

Chapters 27 – 29: Virtualization, Automation, and Programmability Exam (Answers)

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CCNPv8 ENCOR (Version 8.0) – Virtualization, Automation, and Programmability Exam

How to find: Press “Ctrl + F” in the browser and fill in whatever wording is in the question to find that question/answer. If the question is not here, find it in **Questions Bank**.

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1. Which term defines a software emulation of a physical server with an operating system?

- Guest OS
- container image
- container
- **virtual machine**

Explanation: A virtual machine is a software emulation of a physical server including a CPU, memory, network interface, and operating system.

2. What component enables VMs within a virtualized server environment to communicate with each other and with external networks?

- guest OS
- container engine
- **vSwitch**
- hypervisor

Explanation: In a virtualized server the vSwitch is connected to external networks through physical NICs (pNICs) and to VMs through virtual NICs (vNICs).

3. What are three responsibilities of the the NFV virtualized infrastructure manager? (Choose three.)

- performing all FCAPS functions for VNFs

- **managing and controlling NFVI hardware resources**
- **performing life cycle management of all NFVI resources**
- creating, maintaining, and tearing down VNF network services
- creating an end-to-end network
- **collecting performance measurements and fault information**

Explanation: Within the ETSI NFV architectural framework, it is the virtualized infrastructure manager that is responsible for managing and controlling the NFVI hardware resources of compute, storage, and network, and the virtualized resources.

4. Which two components of the ETSI NFV architectural framework make up the NFV management and orchestration (MANO)? (Choose two.)

- Virtualized Infrastructure Manager
- NFV infrastructure
- **NFV element manager**
- OSS/BSS
- **NFV orchestrator**

Explanation: In the ETSI NFV architectural framework the NFV orchestrator and VNF manager together are known as NFV management and orchestration (MANO).

5. In an Open vSwitch (OVS) architecture, which component resides in the kernel space and forwards packets from the network stack to the vNIC of the VM?

- emulated PCIe device
- **vSwitch**
- pNIC driver
- pNIC

Explanation: The vSwitch is responsible for moving data from the network stack and sending it to the vNIC of the VM.

6. What term is used to define the software process that creates VMs and performs hardware abstraction to support VMs?

- **hypervisor**
- Virtualized Infrastructure Manager (VIM)
- container
- element manager

Explanation: The hypervisor is virtualization software that performs hardware abstraction. It allows multiple VMs to run concurrently in the virtual environment.

7. What function does Cisco DNA Center provide as part of a Cisco enterprise NFV solution?

- VNF life cycle management, monitoring, device programmability, and hardware acceleration
- communication between different VNFs and to the outside world
- CPU, memory, and storage resources to run VNFs and applications
- **VNF management and orchestration**

Explanation: The Cisco DNA Center provides the VNF management and orchestration (MANO) functionality to the Cisco Enterprise NFV solution.

8. Question as presented: Match each VNF term to its description.

interrupt request (IRQ)

kernel

I/O device

direct memory access (DMA)

peripheral device

I/O device

hardware signal sent to the CPU by an I/O device

interrupt request (IRQ)

memory access method

direct memory access (DMA)

core part of an operating system

kernel

- peripheral device
- hardware signal sent to the CPU by an I/O device
- memory access method
- core part of an operating system

9. What is a limitation when PCI Passthrough is deployed?

- CPU utilization is increased.
- **VNFs cannot share pNICs.**
- Traffic between VNFs must be switched by an external switch.
- A dedicated CPU core is required to poll pNICs and process incoming data.

Explanation: PCI Passthrough was developed to increase packet throughput in an OVS environment. However, the downside to PCI Passthrough is that each pNIC is dedicated to a single VNF.

10. What is the function provided by the OSS/BSS components of the ETSI NFV architectural framework?

- They collect performance measurements and fault information.
- **They support network systems and services that run business operations.**
- They perform all FCAPS functions for VNFs.
- They perform life cycle management of all NFVI resources.

Explanation: In the ETSI NFV architectural framework, the operations support system (OSS) supports network systems and services while the business support system (BSS) runs business operations.

