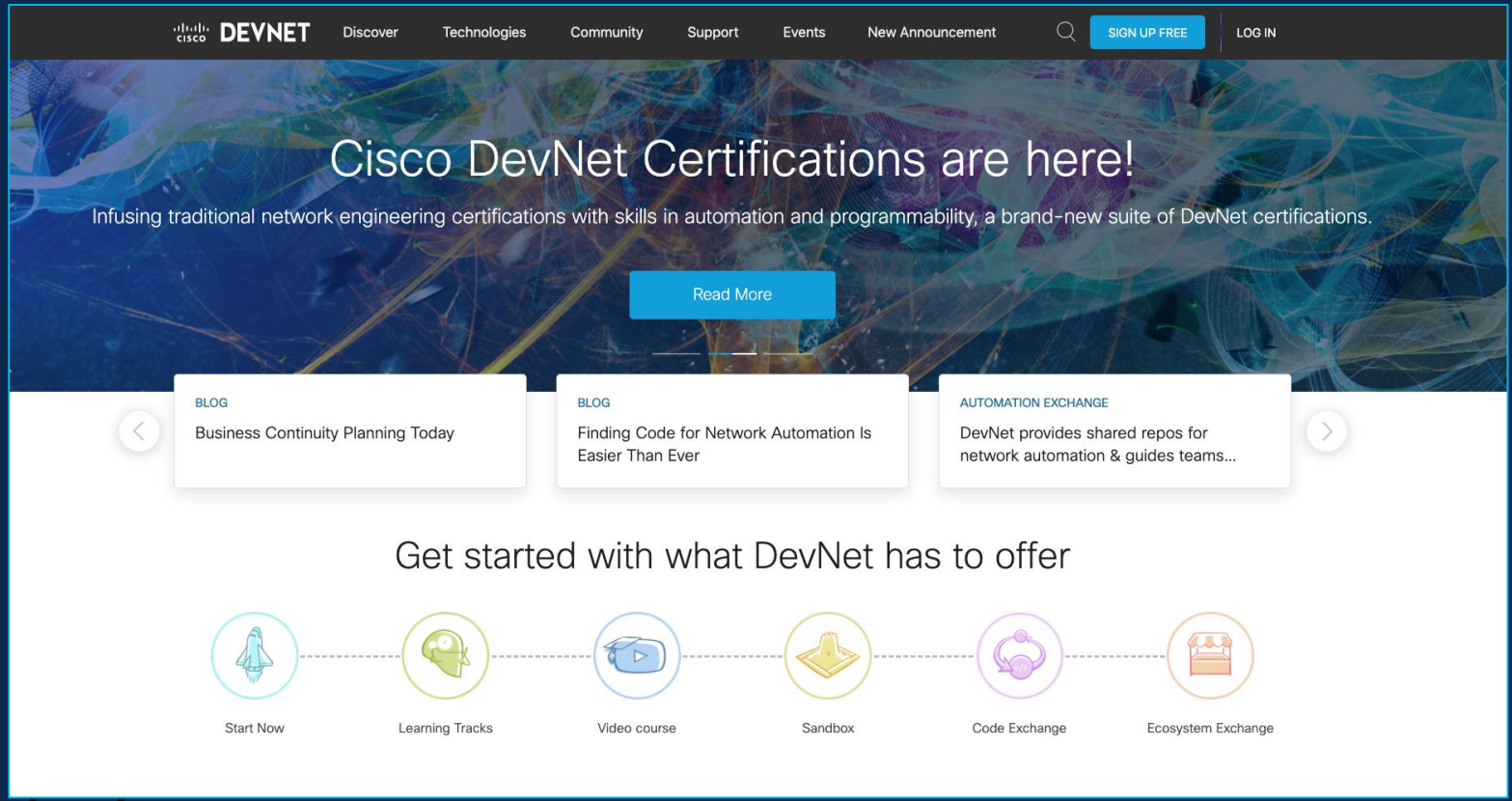
LEARN CODE INSPIRE CONNECT

DevNet helps developers and IT professionals who want to **write applications and develop integrations** with Cisco products, platforms, and APIs.

The single resource for everything “developer” at Cisco.

DevNet Tools and Resources

developer.cisco.com



Review of the DevNet Certifications and the Changes to the Larger Cisco Certification Portfolio

You make networking **possible**

Introducing Cisco's Expanded Certification Suite

Cisco Certification Program offerings launched Feb. 24, 2020

	Associate Level	Specialist Level	Professional Level	Expert Level
Engineering				
Software				

Building Teams with Complementary Skills

DevNet Certified Associate and the Cisco Certified Network Associate

DevNet Certified Associate

Skilled in software development, network programmability, automation.

