



Welcome to Network For You

Introduction to New CCNP Enterprise

Introduction to New CCNP Enterprise:



- Now to Get CCNP we need to write 2 exams.
- Core Exam is must and plus an optional exam (Like ENARSI or ENSDWI etc.)

350-401 ENCOR	Implementing and Operating Cisco Enterprise Network Core Technologies (ENCOR)
300-410 ENARSI	Implementing Cisco Enterprise Advanced Routing and Services (ENARSI)
300-415 ENSDWI	Implementing Cisco SD-WAN Solutions (ENSDWI)
300-420 ENSLD	Designing Cisco Enterprise Networks (ENSLD)
300-425 ENWLSD	Designing Cisco Enterprise Wireless Networks (ENWLSD)
300-430 ENWLSI	Implementing Cisco Enterprise Wireless Networks (ENWLSI)
300-435 ENAUTO	Cisco Enterprise Solutions (ENAUTO)



In our Course we are going to do as follow:

- **350-401 ENCOR Implementing and Operating Cisco Enterprise Network Core Technologies (ENCOR)**
- **300-410 ENARSI Implementing Cisco Enterprise Advanced Routing and Services (ENARSI)**

Implementing Cisco Enterprise Network Core Technologies v1.0 (350-401)

Exam Description: Implementing Cisco Enterprise Network Core Technologies v1.0 (ENCOR 350-401) is a **120-minute** exam associated with the CCNP and CCIE Enterprise Certifications.

This exam tests a candidate's knowledge of implementing core enterprise network technologies including dual stack (IPv4 and IPv6) architecture, virtualization, infrastructure, network assurance, security and automation.

The course, Implementing Cisco Enterprise Network Core Technologies, helps candidates to 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.



15% 1.0 Architecture

1.1 Explain the different design principles used in an enterprise network

1.1.a Enterprise network design such as Tier 2, Tier 3, and Fabric Capacity planning

1.1.b High availability techniques such as redundancy, FHRP, and SSO

1.2 Analyze design principles of a WLAN deployment 1.2.a Wireless deployment models (centralized, distributed, controller-less, controller based, cloud, remote branch)

1.2.b Location services in a WLAN design

1.3 Differentiate between on-premises and cloud infrastructure deployments

1.4 Explain the working principles of the Cisco SD-WAN solution

1.4.a SD-WAN control and data planes elements

1.4.b Traditional WAN and SD-WAN solutions

1.5 Explain the working principles of the Cisco SD-Access solution

1.5.a SD-Access control and data planes elements

1.5.b Traditional campus interoperating with SD-Access



1.6 Describe concepts of wired and wireless QoS

1.6.a QoS components

1.6.b QoS policy

1.7 Differentiate hardware and software switching mechanisms

1.7.a Process and CEF

1.7.b MAC address table and TCAM

1.7.c FIB vs. RIB

10% 2.0 Virtualization

2.1 Describe device virtualization technologies

2.1.a Hypervisor type 1 and 2

2.1.b Virtual machine

2.1.c Virtual switching

2.2 Configure and verify data path virtualization technologies

2.2.a VRF

2.2.b GRE and IPsec tunneling

2.3 Describe network virtualization concepts

2.3.a LISP

2.3.b VXLAN



30% 3.0 Infrastructure

3.1 Layer 2

3.1.a Troubleshoot static and dynamic 802.1q trunking protocols

3.1.b Troubleshoot static and dynamic EtherChannels

3.1.c Configure and verify common Spanning Tree Protocols (RSTP and MST)

3.2 Layer 3

3.2.a Compare routing concepts of EIGRP and OSPF (advanced distance vector vs. linked state, load balancing, path selection, path operations, metrics)

3.2.b Configure and verify simple OSPF environments, including multiple normal areas, summarization, and filtering (neighbor adjacency, point-to-point and broadcast network types, and passive interface)

3.2.c Configure and verify eBGP between directly connected neighbors (best path selection algorithm and neighbor relationships)

3.3 Wireless

3.3.a Describe Layer 1 concepts, such as RF power, RSSI, SNR, interference noise, band and channels, and wireless client devices capabilities

3.3.b Describe AP modes and antenna types

3.3.c Describe access point discovery and join process (discovery algorithms, WLC selection process)

