CyberSPAIS
Security Privacy & Assurance of Information Systems

Cisco Certified Network Associate (CCNA)

CCNA Overview

- Who Is Eligible for This Course?
  - Freshers looking for IT & Networking Knowledge
- Course Duration
  - 1.5 Months (60 Hours)
- Course Syllabus
  - Network Fundamentals
  - Network Access
  - IP Connectivity
  - IP Services
  - Security Fundamentals
  - Automation and Programmability
- Why Training @CyberSPAIS?
  - Job Oriented Industry Relevant Curriculum
  - Based On Latest Cyber Security Topics & Trends
  - 100% Assistance for Placements & Internships
  - Industry Experienced & Certified Trainer
  - Concepts Explained with Industry Scenarios
  - Comprehensive Hands-on Sessions & Labs
  - Regular Module Wise Assessments & Evaluations
  - Cybersecurity Projects & Internships
  - Thorough Preparation – Job Interview & Soft Skills
  - Arrangement To Write Certification Exams
  - Among The Top Cybersecurity Institutes in Kerala

CCNA Exam v1.0 (200-301)

Exam Description: CCNA Exam v1.0 (CCNA 200-301) is a 120-minute exam associated with the CCNA certification. This exam tests a candidate's knowledge and skills related to network fundamentals, network access, IP connectivity, IP services, security fundamentals, and automation and programmability. The course, Implementing and Administering Cisco Solutions (CCNA), helps candidates prepare for this exam.

The following topics are general guidelines for the content likely to be included on the exam. However, other related topics may also appear on any specific delivery of the exam. To better reflect the contents of the exam and for clarity purposes, the guidelines below may change at any time without notice.

20% 1.0 Network Fundamentals

1.1 Explain the role and function of network components

- 1.1.a Routers
- 1.1.b Layer 2 and Layer 3 switches
- 1.1.c Next-generation firewalls and IPS
- 1.1.d Access points
- 1.1.e Controllers (Cisco DNA Center and WLC)
- 1.1.f Endpoints
- 1.1.g Servers
- 1.1.h PoE

1.2 Describe characteristics of network topology architectures

- 1.2.a Two-tier
- 1.2.b Three-tier
- 1.2.c Spine-leaf
- 1.2.d WAN
- 1.2.e Small office/home office (SOHO)
- 1.2.f On-premise and cloud

1.3 Compare physical interface and cabling types

- 1.3.a Single-mode fiber, multimode fiber, copper
- 1.3.b Connections (Ethernet shared media and point-to-point)

1.4 Identify interface and cable issues (collisions, errors, mismatch duplex, and/or speed)

1.5 Compare TCP to UDP

1.6 Configure and verify IPv4 addressing and subnetting

1.7 Describe the need for private IPv4 addressing

1.8 Configure and verify IPv6 addressing and prefix

1.9 Describe IPv6 address types
- 1.9.a Unicast (global, unique local, and link local)
- 1.9.b Anycast
- 1.9.c Multicast
- 1.9.d Modified EUI 64

1.10 Verify IP parameters for Client OS (Windows, Mac OS, Linux)

1.11 Describe wireless principles
- 1.11.a Nonoverlapping Wi-Fi channels
- 1.11.b SSID
- 1.11.c RF
- 1.11.d Encryption

1.12 Explain virtualization fundamentals (server virtualization, containers, and VRFs)

1.13 Describe switching concepts
- 1.13.a MAC learning and aging
- 1.13.b Frame switching
- 1.13.c Frame flooding
- 1.13.d MAC address table

20% 2.0 Network Access

2.1 Configure and verify VLANs (normal range) spanning multiple switches
- 2.1.a Access ports (data and voice)
- 2.1.b Default VLAN
- 2.1.c Connectivity

2.2 Configure and verify interswitch connectivity
- 2.2.a Trunk ports
- 2.2.b 802.1Q
- 2.2.c Native VLAN

2.3 Configure and verify Layer 2 discovery protocols (Cisco Discovery Protocol and LLDP)

2.4 Configure and verify (Layer 2/Layer 3) EtherChannel (LACP)

2.5 Interpret basic operations of Rapid PVST+ Spanning Tree Protocol
- 2.5.a Root port, root bridge (primary/secondary), and other port names
- 2.5.b Port states (forwarding/blocking)
- 2.5.c PortFast