Aware of Cisco hardware, technologies, and solutions and network fundamentals.

Cisco Certified Network Associate

Skilled in how to operate and maintain Cisco hardware in a small enterprise network.

Aware of programmability and network automation capabilities.

Complementary balance and role alignment

How our program works today – one portfolio

Associate Level

CISCO CERTIFIED CCNA

One Exam

CISCO CERTIFIED DEVNET Associate

One Exam

Specialist Level

CISCO CERTIFIED SPECIALIST

One Exam:
Every written proctored exam (except CCNA)
= Cisco Certified Specialist

CISCO CERTIFIED DEVNET SPECIALIST

CISCO CERTIFIED DEVNET SPECIALIST

One Exam:

Professional Level

CISCO CERTIFIED CCNP

Two Exams:
1 concentration exam and 1 technology core in any order,
but from the same track

Technology Core Exam	Concentration Exam
Enterprise	C C C C C
Security	C C C C C
Service Provider	C C C C C
Collaboration	C C C C C
Data Center	C C C C C

Automation and programmability cross functional course/exam option focused within technology track for CCNP certification

CISCO CERTIFIED DEVNET Professional

Two Exams:
1 DevNet core
and 1 concentration exam in any order, but from the DevNet track

Technology Core exam	Concentration exam
DevNet	C C C C C C C C

Expert Level

CISCO CERTIFIED CCIE

Lab Exam

L L	
L	1 technology core and 1 CCIE lab in same track
L	
L	
L	

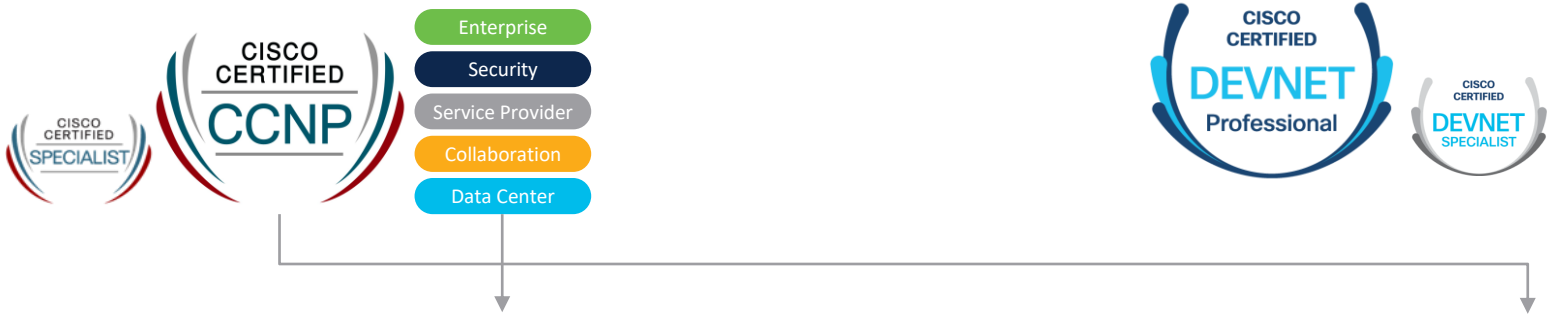
CISCO CERTIFIED DEVNET Expert

Future Offering

Future offering

Certification Paths

Professional and Specialist Certifications



Enterprise

- Implementing and Operating Cisco Enterprise Network Core Technologies
- Implementing Cisco Enterprise Advanced Routing and Services
- Designing Cisco Enterprise Wireless Networks
- Implementing Cisco Enterprise Wireless Networks
- Designing Cisco Enterprise Networks
- Implementing Cisco SD-WAN Solutions
- Automating and Programming Cisco Enterprise Solutions

Security

- Implementing and Operating Cisco Security Core Technologies
- Securing Networks with Cisco Firepower
- Implementing Secure Solutions with Virtual Private Networks
- Securing Email with Cisco Security Appliances
- Securing the Web with Cisco Web Security Appliance
- Implementing and Configuring Cisco Identity Services Engine
- Automating and Programming Cisco Security Solutions

Service Provider

- Implementing and Operating Cisco Service Provider Network Core Technologies
- Implementing Cisco Service Provider Advanced Routing Solutions
- Implementing Cisco Service Provider VPN Services
- Automating and Programming Cisco Service Provider Solutions

Collaboration

- Implementing and Operating Cisco Collaboration Core Technologies
- Implementing Cisco Collaboration Applications
- Implementing Cisco Advanced Call Control and Mobility Services
- Implementing Cisco Collaboration Cloud and Edge Solutions
- Automating and Programming Cisco Collaboration Solutions