3.3.d Describe the main principles and use cases for Layer 2 and Layer 3 roaming

3.3.e Troubleshoot WLAN configuration and wireless client connectivity issues



3.4 IP Services

3.4.a Describe Network Time Protocol (NTP)

3.4.b Configure and verify NAT/PAT

3.4.c Configure first hop redundancy protocols, such as HSRP and VRRP

3.4.d Describe multicast protocols, such as PIM and IGMP v2/v3

10% 4.0 Network Assurance

4.1 Diagnose network problems using tools such as debugs, conditional debugs, trace route, ping, SNMP, and syslog

4.2 Configure and verify device monitoring using syslog for remote logging

4.3 Configure and verify NetFlow and Flexible NetFlow

4.4 Configure and verify SPAN/RSPAN/ERSPAN

4.5 Configure and verify IPSLA

4.6 Describe Cisco DNA Center workflows to apply network configuration, monitoring, and management

4.7 Configure and verify NETCONF and RESTCONF

20% 5.0 Security

5.1 Configure and verify device access control

5.1.a Lines and password protection

5.1.b Authentication and authorization using AAA



5.2 Configure and verify infrastructure security features

5.2.a ACLs

5.2.b CoPP

5.3 Describe REST API security

5.4 Configure and verify wireless security features

5.4.a EAP

5.4.b WebAuth

5.4.c PSK

5.5 Describe the components of network security design

5.5.a Threat defense

5.5.b Endpoint security

5.5.c Next-generation firewall

5.5.d TrustSec, MACsec

5.5.e Network access control with 802.1X, MAB, and WebAuth



15% 6.0 Automation

6.1 Interpret basic Python components and scripts

6.2 Construct valid JSON encoded file

6.3 Describe the high-level principles and benefits of a data modeling language, such as YANG

6.4 Describe APIs for Cisco DNA Center and vManage

6.5 Interpret REST API response codes and results in payload using Cisco DNA Center and RESTCONF

6.6 Construct EEM applet to automate configuration, troubleshooting, or data collection

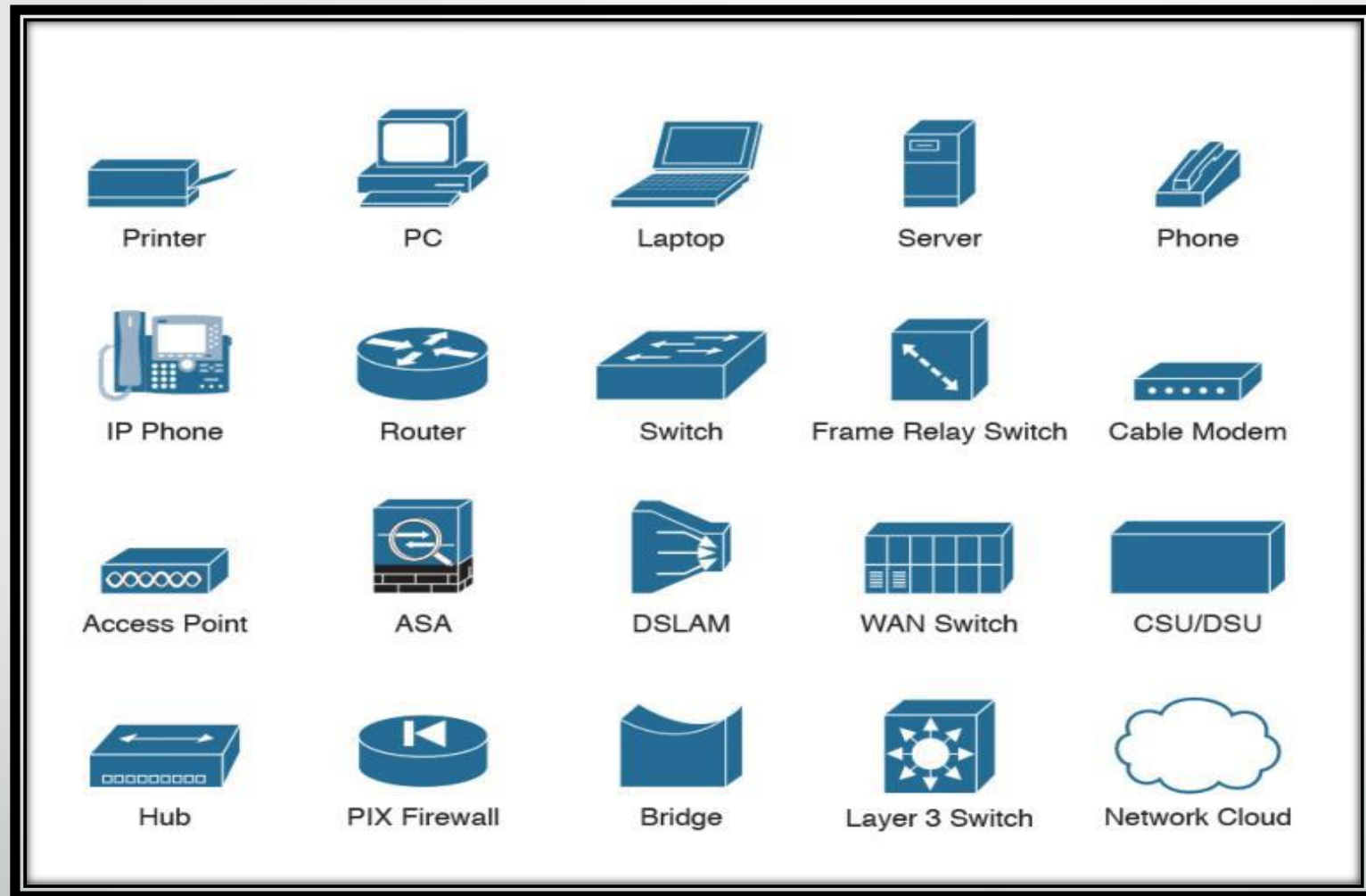
6.7 Compare agent vs. agentless orchestration tools, such as Chef, Puppet, Ansible, and SaltStack