2.6 Describe Cisco Wireless Architectures and AP modes

2.7 Describe physical infrastructure connections of WLAN components (AP, WLC, access/trunk ports, and LAG)

2.8 Describe AP and WLC management access connections (Telnet, SSH, HTTP, HTTPS, console, and TACACS+/RADIUS)

2.9 Interpret the wireless LAN GUI configuration for client connectivity, such as WLAN creation, security settings, QoS profiles, and advanced settings

25% 3.0 IP Connectivity

3.1 Interpret the components of routing table
- 3.1.a Routing protocol code
- 3.1.b Prefix
- 3.1.c Network mask
- 3.1.d Next hop
- 3.1.e Administrative distance
- 3.1.f Metric
- 3.1.g Gateway of last resort

3.2 Determine how a router makes a forwarding decision by default
- 3.2.a Longest prefix match
- 3.2.b Administrative distance
- 3.2.c Routing protocol metric

3.3 Configure and verify IPv4 and IPv6 static routing
- 3.3.a Default route
- 3.3.b Network route

3.3.c Host route

3.3.d Floating static

3.4 Configure and verify single area OSPFv2

3.4.a Neighbor adjacencies

3.4.b Point-to-point

3.4.c Broadcast (DR/BDR selection)

3.4.d Router ID

3.5 Describe the purpose, functions, and concepts of first hop redundancy protocols

10% 4.0 IP Services

4.1 Configure and verify inside source NAT using static and pools

4.2 Configure and verify NTP operating in a client and server mode

4.3 Explain the role of DHCP and DNS within the network

4.4 Explain the function of SNMP in network operations

4.5 Describe the use of syslog features including facilities and levels

4.6 Configure and verify DHCP client and relay

4.7 Explain the forwarding per-hop behavior (PHB) for QoS, such as classification, marking, queuing, congestion, policing, and shaping

4.8 Configure network devices for remote access using SSH

4.9 Describe the capabilities and function of TFTP/FTP in the network

15% 5.0 Security Fundamentals

5.1 Define key security concepts (threats, vulnerabilities, exploits, and mitigation techniques)

5.2 Describe security program elements (user awareness, training, and physical access control)

5.3 Configure and verify device access control using local passwords

5.4 Describe security password policies elements, such as management, complexity, and password alternatives (multifactor authentication, certificates, and biometrics)