Data Center

- Implementing and Operating Cisco Data Center Core Technologies
- Implementing Cisco Storage Area Networking
- Implementing Cisco Application Centric Infrastructure
- Designing Cisco Data Center Infrastructure
- Troubleshooting Cisco Data Center Infrastructure
- Automating and Programming Cisco Data Center Solutions

DevNet

- Developing Applications using Cisco Core Platforms & APIs
- Implementing DevOps Solutions and Practices using Cisco Platforms
- Developing Solutions using Cisco IoT & Edge Platforms
- Developing Applications for Cisco Webex and Webex Devices
- Automating and Programming Cisco Enterprise Solutions
- Automating and Programming Cisco Security Solutions
- Automating and Programming Cisco Service Provider Solutions
- Automating and Programming Cisco Collaboration Solutions
- Automating and Programming Cisco Data Center Solutions

Cisco DevNet Track: Currently Composed of 10 Exams

Entry: Associate Level → Next Step: Professional Level → Future Goal: Expert

Entry exam

E DevNet Associate Exam

DevNet concentration

Options: 1 technology core & 1 concentration exam in any order, but from the same DevNet track

DevNet Technology Core Exam

- C **ENTERPRISE NETWORKING:** Automating and Programming Cisco Enterprise Solutions
- C **SECURITY:** Automating and Programming Cisco Security Solutions
- C **SERVICE PROVIDER:** Automating and Programming Cisco Service Provider Solutions
- C **COLLABORATION:** Automating and Programming Cisco Collaboration Solutions
- C **DATA CENTER:** Automating and Programming Cisco Data Center Solutions
- C **DEVOPS:** Implementing DevOps Solutions and Practices using Cisco Platforms
- C **IOT:** Developing Solutions using Cisco IoT & Edge Platforms
- C **WEBEX:** Developing Applications for Cisco Webex and Webex Devices

DevNet lab

Options: 1 technology core & 1 lab in the same track

- L TBD
- L TBD
- L TBD

DevNet Associate Exam Topics

1.0 Software Development and Design 15%

1.1 Compare data formats (XML, JSON, and YAML)
1.2 Describe parsing of common data format (XML, JSON, and YAML) to Python data structures
1.3 Describe the concepts of test-driven development
1.4 Compare software development methods (agile, lean, and waterfall)
1.5 Explain the benefits of organizing code into methods / functions, classes, and modules
1.6 Identify the advantages of common design patterns (MVC and Observer)
1.7 Explain the advantages of version control
1.8 Utilize common version control operations with Git
- 1.8.a Clone
- 1.8.b Add/remove
- 1.8.c Commit
- 1.8.d Push / pull
- 1.8.e Branch
- 1.8.f Merge and handling conflicts
- 1.8.g diff

2.0 Understanding and Using APIs 20%

2.1 Construct a REST API request to accomplish a task given API documentation
2.2 Describe common usage patterns related to webhooks
2.3 Identify the constraints when consuming APIs
2.4 Explain common HTTP response codes associated with REST APIs
2.5 Troubleshoot a problem given the HTTP response code, request and API documentation
2.6 Identify the parts of an HTTP response (response code, headers, body)
2.7 Utilize common API authentication mechanisms: basic, custom token, and API keys
2.8 Compare common API styles (REST, RPC, synchronous, and asynchronous)
2.9 Construct a Python script that calls a REST API using the requests library

3.0 Cisco Platforms and Development 15%

3.1 Construct a Python script that uses a Cisco SDK given SDK documentation
3.2 Describe the capabilities of Cisco network management platforms and APIs (Meraki, Cisco DNA Center, ACI, Cisco SD-WAN, and NSO)
3.3 Describe the capabilities of Cisco compute management platforms and APIs (UCS Manager, UCS Director, and Intersight)
3.4 Describe the capabilities of Cisco collaboration platforms and APIs (Webex Teams, Webex devices, Cisco Unified Communication Manager including AXL and UDS interfaces, and Finesse)
3.5 Describe the capabilities of Cisco security platforms and APIs (Firepower, Umbrella, AMP, ISE, and ThreatGrid)
3.6 Describe the device level APIs and dynamic interfaces for IOS XE and NX-OS
3.7 Identify the appropriate DevNet resource for a given scenario (Sandbox, Code Exchange, support, forums, Learning Labs, and API documentation)
3.8 Apply concepts of model driven programmability (YANG, RESTCONF, and NETCONF) in a Cisco environment
3.9 Construct code to perform a specific operation based on a set of requirements and given API reference documentation such as these:
- 3.9.a Obtain a list of network devices by using Meraki, Cisco DNA Center, ACI, Cisco SD-WAN, or NSO
- 3.9.b Manage spaces, participants, and messages in Webex Teams
- 3.9.c Obtain a list of clients / hosts seen on a network using Meraki or Cisco DNA Center