11. Which two HTTP functions correspond to the UPDATE function in CRUD? (Choose two.)

- **PUT**
- DELETE
- **PATCH**
- GET
- POST

Explanation: CRUD is an acronym that stands for CREATE, READ, UPDATE, and DELETE. The HTTP functions that correspond to CRUD functions are as follows:

GET -> READ

POST -> CREATE

PUT/PATCH -> UPDATE

DELETE -> DELETE

12. What are two syntax rules for writing a JSON array? (Choose two.)

- A semicolon separates the key and list of values.
- A space must separate each value in the array.
- The array can include only one value type.
- **Values are enclosed in square brackets.**
- **Each value in the array is separated by a comma.**

Explanation: A JSON array is a collection of ordered values within square brackets []. The values in the array are separated by a comma. For example “users” : [“bob”, “alice”, “eve”].

13. Refer to the exhibit. Which data format is used to represent the data for network automation applications?

- YAML
- **XML**
- JSON
- HTML

```
<message>complete</message>
<username>efriends</username>
<user_info>
  <First_name>Emily</First_name>
  <Last_name>Friends</Last_name>
</user_info>
```

Explanation: Common data formats that are used in many applications including network automation and programmability include these:

JavaScript Object Notation (JSON) – In JSON, the data known as an object is one or more key/value pairs enclosed in braces { }. Keys must be strings within double quotation marks “. Keys and values are separated by a colon.

eXtensible Markup Language (XML) – In XML, the data is enclosed within a related set of tags data.

YAML Ain’t Markup Language (YAML) – In YAML, the data known as an object is one or more key value pairs. Key value pairs are separated by a colon without the use of quotation marks. YAML uses indentation to define its structure, without the use of brackets or commas.

14. Which API does the Cisco DNA Center controller use for user authentication?

- Fabric Device
- Network Device
- Authentication
- **Token**

Explanation: The HTTP POST function is used to send the credentials to the Cisco DNA Center controller. The Cisco DNA Center uses basic authentication to pass a username and password to the Cisco DNA Center Token API to authenticate users.

15. Refer to the exhibit. What is the meaning of the config false statement under the observed-speed leaf node?

```

list interface {
    key "name";
    leaf name {
        type string;
    }
    leaf speed {
        type enumeration {
            enum 10m;
            enum 100m;
            enum auto;
        }
    }
    leaf observed-speed {
        type uint32;
        config false;
    }
}

```

- The value of the leaf node is a comment string.
- The value of the leaf node is the default value.
- **The value of the leaf node cannot be configured.**
- The value of the leaf node has not been configured yet.

Explanation: The leaf named observed-speed cannot be configured due to the config false command. The speeds in this leaf are auto-detected (observed); hence, it is not a configurable leaf.

16. Which statement describes the function of GitHub?

- It is an online game site.
- It is a service provider for virtualized servers and applications.
- **It is a hosted web-based repository for code.**
- It is an online storage service for personal files.

Explanation: GitHub is a hosted web-based repository for code. It has capabilities for bug tracking, version control, and task management. Using GitHub is one of the easiest ways to track changes in program files, collaborate with other developers, and share code with the online community.

17. Which type of API is used to carry configuration changes from a network controller to individual network devices in network automation applications?

- lower layer
- **southbound**

- eastbound
- northbound

Explanation: In network automation applications, when a network operator makes a change to the configuration of a network device in the management software of the controller, those changes are pushed down to the individual devices by using a southbound API. These devices can be routers, switches, or even wireless access points.

18. Refer to the exhibit. Which data format is used to represent the data for network automation applications?

- YAML
- JSON
- HTML
- XML

```
message: success
username: tfrank2
user_info:
  First_name: Tom
  Last_name: Frank
```

Explanation: Common data formats that are used in many applications including network automation and programmability include these:

- **JavaScript Object Notation (JSON)** – In JSON, the data known as an object is one or more key/value pairs enclosed in braces { }. Keys must be strings within double quotation marks " ". Keys and values are separated by a colon.
- **eXtensible Markup Language (XML)** – In XML, the data is enclosed within a related set of tags

data

- **YAML Ain't Markup Language (YAML)** – In YAML, the data known as an object is one or more key value pairs. Key value pairs are separated by a colon without the use of quotation marks. YAML uses indentation to define its structure, without the use of brackets or commas.