5.5 Describe IPsec remote access and site-to-site VPNs

5.6 Configure and verify access control lists

5.7 Configure and verify Layer 2 security features (DHCP snooping, dynamic ARP inspection, and port security)

5.8 Compare authentication, authorization, and accounting concepts

5.9 Describe wireless security protocols (WPA, WPA2, and WPA3)

5.10 Configure and verify WLAN within the GUI using WPA2 PSK

10% 6.0 Automation and Programmability

6.1 Explain how automation impacts network management

6.2 Compare traditional networks with controller-based networking

6.3 Describe controller-based, software defined architecture (overlay, underlay, and fabric)

6.3.a Separation of control plane and data plane

6.3.b Northbound and Southbound APIs

6.4 Compare traditional campus device management with Cisco DNA Center enabled device management

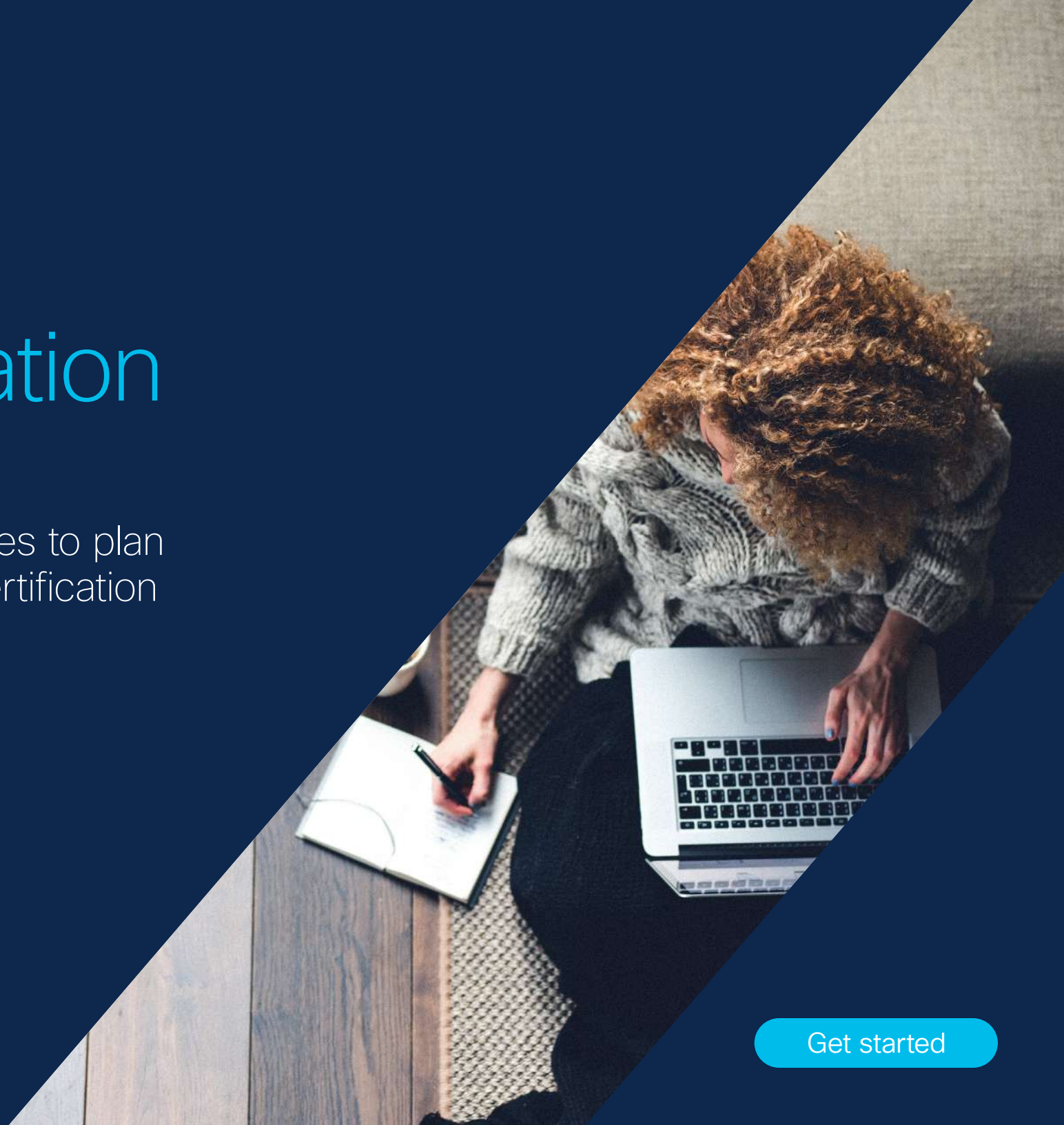
6.5 Describe characteristics of REST-based APIs (CRUD, HTTP verbs, and data encoding)

6.6 Recognize the capabilities of configuration management mechanisms Puppet, Chef, and Ansible

6.7 Recognize components of JSON-encoded data

CCNA Certification Guide

Top Cisco resources to plan and prepare for certification



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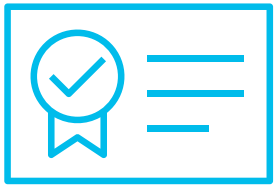
CCNA Overview

If you're looking to embark on a rewarding and lucrative information technology (IT) career, obtaining your Cisco Certified Networking Associate (CCNA) certification is a great place to start.

Earning your CCNA gives you a solid foundation for any field/role/specialty you want to pursue in IT. It covers the basics, from IP addressing to security and automation. A CCNA certification is the perfect start if you know you want to build or support IT infrastructure. You can specialize later.