4.0 Application Deployment and Security 15%

4.1 Describe benefits of edge computing
4.2 Identify attributes of different application deployment models (private cloud, public cloud, hybrid cloud, and edge)
4.3 Identify the attributes of these application deployment types
- 4.3.a Virtual machines
- 4.3.b Bare metal
- 4.3.c Containers

4.4 Describe components for a CI/CD pipeline in application deployments
4.5 Construct a Python unit test
4.6 Interpret contents of a Dockerfile
4.7 Utilize Docker images in local developer environment
4.8 Identify application security issues related to secret protection, encryption (storage and transport), and data handling
4.9 Explain how firewall, DNS, load balancers, and reverse proxy in application deployment
4.10 Describe top OWASP threats (such as XSS, SQL injections, and CSRF)
4.11 Utilize Bash commands (file management, directory navigation, and environmental variables)
4.12 Identify the principles of DevOps practices

5.0 Infrastructure and Automation 20%

5.1 Describe the value of model driven programmability for infrastructure automation
5.2 Compare controller-level to device-level management
5.3 Describe the use and roles of network simulation and test tools (such as VIRL and pyATS)
5.4 Describe the components and benefits of CI/CD pipeline in infrastructure automation
5.5 Describe principles of infrastructure as code
5.6 Describe the capabilities of automation tools such as Ansible, Puppet, Chef, and Cisco NSO
5.7 Identify the workflow being automated by a Python script that uses Cisco APIs including ACI, Meraki, Cisco DNA Center, or RESTCONF
5.8 Identify the workflow being automated by an Ansible playbook (management packages, user management related to services, basic service configuration, and start/stop)
5.9 Identify the workflow being automated by a bash script (such as file management, app install, user management, directory navigation)
5.10 Interpret the results of a RESTCONF or NETCONF query
5.11 Interpret basic YANG models
5.12 Interpret a unified diff
5.13 Describe the principles and benefits of a code review process
5.14 Interpret sequence diagram that includes API calls

6.0 Network Fundamentals 15%

6.1 Describe the purpose and usage of MAC addresses and VLANs
6.2 Describe the purpose and usage of IP addresses, routes, subnet mask / prefix, and gateways
6.3 Describe the function of common networking components (such as switches, routers, firewalls, and load balancers)
6.4 Interpret a basic network topology diagram with elements such as switches, routers, firewalls, load balancers, and port values
6.5 Describe the function of management, data, and control planes in a network device
6.6 Describe the functionality of these IP Services: DHCP, DNS, NAT, SNMP, NTP
6.7 Recognize common protocol port values (such as, SSH, Telnet, HTTP, HTTPS, and NETCONF)
6.8 Identify cause of application connectivity issues (NAT problem, Transport Port blocked, proxy, and VPN)
6.9 Explain the impacts of network constraints on applications

Available at developer.cisco.com/certification/exam-topic-associate/

DevNet Core Exam Topics

1.0 Software Development and Design 20%

1.1 Describe distributed applications related to the concepts of front-end, back-end, and load balancing
1.2 Evaluate an application design considering scalability and modularity
1.3 Evaluate an application design considering high-availability and resiliency (including on-premises, hybrid, and cloud)
1.4 Evaluate an application design considering latency and rate limiting
1.5 Evaluate an application design and implementation considering maintainability
1.6 Evaluate an application design and implementation considering observability
1.7 Diagnose problems with an application given logs related to an event
1.8 Evaluate choice of database types with respect to application requirements (such as relational, document, graph, columnar, and Time Series)
1.9 Explain architectural patterns (monolithic, services oriented, microservices, and event driven)
1.10 Utilize advanced version control operations with Git
- 1.10.a Merge a branch
- 1.10.b Resolve conflicts
- 1.10.c git reset
- 1.10.d git checkout
- 1.10.e git revert

1.11 Explain the concepts of release packaging and dependency management
1.12 Construct a sequence diagram that includes API calls

2.0 Using APIs 20%

2.1 Implement robust REST API error handling for time outs and rate limits
2.2 Implement control flow of consumer code for unrecoverable REST API errors
2.3 Identify ways to optimize API usage through HTTP cache controls
2.4 Construct an application that consumes a REST API that supports pagination
2.5 Describe the steps in the OAuth2 three-legged authorization code grant flow

