Module Practice and Quiz

14.7.1

What did I learn in this module?

Automation is any process that is self-driven, reducing and potentially eliminating, the need for human intervention. Whenever a course of action is taken by a device based on an outside piece of information, then that device is a smart device. For smart devices to "think", they need to be programmed using network automation tools.

Data formats are simply a way to store and interchange data in a structured format. One such format is called Hypertext Markup Language (HTML). Common data formats that are used in many applications including network automation and programmability are JavaScript Object Notation (JSON), eXtensible Markup Language (XML), and YAML Ain't Markup Language (YAML). Data formats have rules and structure similar to what we have with programming and written languages.

An API is a set of rules describing how one application can interact with another, and the instructions to allow the interaction to occur. Open/Public APIs are, as the name suggests, publicly available. Internal/Private APIs are used only within an organization. Partner APIs are used between a company and its business partners. There are four types of web service APIs: Simple Object Access Protocol (SOAP), Representational State Transfer (REST), eXtensible Markup Language-Remote Procedure Call (XML-RPC), and JavaScript Object Notation-Remote Procedure Call (JSON-RPC).

A REST API defines a set of functions developers can use to perform requests and receive responses via HTTP protocol such as GET and POST. Conforming to the constraints of the REST architecture is generally referred to as being "RESTful". RESTful APIs use common HTTP methods including POST, GET, PUT, PATCH and DELETE. These methods correspond to RESTful operations: Create, Read, Update, and Delete (or CRUD). Web resources and web services such as RESTful APIs are identified using a URI. A URI has two specializations, Uniform Resource Name (URN) and Uniform Resource Locator (URL). In a RESTful Web service, a request made to a resource's URI will elicit a response. The response will be a payload typically formatted in JSON. The different parts of the API request are API server, Resources, and Query. Queries can include format, key, and parameters.

There are now new and different methods for network operators to automatically monitor, manage, and configure the network. These include protocols and technologies such as REST, Ansible, Puppet, Chef, Python, JSON, XML, and more. Configuration management tools use RESTful API requests to automate tasks and scale across thousands of devices. Characteristics of the network that benefit from automation include software and version control, device attributes such as names, addressing, and security, protocol configurations, and ACL configurations. Configuration management tools typically include automation and orchestration. Orchestration is the arranging of the automated tasks that results in a coordinate process or workflow. Ansible, Chef, Puppet, and SaltStack all come with API documentation for configuring RESTful API requests.

IBN builds on SDN, taking a software-centric, fully automated approach to designing and operating networks. Cisco views IBN as having three essential functions: translation, activation, and assurance. The physical and virtual network infrastructure is a fabric. The term fabric describes an overlay that represents the logical topology used to virtually connect to devices. The underlay network is the physical topology that includes all hardware required to meet business objectives. Cisco implements the IBN fabric using Cisco DNA. The business intent is securely deployed into the network infrastructure (the fabric). Cisco DNA then continuously gathers data from a multitude of sources (devices and applications) to provide a rich context of information. Cisco DNA Center is the foundational controller and analytics platform at the heart of Cisco DNA. Cisco DNA Center is a network management and command center for provisioning and configuring network devices. It is a single interface hardware and software platform that focuses on assurance, analytics, and automation.

14.7.2

Module Quiz – Network Automation

1. What is JSON?
   - ⦿ It is a data format for storing and transporting data.
   - ○ It is a database.
   - ○ It is a compiled programming language.
   - ○ It is a scripting language.

2. What is an architectural constraint to which a true RESTful API web service must adhere?
   - ○ It must support the XML data format.
   - ⦿ It runs as client/server model.
   - ○ It uses HTTPS to transport data.
   - ○ It operates as a cloud service.

3. In the RESTful API request example, **http://www.mapquestapi.com/directions/v2/route?outFormat=json&key=KEY&from=San+Jose,Ca&to=Monterey,Ca**, which term describes the component **directions/v2/route?**
   - ○ parameters
   - ⦿ resources
   - ○ API server
   - ○ query

4. Which statement describes an API?
   - ○ It is a set of rules that filter network traffic for web-based applications.
   - ⦿ It is a set of functions and procedures that allows a client application to access the data of the service application.
   - ○ It is a programming language for creating a web-based application.
   - ○ It is a set of functions and subroutines to be used in a comprehensive application.

5. Which term describes the process of managing configuration changes of network devices in an orderly fashion?
   - ○ version control
   - ○ provisioning
   - ○ automation
   - ⦿ orchestration

6. Which web service API can use multiple data formats including JSON, XML, and YAML?
   - ○ JSON-RPC
   - ○ XML-RPC
   - ⦿ REST
   - ○ SOAP

7. What are two reasons that most RESTful APIs require a key in the request? (Choose two.)
   - ☐ to specify the data format expected from the response
   - ☑ to authenticate the requesting source
   - ☐ to encrypt the query message in the API request
   - ☐ to make sure that the query matches the service offered by the web application
   - ☑ to gather information on the people using the API

8. What is a difference between the XML and HTML data formats?
   - ○ XML formats data in hexadecimal whereas HTML formats data in binary.
   - ⦿ XML uses a self-descriptive data structure but HTML uses a standard document structure.
   - ○ XML encloses data within a pair of tags whereas HTML uses a pair of quotation marks to enclose data.
   - ○ XML requires indentation for each key/value pair whereas HTML does not require indentation.

9. A programmer is using Ansible as the configuration management tool. Which term is used to describe a set of instructions for execution?
   - ○ Pillar
   - ○ Manifest
   - ○ Cookbook
   - ⦿ Playbook

10. Which term is used to describe a set of instructions for execution by the configuration management tool Chef?
    - ⦿ Cookbook
    - ○ Pillar
    - ○ Playbook
    - ○ Manifest

11. Which two configuration management tools are developed using Python? (Choose two.)
    - ☐ Chef
    - ☑ Ansible
    - ☑ SaltStack
    - ☐ NETCONF
    - ☐ Puppet

12. Which function of the Cisco intent-based networking system (IBNS) enables network operators to express the expected networking behavior that will best support the business intent?
    - ○ activation
    - ○ assurance
    - ○ ACL analysis
    - ⦿ translation

13. Which types of APIs are suitable for the data communication between a travel website and a hotel chain inquiring about room availability data?
    - ○ internal APIs
    - ○ public APIs
    - ⦿ partner APIs
    - ○ open APIs

14. Which characters are used to enclose a JSON key?
    - ○ colons
    - ⦿ quotation marks
    - ○ commas
    - ○ square brackets

15. Which character is used to separate JSON key/value pairs?
    - ○ (forward slash) /
    - ○ (semi colon) ;
    - ○ (dash) -
    - ⦿ (comma) ,

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