A CCNA can help you prepare for a wide variety of IT jobs, including:

- Infrastructure Engineer
- Network Engineer
- IT Specialist
- Network Technician
- Network/Systems Administrator
- Business roles in IT organizations, from sales and marketing to the management track



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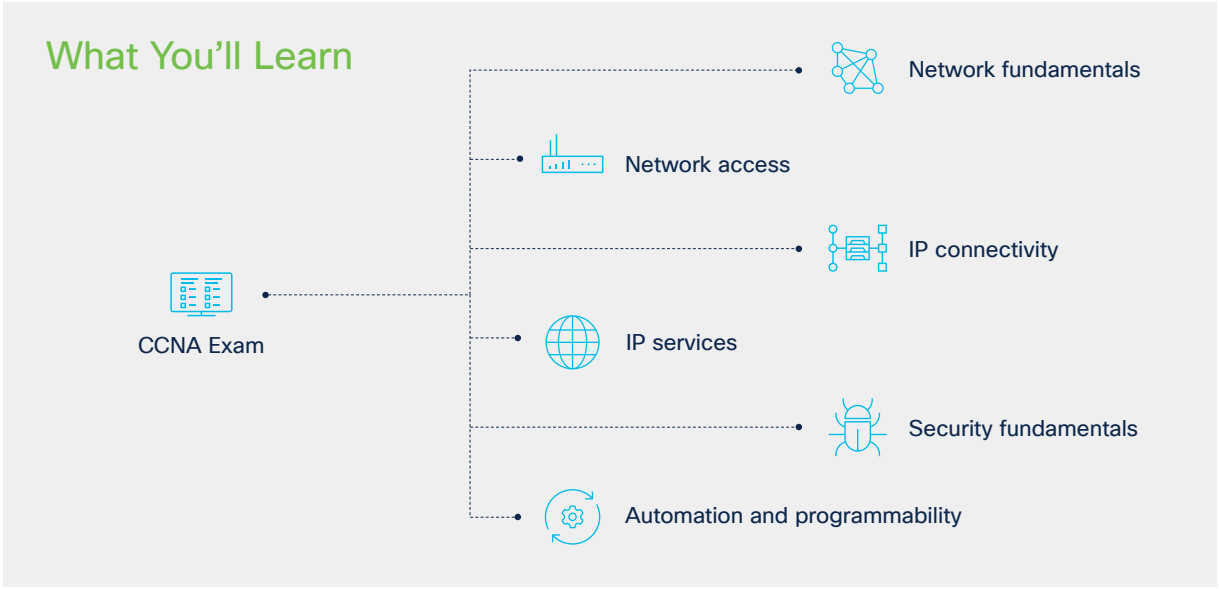
And while you build your skills, you're also building your income. Here's proof. Skillsoft's Global Knowledge 2021 IT Skills and Salary Report examined data from over 9,300 technology professionals, with 92 percent holding at least one certification. When surveyed, the most cited benefit of certification was also the top factor attributed to salary increases: an improvement in the quality of their work.

Training and certifications pay off – and organizations know it. Three out of four IT decision-makers worldwide reported a skills shortage in their department – a 145 percent increase since 2016. Even more, almost 50 percent believe that certifications close organizational skills gaps. That makes certified candidates stand out in a pool of applicants during the hiring process.

The network needs you. The field of IT is full of rewarding, meaningful, challenging work. Earning your CCNA certification can make your resume stand out and gets your foot in the door.

The CCNA arms you with a broad range of career skills. Get started today.



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Look ahead - Certification Tracks

As you can see, CCNA is one of many steps you can take on your learning journey. With each step, you build your knowledge base—and your reputation—and become increasingly valuable to any IT organization.

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Cisco certifications are available in multiple levels of expertise and various professional areas.

Earning the certification you need can lead you to the career you want. It can also keep you competitive in a field where 92 percent of IT professionals hold certifications (GK). Cisco's certification portfolio offers more options than ever before, empowering you to customize your learning path to meet your career needs, interests, and aspirations. Since every Cisco exam you pass earns you a certification, each of these milestones you reach tells a new chapter in your story. Here are the different Cisco certification levels you can earn:

Associate

Proof that you've mastered the essentials to build your IT career

Professional

Focus on a core technology track to sharpen your specialized expertise

Expert

The most prestigious certification you can obtain

Specialist

Enhance your networking knowledge in tech such as security, data center, or video

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Vocabulary

Knowing these key terms will help you on your CCNA journey.

Application Programming Interfaces (APIs) and REST APIs

APIs are published instructions to interface with a product or service. APIs enable developers to assemble a command or request for a service or data, to submit it, and to receive any output. They are published and maintained by the vendor.