3.0 Cisco Platforms 20%

3.1 Construct API requests to implement chatops with Webex Teams API
3.2 Construct API requests to create and delete objects using Firepower device management (FDM)
3.3 Construct API requests using the Meraki platform to accomplish these tasks
- 3.3.a Use Meraki Dashboard APIs to enable an SSID
- 3.3.b Use Meraki location APIs to retrieve location data

3.4 Construct API calls to retrieve data from Intersight
3.5 Construct a Python script using the UCS APIs to provision a new UCS server given a template
3.6 Construct a Python script using the Cisco DNA center APIs to retrieve and display wireless health information
3.7 Describe the capabilities of AppDynamics when instrumenting an application
3.8 Describe steps to build a custom dashboard to present data collected from Cisco APIs

4.0 Application Deployment and Security 20%

4.1 Diagnose a CI/CD pipeline failure (such as missing dependency, incompatible versions of components, and failed tests)
4.2 Integrate an application into a prebuilt CD environment leveraging Docker and Kubernetes
4.3 Describe the benefits of continuous testing and static code analysis in a CI pipeline
4.4 Utilize Docker to containerize an application
4.5 Describe the tenets of the "12-factor app"
4.6 Describe an effective logging strategy for an application
4.7 Explain data privacy concerns related to storage and transmission of data
4.8 Identify the secret storage approach relevant to a given scenario
4.9 Configure application specific SSL certificates
4.10 Implement mitigation strategies for OWASP threats (such as XSS, CSRF, and SQL injection)
4.11 Describe how end-to-end encryption principles apply to APIs

5.0 Infrastructure and Automation 20%

5.1 Explain considerations of model-driven telemetry (including data consumption and data storage)
5.2 Utilize RESTCONF to configure a network device including interfaces, static routes, and VLANs (IOS XE only)
5.3 Construct a workflow to configure network parameters with:
- 5.3.a Ansible playbook
- 5.3.b Puppet manifest

5.4 Identify a configuration management solution to achieve technical and business requirements
5.5 Describe how to host an application on a network device (including Catalyst 9000 and Cisco IOx-enabled devices)

Available at developer.cisco.com/certification/devnet-core

DevNet Certification Help Build Skills for Automation and Digital Transformation

DevNet Associate

DevNet Professional

DevNet Specialist
Enterprise Automation

DevNet Specialist
Data Center Automation

DevNet Specialist
Service Provider Automation

DevNet Specialist
Security Automation

DevNet Specialist
Collaboration Automation

DevNet Specialist
IoT

DevNet Specialist
WebEx

DevNet Specialist
DevOps

Training for new job roles
DevSecOps Engineer

Professional certification	Technology concentrations
CCNP Security	Cisco Specialist: Security Automate security operations
	Cisco DevNet Specialist: DevOps Securely deploy applications
	Cisco DevNet Specialist: Webex Build chat bots for alerting and monitoring

Updates to Recertification and Continuing Education

You make security **possible**

How our recertification policies are changing

Previous Program

Different recertification period depending on certification type

Continuing education for CCIEs only

Credits required for recertification:

CCIE: 100

New Program in Effect

- 3-year recertification period for all certified individuals, beginning at the recertifying event date
- Continuing education for all levels of certification
- Credits required for recertification:
  - CCNA: 30
  - Specialist: 40
  - CCNP: 80
  - CCIE: 120

How our CE policies are changing

Previous Program

CCIE CE credit requirquirement:100

Cisco Live activities: 70 points cap

Item writing activities: 20 points cap

Administrative Fee: $300

New Program in Effect

- CCIE CE credit requirement: 120
- Cisco Live activities: No points cap
- Item writing activities: No points cap
- Administrative Fee: $0