19. A network administrator is checking and making configuration changes on a network device from home. What are two ways to secure the connection between the command-line interface (CLI) of the network device and the remote workstation used by the administrator? (Choose two.)

- through a Telnet connection
- **through an SSH connection**
- through a virtual terminal application
- through an HTTP interface
- **through a VPN connection**

Explanation: The connection between a remote workstation and a network device in a company location can be secured by establishing an SSH or VPN connection first, because both solutions provide encrypted data transmission.

20. What is the characteristic of the Postman application that relates to using APIs?

- It provides a GUI to interact with remote workstations.
- It is a web-based application to connect to various network devices.
- It is a web-based email client.
- **It uses a console-based approach to interact with APIs.**

Explanation: Postman is an application that makes it possible to interact with APIs using a console-based approach. Postman allows for the use of various data types and formats to interact with REST-based APIs.

21. The following program was created in Python.

```
user_input = int( input(" What is 3 * 2? "))

if (user_input = 6):

print (" Correct!")

else: print (" Incorrect...")
```

Why does the program result in an error?

- **There should be double equal signs when checking conditional equality.**
- The quotation mark is not needed in the print function.
- $3 * 2$ does not equal 6.
- The user_input variable was not defined.

Explanation: A single equal sign is used to assign a variable. This program should use double equal signs to check equality.

22. In a hosted Chef type of deployment, where is the Chef server located?

- on a LAN located near to the other chef components
- **in the cloud**
- on a workstation
- in the enterprise core

Explanation: There are several types of deployment models for the Chef server.

Chef Solo: The Chef server is hosted locally on the workstation. **Chef client and server:** This is a typical Chef deployment with distributed components.

Hosted Chef: The Chef server is hosted in the cloud.

Private Chef: All Chef components are within the same enterprise network.

23. Which term is used to describe a set of instructions for execution by the configuration management tool Puppet?

- **Manifest**
- Playbook
- Cookbook
- Pillar

Explanation: The configuration management tool Puppet uses the name Manifest to describe the set of instructions to be executed.

24. Question as presented: Match the automation tool with the description.

Embedded Event Manager	configuration management tool written in Ruby
Ansible	configuration management tool built on Python
Chef	software component of the Cisco IOS that automates tasks
SaltStack	automation tool that uses playbooks written in YAML

- configuration management tool written in Ruby
- configuration management tool built on Python
- software component of the Cisco IOS that automates tasks
- automation tool that uses playbooks written in YAML

25. What is the SaltStack agent called that runs on nodes?

- station
- reactor
- **minion**
- chef

Explanation: The SaltStack agent that runs on nodes is called a minion. SaltStack grains run on the minions to gather information and report back to the SaltStack master.

26. A student is studying in preparation for an interview for a job in programming and network automation. What is a characteristic of Ansible ?

- **It is an agentless automation tool.**
- It is a programming interface that communicates from a network controller to its management software.
- It is a hosted web-based repository that uses version control for storing and sharing code.
- It is a free online tool that can check the format of programmed files to verify that they have valid syntax.

27. Which statement describes the Cisco Embedded Event Manager?

- It is a security policy management platform that provides highly secure network access control (NAC) to users and devices.
- It is a centralized management platform that aggregates and correlates threat events.
- It is a collector and aggregator of network telemetry data that performs network security analysis and monitoring.
- **It is a Cisco IOS tool that allows engineers to build task automation software applets.**

Explanation: The Cisco Embedded Event Manager (EEM) is a Cisco IOS tool that uses software applets to automate tasks on a Cisco device. EEM is completely contained within the local device and needs no external scripting or monitoring device.

28. Which configuration management tool uses an agentless approach?

- **Ansible**
- Chef
- SaltStack
- Puppet

Explanation: Ansible uses an agentless approach. Chef, Puppet, and SaltStack are agent-based.