Attack surface

A collection of all the possible paths a hacker or a malware application might follow to compromise protected data.

Authentication (Authentication, Authorization, and Accounting [AAA], Radius)

Authentication is how you control access to your network and prevent intrusions, data loss, and unauthorized users.

Continuous Integration/Continuous Development (CICD)

A CICD system provides automated builds and tests for creating software, making configuration changes, or completing other deployment tasks.

When using a CICD pipeline, coders can continually merge their changes to a main branch of an existing application, run integration tests on changes, keep changes small, and minimize the potential for problems due to multiple, gated test result requirements.

Data formats

(XML, JavaScript Object Notation [JSON], YAML Ain't Markup Language [YAML]) Common data formats that are both machine-readable and human-readable for providing input to programs and applications using interfaces (APIs).

DevOps

A combination of Development (Dev) and Operations (Ops), DevOps focuses on automation, regularly allowing failures that can be automatically fixed with mitigated risks, as well as connecting business outcomes to the availability goals for a given system. The DevOps movement makes developers responsible for deployment and also has teams use coding workflows and tools to manage infrastructure.

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DNS

The Domain Name Service (DNS) is like a phone book that translates IP addresses into human readable form. For example, www.facebook.com is 157.240.22.35 (IPv4), or 2001:558:feed::1.

Infrastructure, containers, and virtual machines

Infrastructure is a generic term for the underlying devices, physical or virtual, that provide computing power or storage capacity or networks, used to deliver software or applications. Virtual machines can emulate a computer system and are typically built as images, providing the same functionality as the physical computer. Containers package up software and dependencies into one descriptive file that contains everything to run an application, regardless of the underlying systems.

IP address (IPv4 and IPv6, classes, Open Systems Interconnection [OSI] and TCP/IP networking stack)

IP Addresses are like street addresses. Every service or server on the internet has a unique address where it can be accessed.

Malware analysis

The process of determining the functionality, origin, and potential impact of a given malware.

Network Address Translation (NAT)

IPv4 is limited to approximately 4 billion unique addresses. NAT is a scheme that allows a single address for a network (such as a small business) to be shared by all the users and devices on your network.

Network data models (YANG, RESTCONF, NETCONF)

YANG is a data modeling language for configuration and state data for network devices. It stands for Yet Another Next Generation. RESTCONF and NETCONF are protocols defined by a standards body, so that you can manage configuration of network devices modeled with YANG.

Packet

A unit of data that can be sent from one network endpoint to another. A packet has headers, footers, and a data payload, or some other information that it carries. The headers encode details about how to route the packet.

Python

A general-purpose, interpreted programming language. Python emphasizes code readability with whitespace requirements, so it is approachable and powerful. Many network automation applications and tutorials are centered around Python.

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Role-based access control

Access to data given to a person based on their job function or role.

Router

A router connects different networks together, providing a route between two computers (or servers) in different networks. Routers build the internet.

Routing protocols such as Border Gateway Protocol (BGP), Enhanced Interior Gateway Routing Protocol (EIGRP), and Open Shortest Path First (OSPF)

Routing protocols provide the overall map and directions for a packet to find the proper destination.

Security Incident and Event Management (SIEM)

An approach to security management that gathers data from multiple sources (such as syslog, device events, and error logs), processes the data (including correlation to identify potential threats), and raises an alert or ticket for further investigation if the threat is deemed to be real.

Security Orchestration and Automation Response (SOAR)

An approach that enables SOC teams to manage tickets raised through SIEM for threat response. SOAR enables automated workflows for responding to the threats.

Software Development Kit (SDK)

A platform for writing programs and applications targeting an API. It often includes documentation, configurations, and tools (such as compilers or linkers) to write and execute the code to interface with the API.

Subnet

Subnetting is a scheme for efficiently apportioning or assigning your IP addresses to systems in your organization.

Switch

A switch is a component that is used to build a network and to connect hosts and servers within a network. A switch cannot route packets or data between networks.

Threat intelligence

Evidence-based knowledge, including context, mechanisms, indicators, implications, and action-oriented advice about an existing or emerging hazard to assets.

Threat hunting

The process of proactively and iteratively searching through networks to detect and isolate advanced threats.

