Module 4
CCNA -Automation and Programmability
1 Explain How Automation Impacts Network Management
Compare Traditional network with Controller based
Networking
ans-Using software to automate tasks like configuration, monitoring, and troubleshooting in networks to improve efficiency, consistency, scalability, and agility.
Traditional: Each network device managed independently; changes require manual configuration.
Controller-Based (like SDN): Centralized management through a controller; simplifies management, allows for automation and policy enforcement.

2 Explain Virtualization
ans-Creating virtual instances of network devices or functions on shared hardware; optimizes resources, provides flexibility, and enables isolation for security.
3 Describe Characteristics of REST-based API
ans-Statelessness, uniform interface with standard HTTP methods (GET, POST, PUT, DELETE), client-server architecture, and cacheability to enhance performance.
Explain methods of Automation
Explain SDN
ans-SDN is an architecture that separates the network control plane (deciding where traffic is sent) from the data plane (forwarding traffic). Key points include:

- **Centralized Control**: Network control is managed centrally via a controller.
- **Programmability**: Networks can be programmed and automated using software-defined policies.
- **Flexibility**: Enables dynamic and agile network configuration and management.
- **Open Standards**: Uses open APIs for interoperability and integration with automation tools.

Explain DNA Center
ans-Cisco DNA Center is a centralized management platform for Cisco's Digital Network Architecture. Key features include:

- **Automation**: Simplifies network provisioning and management tasks.
- **Policy-based Management**: Applies consistent policies across the network.
- **Analytics**: Provides insights into network performance and security.
- **Integration**: Works with other Cisco technologies for end-to-end network automation.

Explain SD-Access and SD-WAN
ans-SD-Access is Cisco's solution for automating network access policies and segmentation. Key features include:

- **Automated Segmentation**: Simplifies network segmentation across LAN and WLAN.
- **Centralized Policy Enforcement**: Ensures consistent security policies.

- **Scalability**: Scales easily across large networks with automated provisioning.

SD-WAN simplifies and optimizes the management of WAN connections. Key features include:

- **Centralized Control**: Manages multiple WAN connections from a central controller.
- **Dynamic Path Selection**: Automatically selects the best path for traffic based on performance metrics.
- **Application Optimization**: Improves application performance by prioritizing traffic dynamically.

These summaries provide a quick overview of automation methods, SDN, DNA Center, SD-Access, and SD-WAN, highlighting their key functionalities and benefits in modern networking environments.