Requirements

A basic understanding of networking (CCNA level).



Icons Used for this Course





Basics of Networking:

What is a network?

A network is a collection of devices and end systems connected to each other and able to communicate with each other. These could be computers, servers, smartphones, routers etc.

A network could be as large as the internet or as small as your two computers at home like sharing files and a printer.

When the devices which are connected together share data and resources is known as network.

Some of the components that make up a network:

Personal Computers (PC): These are the endpoint of your network, sending and receiving data.

Network Cards: they translate data from your computer in a readable format for the network.

it is also known as NIC (Network interface card).



Some Command Prompt for CCNA :

- ping :- packet internet gopher it uses icmp (internet control message protocol) protocol
For verification the other device is reachable to me or not ??
- ipconfig :- to check the IP address of a computer
- ipconfig /all :- to check the IP address + mac address
- getmac :- to check the mac address of a computer
- arp -a :- to check arp table
- arp -d :- to delete arp table (run as administrator)
- To check public IP

Visit: - www.whatismyipaddress.com to check your public IP or type in google what is my IP we will get.



CISCO Router:

- Router is a device work on Layer 3 or Network layer of OSI Model.
- Router is use to make communication between two or more different network.
- Router is use to connect LAN network with WAN.
- Router is a device which select best path on the basis of routing protocol.
- Router perform routing that is static or dynamic and also other various function such as NAT, ACL and Intervlan routing etc.
- Router is a device which makes communication between two or more different network.
- Routers interconnect different networks or in simple way we can say switch is use to connect devices with a network whereas router is use to connect different networks.
- It works on Layer 3 (Network Layer).



<https://t.me/learningnets>

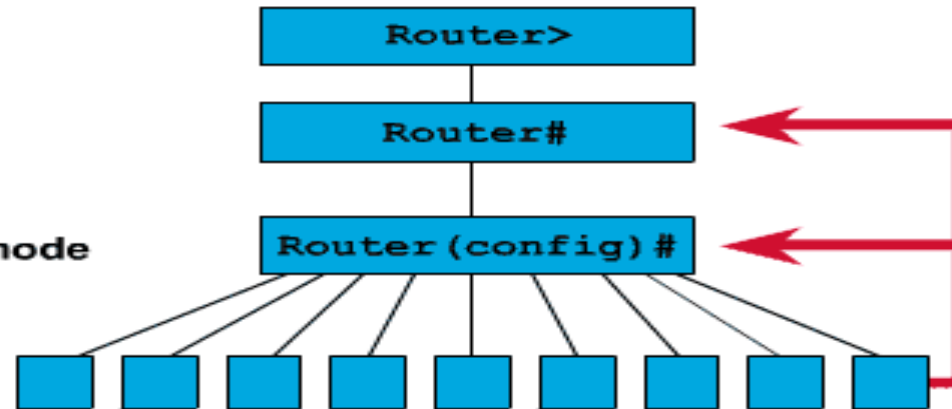




Router Modes:

Overview of Router Modes

- ◆ User Exec mode
- ◆ Privileged Exec mode
- ◆ Global configuration mode
- ◆ Specific Configuration modes



Configuration Mode	Prompt
Interface	<code>Router (config-if) #</code>
Subinterface	<code>Router (config-subif) #</code>
Controller	<code>Router (config-controller) #</code>
Map-list	<code>Router (config-map-list) #</code>
Map-class	<code>Router (config-map-class) #</code>
Line	<code>Router (config-line) #</code>
Router	<code>Router (config-router) #</code>
IPX-router	<code>Router (config-ipx-router) #</code>
Route-map	<code>Router (config-route-map) #</code>



User Mode (Default Mode): In this mode we can do some basic monitoring.

Router>

We can run some cmds such as ping, telnet, Ver etc.

Privileged Mode: In this mode we can do monitoring and some troubleshooting.

Router#

We can run some cmds such as clock, ping, Telnet, Save, Show, history etc.

Global Configuration Mode: In this mode we can do All configuration that effect the router globally.

Router(config)#

Interface Mode: In this Mode configurations done on the specific interface.

Router(config)#int fo/o

Look like this when we are in Int mode.

Router(config-if)#

Router(config-if)#ip add 10.1.1.1 255.0.0.0

Router(config-if)# no sh

Rommon Mode: We use this mode Generally when we want password recovery.

How to go in Rommon mode?

Power ON router and press Ctrl+Break

Then you will enter in Rommon mode.



CISCO Operating Systems:

IOS (Internetwork Operating System):

- IOS is an Operating System used on CISCO Devices, such as router and switches.
- CISCO IOS is a family of Software.
- To Configure a CISCO device running IOS, the Command-Line Interface (CLI) is used.
- The CLI is usually accessed from local or remote device running Telnet or SSH.
- The CLI comes with predefined number of commands to configure routing and switching.
- The IOS is usually stored as a system image within a router or switch flash memory.

```
...
R1#
R1#sh ver
Cisco IOS Software, 3600 Software (C3640-JK9S-M), Version 12.4(16), RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2007 by Cisco Systems, Inc.
Compiled Wed 20-Jun-07 11:43 by prod_rel_team

ROM: ROMMON Emulation Microcode
ROM: 3600 Software (C3640-JK9S-M), Version 12.4(16), RELEASE SOFTWARE (fc1)

R1 uptime is 0 minutes
System returned to ROM by unknown reload cause - suspect boot_data[BOOT_COUNT] 0x0, BOOT_COUNT 0,
BOOTDATA 19
```



Basic Commands:

User mode:

Router> enable

Privilege mode:

Router# show running-config

Router# show startup-config

Router# show flash

Router# show version

Router# show ip int br



CISCO Switch:

- Switch is a device used to connect multiple systems in LAN.
 - Switch is a device used to connect same network where are Router is a device used to connect two or more different Network.
 - We have type of Switch that is Manageable and Unmanageable Switch.
 - In Manageable Switch we can assign IP address and Create Vlan we can do operation and it have Console port.
 - Un Manageable Switch In this type of switch we cannot assign IP address and it is not having Console Port.
 - We have two type of switch that is Layer 2 and Layer 3.
 - Switches which operate at Network Layer 3 called Layer 3 or Multilayer Switches.
 - Switches which operate at Data Link Layer of OSI Model it is called Layer 2 Switches.
 - As we know without switch we cannot connect Multiple device so we can say switch is very important device in networking to connect Multiple devices in a network.
 - As we know we can Managed switch locally or remotely?
- If you want to connect to Switch Remotely then we will use SSH or Telnet to connect switch via remotely.



In this course we are going to use the following software as given below:

Packet Tracer.

GNS3.

EVE ng.

Packet Tracer:

Packet Tracer is a cross-platform visual simulation tool designed by Cisco Systems that allows users to create network topologies and imitate modern computer networks. The software allows users to simulate the configuration of Cisco routers and switches using a simulated command line interface.