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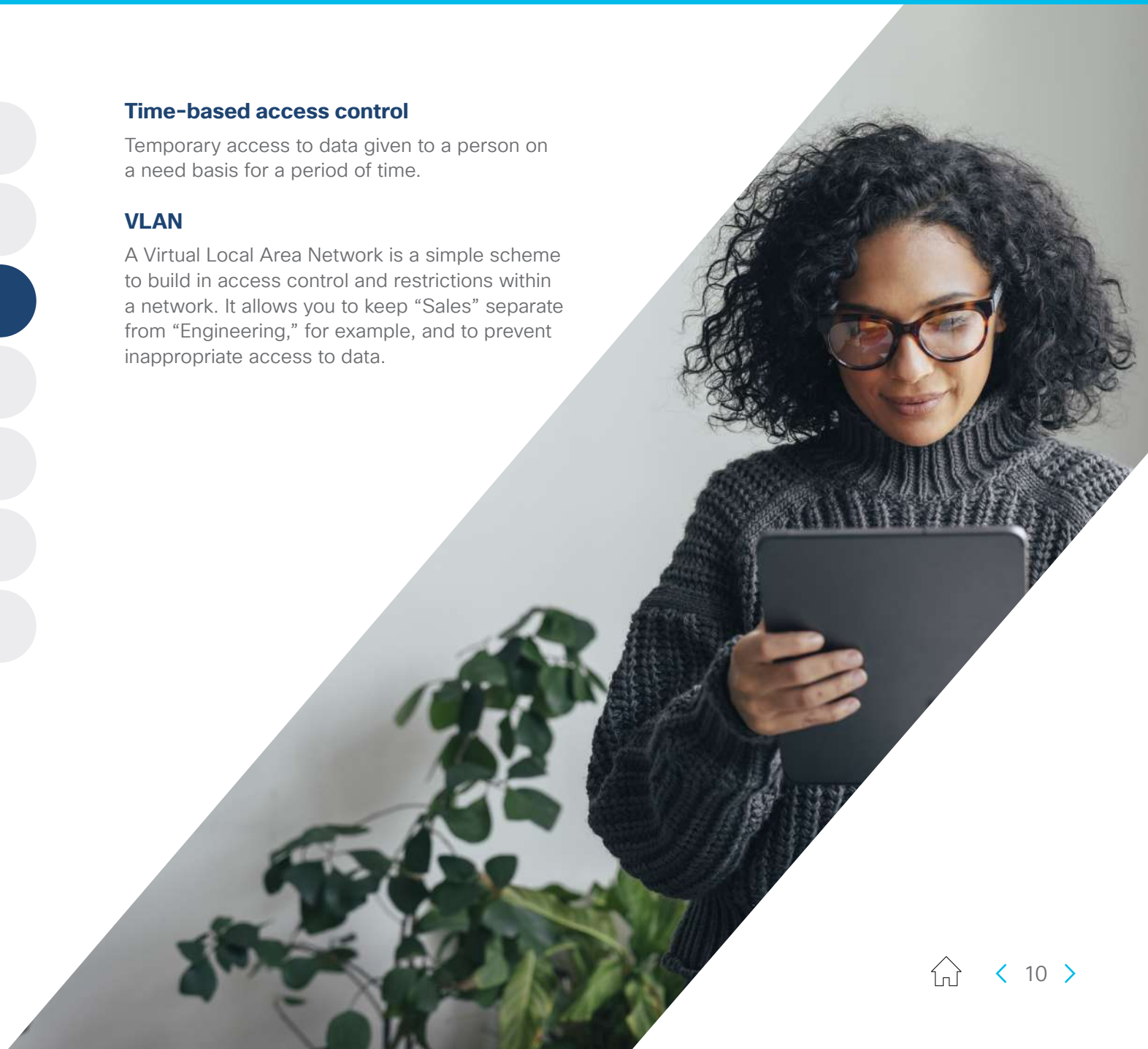
Time-based access control

Temporary access to data given to a person on a need basis for a period of time.

VLAN

A Virtual Local Area Network is a simple scheme to build in access control and restrictions within a network. It allows you to keep “Sales” separate from “Engineering,” for example, and to prevent inappropriate access to data.



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Training Options

This is where the real work happens. You'll need two things: the exam blueprint as well as a strategy for learning, studying, and practicing.