Recertification policy as implemented on February 24, 2020

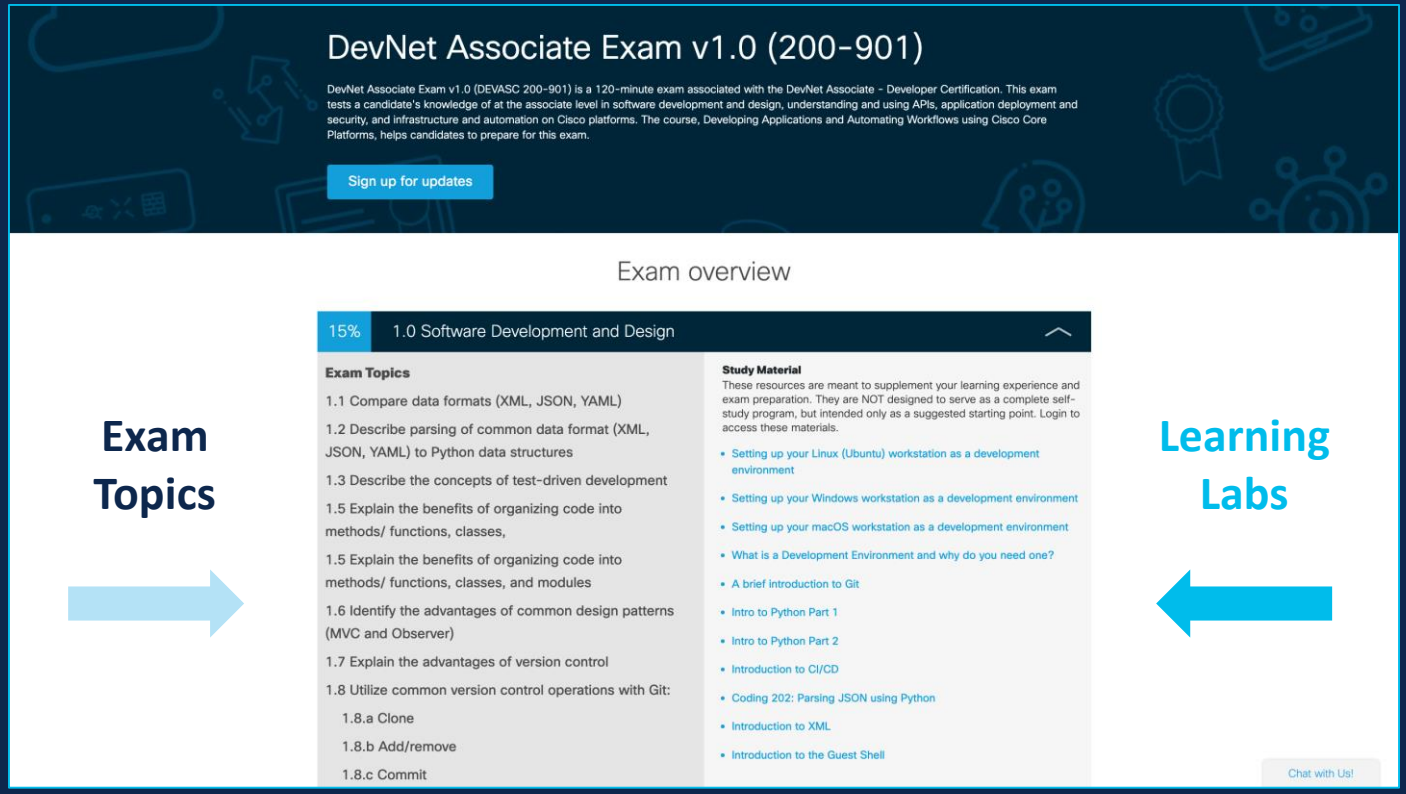
Certification level	Duration	Examination only	Examination and Continuing Education	Continuing Education only
Associate Recertification	3 years	• Pass any one Associate exam • Pass any one professional concentration exam • Pass one technology core exam • Pass one CCIE lab exam		Earn 30 CE credits
Specialist Certification	3 years	• Pass any one professional concentration exam • Pass one technology core exam • Pass one CCIE lab exam		Earn 40 CE credits
Professional Recertification	3 years	• Pass one technology core exam • Pass any two professional concentration exams • Pass one CCIE lab exam	• Pass any one professional concentration exam and earn 40 CE credits	Earn 80 CE credits
CCIE Recertification	3 years	• Pass any one expert-level certification exam • Pass any one CCIE lab exam • Pass any three professional concentration exams • Pass one technology core exam and pass any one professional concentration exam. (This is also a CCNP certification if done in the same track.)	• Pass one technology core exam and earn 40 CE credits • Pass any two professional concentration exams and earn 40 CE credits • Pass any one professional concentration exam and earn 80 CE credits	Earn 120 CE credits