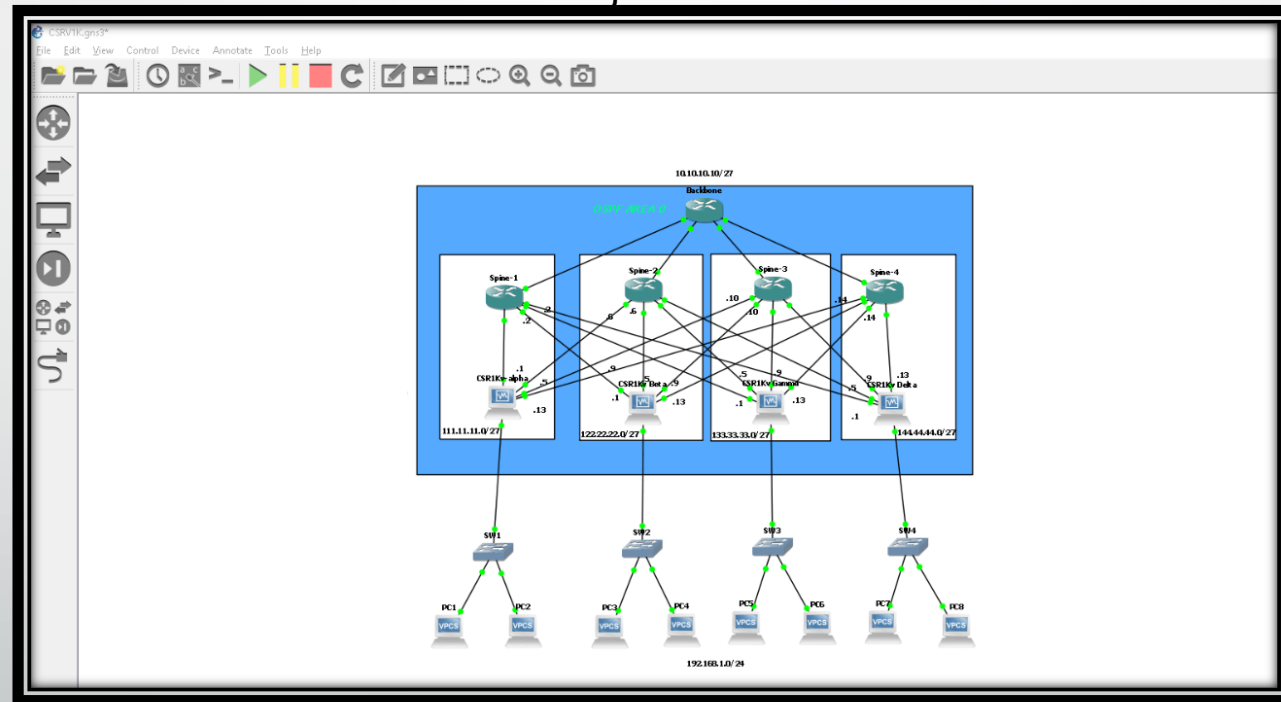
The banner features the Cisco Networking Academy logo at the top left. The main title 'Cisco Packet Tracer' is centered, with a subtitle 'An innovative and powerful networking simulation tool used for practice, discovery and troubleshooting'. Below this is a horizontal strip of six images: a group of students, a person at a computer, a person in a lab, a person at a computer, a person at a computer, and a person at a computer. Below the strip are six colored boxes with text: 'Courses in 20+ Languages' (blue), 'Hands-On' (teal), 'Flexible Delivery' (light blue), 'Supports Personalized Instruction' (green), 'Simulations' (orange), and 'Hackathons' (red). At the bottom left, it says 'Integral to the Skills-to-Jobs Learning Experience'. At the bottom center, it says '© Copyright Cisco 2020'. On the right side, there is a large blue brain icon connected to a green plug, and a yellow lightbulb icon with a blue base.



GNS3:-

Graphical Network Simulator-3 is a network software emulator first released in 2008. It allows the combination of virtual and real devices, used to simulate complex networks. GNS3 is used by many large companies including Exxon, Walmart, AT&T and NASA, and is also popular for preparation of network professional certification exams. We need to register gns3 site and download this as link is given below.

<https://www.gns3.com>





EVE-NG (Emulated Virtual Environment Next Generation):

EVE-NG (Emulated Virtual Environment Next Generation) is a multi-vendor virtual network simulator that, similar to VIRL Personal Edition,

Was developed for individuals and smaller businesses.

They offer a free Community Edition as well as a Professional Edition for \$110.75 per year.