29. Question as presented: Match the Ansible Playbook structure component to the use case.

playbook

play

task

issues show commands to retrieve output

task

applies policies or configurations to a group of hosts

play

enforces configuration and/or deployment steps

playbook

- issues show commands to retrieve output
- applies policies or configurations to a group of hosts
- enforces configuration and/or deployment steps

30. In which type of deployment is the Chef server hosted in the cloud?

- private Chef
- **hosted Chef**
- Chef Solo
- Chef Client and Server

Explanation: There are several types of deployment models for the Chef server.

Chef Solo: The Chef server is hosted locally on the workstation.

Chef Client and Server: This is a typical Chef deployment with distributed components.

Hosted Chef: The Chef server is hosted in the cloud.

Private Chef: All Chef components are within the same enterprise network.

31. What is a characteristic of the Cisco Embedded Event Manager?

- It uses playbooks written in YAML to deploy configuration changes.

- **It is a software component of the Cisco IOS.**
- It is built on Python and has a Python programming interface.
- It is an open source tool based on the Ruby language.

Explanation: The Cisco Embedded Event Manager (EEM) is a Cisco IOS tool that uses software applets to automate tasks on a Cisco device. EEM is completely contained within the local device and needs no external scripting or monitoring device.

32. Which language is used to write Ansible playbooks?

- YANG
- **YAML**
- Python
- JSON

Explanation: Ansible playbooks are written in YAML, which uses dictionaries similar to JSON in the use of key/value pairs.

33. A student is studying in preparation for an interview for a job in programming and network automation. What is a characteristic of Chef?

- It is a free online tool that can check the format of programmed files to verify that they have valid syntax.
- It is a hosted web-based repository that uses version control for storing and sharing code.
- **It is an open source configuration management tool that is designed to automate configurations and operations of a network and server environment.**
- It is a markup programming language.

34. A student is studying in preparation for an interview for a job in programming and network automation. What is a characteristic of GitHub ?

- It is an application that can interact with APIs using a console-based approach and allows various data types and formats to interact with REST-based APIs.
- **It is a hosted web-based repository that uses version control for storing and sharing code.**
- It is an acronym that describes functions that most applications or databases use to store or alter data.
- It is a data format that stores all of its information in key/value pairs and surrounds each object with curly braces.

35. A student is studying in preparation for an interview for a job in programming and network automation. What is a characteristic of CRUD ?

- It is a data model that describes what can be configured, monitored, executed, and reset on a device.
- It is a markup programming language.
- It is a free online tool that can check the format of programmed files to verify that they have valid syntax.
- **It is an acronym that describes functions that most applications or databases use to store or alter data.**

Explanation: CRUD is an acronym that stands for CREATE, READ, UPDATE, and DELETE. For example, in a SQL database, the CRUD functions are used to interact with or manipulate the data stored in the database.

36. What is a characteristic of a virtual machine?

- It is lightweight and small in size.
- It leverages the kernel of the host OS for fast load times.
- **It is equipped with a guest OS.**
- It includes only components required to run an application.

Explanation: A virtual machine is a software emulation of a physical server including a CPU, memory, network interface, and guest operating system.

37. What is JSON?

- It is a database.
- It is a compiled programming language.
- **It is a data format for storing and transporting data.**
- It is a scripting language.

Explanation: JavaScript Object Notation (JSON) is a data format used by applications to store and transport data.

38. A student is studying in preparation for an interview for a job in programming and network automation. What is a characteristic of SaltStack SSH ?

- It is a programming interface that takes changes made to the management software and pushes the changes down to the individual devices.
- It is an acronym that describes functions that most applications or databases use to store or alter data.
- It is a programming interface that communicates from a network controller to its management software.

- **It is an agentless option of a configuration management tool that allows users to run commands without having to install an agent on the remote device or node.**

39. A student is studying in preparation for an interview for a job in programming and network automation. What is a characteristic of Puppet ?

- It is a free online tool that can check the format of programmed files to verify that they have valid syntax.
- **It is a configuration management and automation tool with a downloadable Cisco module to support Cisco devices.**
- It is a hosted web-based repository that uses version control for storing and sharing code.
- It is a markup programming language.