Next Steps and New DevNet Training and Tools

You make the power of data **possible**

Find More Information on DevNet, CLN, Cisco.com

Find learning lab and sandbox offerings to start learning journey



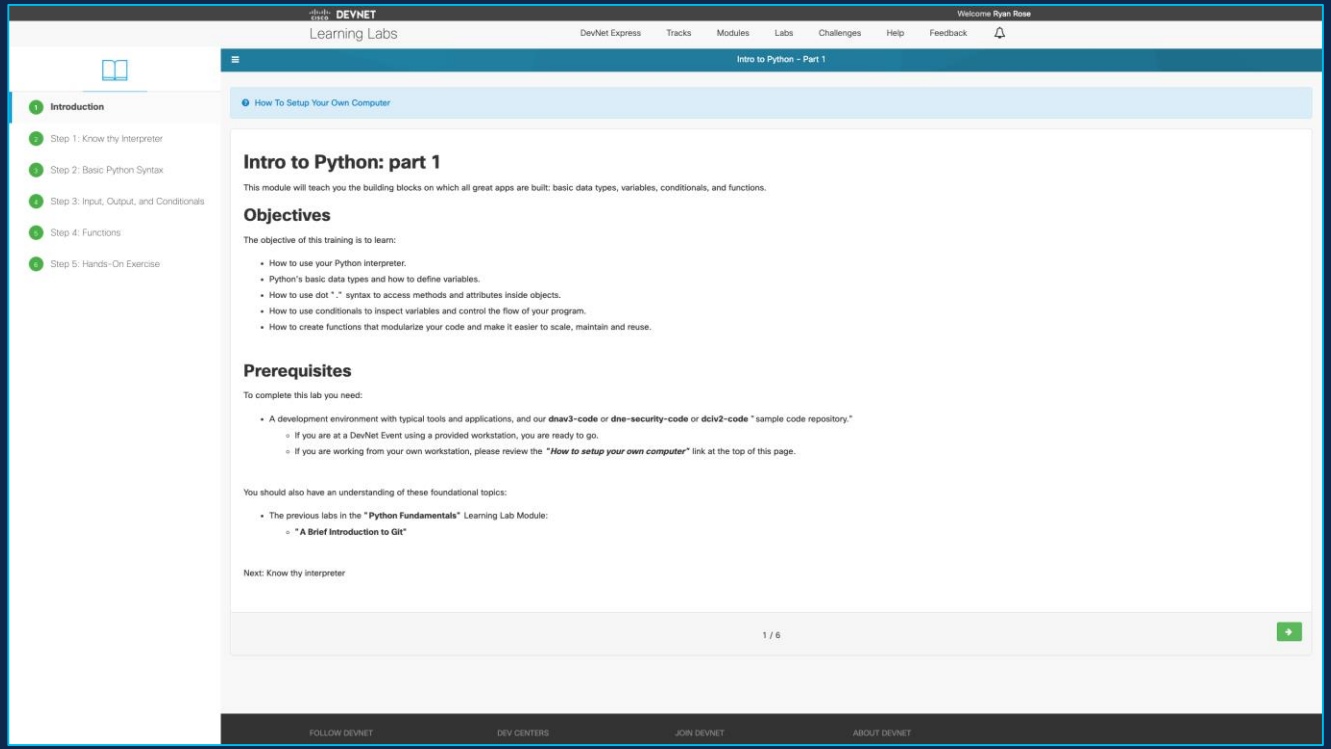
Exam Topics

Learning Labs

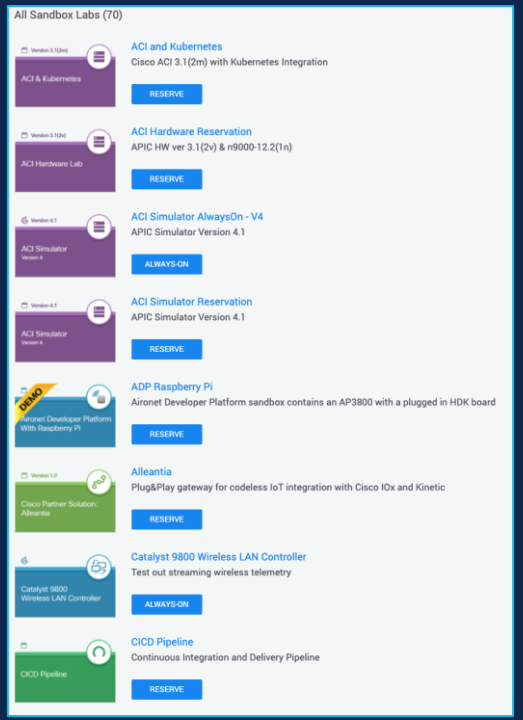
developer.cisco.com/certification

cisco.com/nextlevel

How the Free DevNet Learning Labs Look and Work



Intro to Python Course



DevNet Sandboxes

DevNet Certification Training Materials

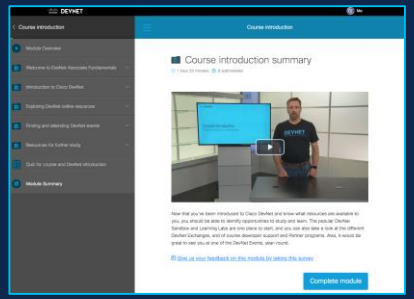
Certification	Associated Exam	Course Name	Type	Availability Methods
DevNet Associate	DEVASC	*Developing Applications and Automating Workflows using Cisco Core Platforms*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet Professional and DevNet Core Specialist	DEVCOR	*Developing Applications using Cisco Core Platforms and APIs*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet EN Automation Specialist	ENAUTO	*Implementing Automation for Cisco Enterprise Solutions*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet Data Center Automation Specialist	DCAUTO	*Implementing Automation for Cisco Data Center Solutions*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet Security Automation Specialist	SAUTO	*Implementing Automation for Cisco Security Solutions*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet Collaboration Automation Specialist	CLAUTO	*Implementing Cisco Collaboration Automation Solutions*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet Service Provider Automation Specialist	SPAUTO	*Implementing Cisco Service Provider Automation Solutions*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet DevOps Automation Specialist	DEVOPS	*Implementing DevOps Solutions and Practices using Cisco Platforms*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet IoT Specialist	DEVIOT	*Developing Solutions Using Cisco IoT and Edge Platforms*	ILT/ELT	Cisco Learning Locator (ILT); CPLL & CLN Store (ELT)
DevNet Webex Specialist	DEVWBX	*Developing WebEx Solutions*	ELT	CPLL & CLN Store (ELT)

The 61 Cisco Training Courses Supporting the Updated Cisco Certification Program

Architecture	Course
Cloud / Automation	*Deploying Cloud Connect Solutions with Cisco Cloud Services Router 1000V*
Collaboration	*Implementing and Operating Cisco Collaboration Core Technologies*
Collaboration	*Understanding Cisco Collaboration Foundations*
Collaboration	*Implementing Cisco Advanced Call Control and Mobility Services*