Keep this in mind: when the verb for a topic area is "describe," you won't need the same depth of knowledge for that topic as when the verbs are "configure," "troubleshoot," and "design."

There are several training options to help you prepare:

- Cisco Guided Study Groups offer you a 180-day journey of certification preparation. This approach offers a best-of-all-worlds path toward certification, with the flexibility and convenience of e-learning plus the motivation and accountability of working with a live coach.
- Use the Cisco Learning Locator to find instructor-led courses-both in-person and virtual.
- If books are your thing, check out the Cisco Press CCNA 200-301 Official Cert Guide, a perfect addition to your self-study plan.
- Browse available self-paced e-learning courses from the Cisco Learning Network Store.
- The CCNA Preparation Bundle helps you prepare for the 200-301 Cisco Certified Network Associate (CCNA) exam. For a limited time, save 16 percent off the bundle price.

Regardless of how you prepare for the exam, it's crucial to get your hands on the gear to practice. This is called "labbing," as in "practicing in a lab environment." Your ability to execute critical tasks will be tested on the exam, so you need to practice. Lab early. Lab often. Then lab some more.

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Exam Overview

CCNA certification exams are administered by our testing partner, Pearson VUE, as proctored exams. When you take the exam, you'll be in a controlled environment to ensure fairness and to give you the best, most consistent experience.

The CCNA exam is the basis for the certification exam. It defines the contents of both the exam and the official training course, and it should be your roadmap for studying. If you can successfully complete the tasks defined for each topic, you're ready for the exam.

And now you can take certification exams online, so you can stay on track, even when you can't travel to a testing center.

Visit www.cisco.com/go/onlinetesting to perform a system check.

During the exam, it will be just you, your knowledge, and experience against the test. Keep track of the time, read each question carefully, answer each one (and if you don't know the answer, try to eliminate one or more options and then guess), and keep moving to the end.

To view a walk-through demonstration of the various exam question types and how they function, check out the Cisco Certification Exam Tutorial Videos page.

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CCNA Essentials

Still thinking about getting certified? Click CCNA Essentials for more details about the program. It will help you make the best decision.

CCNA Prep

Already decided to get certified, and want to start studying? Click CCNA Prep to find the ultimate resources to develop your self-study plan.

We have many resources to help your progress. We encourage you to sign up for the Cisco Learning Network to be able to access learning resources, including videos, learning maps and more. Just as an example the CCNA Training Video learning map has over 52 hours of self-study preparation tools and content.

Other CCNA resources include:

CCNA Certification

Download 200-301 CCNA Exam: Cisco Certified Network Associate Exam Topics

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These are exciting times to be working in technology. The IT landscape evolves daily, but through it all, knowledge of routing and switching remain the core foundation on which you can build your career.

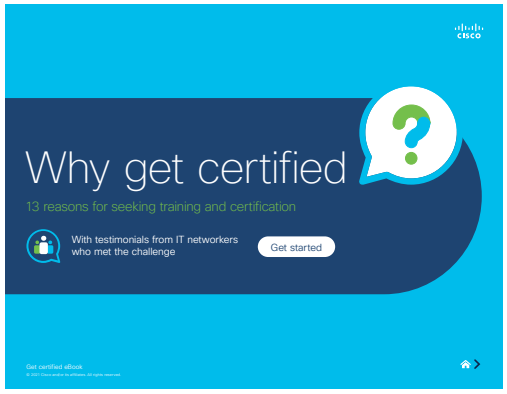
So many vibrant technological developments culminating all at once can seem overwhelming. You need to be able to catch the wave of change and ride it smoothly. This is precisely why we believe right now is the best time to explore how training and certification can keep you focused and help make you a technical superstar in your organization.

Earning a CCNA is the gateway to a rewarding and lucrative IT career. With your CCNA, you'll be more knowledgeable and confident about all things IT.

Use this email template to let your manager know why training and certification is so beneficial for you—and for them. Get the help you need to transform your career, your income, and your skill set.

But beyond that, training and certification can transform your life. By learning the latest methods and skills in IT, you'll gain the self-confidence that comes from setting goals, then accomplishing them. And that self-confidence will continue to empower your career.

Ask your manager to sponsor your training. Once they understand the benefits to your organization, they will be eager to learn more and support you with next steps.



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