Module 11
CCNA -Automation and Programmability

1. Explain How Automation Impacts Network Management Compare Traditional network with Controller based networking.

Ans : **Automation in Network Management**

- It means using software and tools to perform tasks without needing human intervention. This can include configuring devices, monitoring performance, troubleshooting issues, and applying security updates.

Impact of Automation:

1. **Efficiency:** Tasks that used to take hours or days can now be done in minutes, freeing up IT staff to focus on more strategic work.
2. **Consistency:** Automated processes reduce the risk of human error, ensuring that configurations and updates are applied uniformly across the network.
3. **Speed:** Network changes can be implemented quickly, allowing organisations to adapt to new demands or issues faster.
4. **Proactive Management:** Automation can help detect and resolve problems before they impact users, improving overall reliability.

❖ **Traditional Networking:**

- **Manual Configuration:** Each device (like routers and switches) is configured individually. This can be time-consuming and some errors.
- **Static Control:** Changes often require manual updates to multiple devices, making it harder to adapt to new needs.
- **Limited Visibility:** Monitoring and managing the network can be complex, as data is siloed across different devices.

❖ **Controller-Based Networking (like SDN - Software-Defined Networking):**

- **Centralised Management:** A central controller manages the entire network, allowing for easier configuration and monitoring from one place.
- **Dynamic Control:** Changes can be made from the controller, automatically updating multiple devices at once. This makes adapting to changes much faster.
- **Enhanced Visibility:** A centralised approach provides better insights into network performance and traffic patterns, making troubleshooting easier.

2. Explain SDN

Ans : SDN full name is " **Software-defined network**".
SDN is an approach to networking that uses software-based controllers or application programming interfaces(APLs) to communicate with underlying hardware infrastructure and direct traffic on a network.

3. Explain DNA Centre

Ans : DNA's full name is " **Digital networking Architecture**".

- It is a Cisco GUI for managing all things in a Campus switch, wireless, IOT, etc. network ,now with tie-ins for SD-WAN.

4. Explain SD-Access and SD-WAN

Ans : Here we can say" **Cisco Software-Defined Access (SDA)"** and" **Software-Defined Wide Area Network (SD-WAN)"** are both Cisco technologies that enhance network security and agility.

- SD-Access : **SD-Access (Software-Defined Access)** is a technology that simplifies and automates how networks connect devices like computers, smartphones, and IoT devices. It allows network administrators to manage user access and security policies centrally, making it easier to control who can connect to the network and what resources they can use. Think of it like having a smart home system that automatically adjusts settings based on who is in the house.
- SD-WAN : **SD-WAN (Software-Defined Wide Area Network)**, is focused on connecting multiple locations—like different offices or branches—over the internet. It helps manage the traffic between these locations more efficiently and securely, often using multiple types of connections (like broadband, LTE, etc.) to ensure reliable performance. Imagine it as a GPS for data, choosing the best routes for information to travel, so everything runs smoothly.