Collaboration	*Implementing Cisco Collaboration Cloud and Edge Solutions*
Collaboration	*Implementing Cisco Collaboration Applications*
Data Center	*Implementing Cisco Application Centric Infrastructure – Advanced*
Data Center / Compute	*Implementing Cisco Application Centric Infrastructure*
Data Center / Compute	*Understanding Cisco Data Center Foundations*
Data Center / Compute	*Configuring Cisco NX-OS Switches and Fabrics in the Data Center*
Data Center / Compute	*Introducing Cisco NX-OS Switches and Fabrics in the Data Center*
Data Center / Compute	*Implementing and Operating Cisco Data Center Core Technologies*
Data Center / Compute	*Configuring Cisco MDS 9000 Series Switches*
Data Center / Compute	*Designing Cisco Data Center Infrastructure*
Data Center / Compute	*Configuring Cisco Nexus 9000 Series Switches in ACI Mode*
Data Center / Compute	*Implementing Cisco HyperFlex*
Data Center / Compute	*Configuring Cisco MDS 9000 Series Switches*
Data Center / Compute	*Introducing Cisco Nexus 9000 Switches in NX-OS Mode*

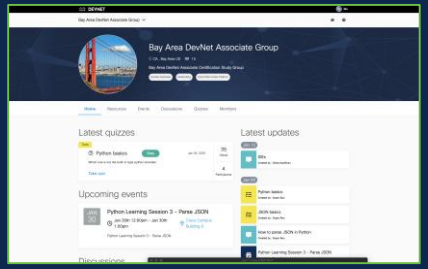
DevNet Training and Tools Supporting Certification

DevNet Associate Fundamentals Training



The DevNet Associate Fundamentals training course, built by DevNet team members, is a next generation learning experience, offering high-quality content and an interactive all-in-one learning experience with built-in integrated labs.

New DevNet Study Groups



An online community platform allowing people to come together and learning Cisco technologies and certifications with curated learning material. The pricing for the DevNet Study Group offering is free for a limited time, while the program is in beta.

Learn more: developer.cisco.com/certification/new

Who is this for?

Community-lead Group

Community-lead groups for Cisco Certification- anyone can discover these groups by topic/company/region etc and request to be part of the group

Partner-lead Group

Partner can form internal study group on this platform and learn about Cisco technologies and certifications

SE-lead Group

Systems Engineers can form and lead a study group to help their customers

Your Next Steps

3 things you can do today to start getting ready

Register with DevNet at developer.cisco.com/certification

Review the Exam Topics and learn what skills you will need to prepare for certification

Find the DevNet learning labs, videos and sandboxes that align to your learning goals

All new exams available now

Thank you for your time today.

Thank you

You make **possible**