Module 11 CCNA – Automation and Programmability

1. Explain how Automation Impacts Network management.

Ans-> Automation has a significant impact on network management, transforming how networks are configured, monitored, and maintained.

a. Improved Efficiency and productivity.

b. Enhanced consistency and accuracy

c. Scalability

d. Proactive monitoring and maintenance

e. Enhanced security

f. Cost Reduction

2. Compare Traditional network with controller based networking.

Ans-> Traditional network

a. Traditional network is the old conventional networking approach.

b. This network is non programmable.

c. It supports static/manual configuration so it takes more time.

d. Cost of traditional network is high.

Controller Based Networking

a. Virtual networking approach.

b. This network is programmable.

c. It supports automatic configuration so it takes less time.

3. Explain virtualization.

Ans-> Virtualization is used to create a virtual version of an underlying service with the help of virtualization, multiple operating systems and applications can run on the same machine and its same hardware at the same time, increasing the utilization and flexibility of the hardware.

4. Describe Characteristics of REST-based API

Ans-> A REST API (Representational State Transfer) is a widely-used architectural style for designing networked applications, particularly web services. It is characterized by the following principles:

1. Statelessness

2. Resource-based

3. Uniform Interface

4. Client-Server Architecture

5. Stateless communication

6. Cacheability

7. Layered System

8. Code on demand (optional)

5. Explain methods of automation.

Ans-> There are some methods of automation in network management are as follow :-

a. Network Automation: Automation tools are used to manage and configure network devices, such as routers, switches, and firewalls.

b. Security Automation: Security automation tools are used to detect and respond to security incidents and threats in real-time.

c. Infrastructure Automation: Infrastructure automation tools are used to manage the deploying and scaling of network infrastructure.

d. Orchestration Automation: Orchestration automation tools are used to manage the deployment and orchestration of services across distributed systems.

e. Provisioning Automation: Provisioning automation tools are used to automate the process of deploying and configuring network devices and services.

f. Monitoring Automation: Monitoring automation tools are used to collect and analyze network data and performance metrics.

5. Explain SDN.

Ans-> Software- defined networking (SDN) is an approach to network management that enables dynamic, programmatically efficient network configuration to improve network performance and monitoring. This is done by separating the control plane from data plane.

6. Explain DNA Center.

Ans-> DNA center is a centralized network management platform designed to automate, secure, and analyze network infrastructures in enterprise environments. It is part of Cisco’s Digital Network Architecture (DNA), focusing on Software-Defined Networking (SDN) to simplify network operations, automate tasks, and improve network performance.

7. Explain SD-Access and SD-WAN.

Ans->SD-Access: SD-Access is Cisco’s solution for automating and securing access control within local area networks (LANs), Particularly in campus environments. It applies software-defined networking (SDN) principles to simplify and automate LAN operations, including segmentation, policy enforcement, and network access for users and devices.

SD-WAN: SD-WAN is a software-defined approach to managing and optimizing wide area networks (WANs), which connect branch offices, data centers, and cloud environments. It leverages centralized control, traffic steering, and dynamic path selection to improve WAN performance and reduce costs.