**Module: 13 Networking with Windows Server**

**Installing and configure DNS server**

1. **Describe DNS operation**

* A Domain Name System (DNS) turns domain names into IP addresses, which allow browsers to get to websites and other internet resources. Every device on the internet has an IP address, which other devices can use to locate the device.

1. **DNS query—Iterative and Recursive**

* A recursive DNS lookup is where one DNS server communicates with several other DNS servers to hunt down an IP address and return it to the client. This is in contrast to an iterative DNS query, where the client communicates directly with each DNS server involved in the lookup.

1. **what is forward lookup zone and its resource type**

* Forward Lookup Zones—Forward Lookup Zones allow the DNS Server to resolve queries where the client sends a name to the DNS Server to request the IP address of the requested host. ▪ Reverse Lookup Zones—Reverse DNS zones perform the opposite task as Forward Lookup Zones.

1. **what is reverse lookup zone and its resource type**

* As mentioned earlier, a reverse lookup zone is an authoritative DNS zone that is used primarily to resolve IP addresses to network resource names. This zone type can be primary, secondary, or Active Directory—integrated.

1. **what is conditional forwarder**

* Conditional DNS forwarding is a method to direct DNS queries related to a specific domain to another DNS server. This is done by creating conditional DNS forwarders or rules on the DNS server. This is a simple and reliable method to resolve DNS queries belonging to an external domain.

1. **what is primary zone, secondary zone and stub zone**

* In summary, primary zones are read-write copies of zone data and hosted by primary DNS servers, secondary zones contain read-only copies of zone data and are used for load balancing and fault tolerance, and stub zones contain only resource records for the domain's name servers and are used for faster name resolution

1. **what is active directory integrated zone**

* Active Directory integrated zone is essentially a primary zone in the DNS services. The DNS records are securely stored in the Active Directory database. The advantage of this is that any Domain Controller with the DNS role installed can access the Active Directory Integrated zone.

1. **primary server, secondary server, cache only server**

* **Primary DNS servers contain all relevant resource records and handle DNS queries for a domain. By contrast, secondary DNS servers contain zone file copies that are read-only, meaning they cannot be modified.**

1. **what is aging and scavenging**

* It is a Windows DNS Server feature that will automate the cleanup of stale dynamically registered DNS records. DNS Scavenging will only remove records based on their timestamp. DNS scavenging will not remove statically configured records.

1. **what is MX record**

* **A DNS 'mail exchange' (MX) record directs email to a mail server. The MX record indicates how email messages should be routed in accordance with the Simple Mail Transfer Protocol (SMTP, the standard protocol for all email). Like CNAME records, an MX record must always point to another domain.**

**Practical**

1. **install active directory integrated dns**

* **YES**

1. **create secondary dns and zone transfer**

* **YES**

1. **create “A” record**

* **yes**

1. **create alias**

* **YES**

1. **create reverse lookupzone**

* **YES**

1. **make a pointer**

* **YES**

1. **apply conditional forwareder betwwen two different domain**

* **YES**

1. **nslookup command**

* **YES**

**DHCP**

1. **purpose of DHCP**

* Dynamic Host Configuration Protocol (DHCP) is a network protocol that is used to configure network devices to communicate on an IP network. A DHCP client uses the DHCP protocol to acquire configuration information, such as an IP address, a default route, and one or more DNS server addresses from a DHCP server.

1. **what is DORA process?**

* DORA stands for Discover, Offer, Request, Acknowledge. DHCP uses Dora Process to provide an IP Address to hosts or client machines. It collects all of the IP addresses from the central server that are accessible and gives them to hosts that want to connect to the network.

1. **what is authorised DHCP server?**

* A DHCP server that is a member server of an Active Directory domain performs a query in Active Directory to determine whether it is authorized. If it is, it will respond to DHCP requests, if not, it will not respond to requests.

1. **describe scope, lease duration, DHCP option, exclude address**

* To prevent address conflicts, you can create an exclusion range for the DHCP scope. An exclusion range is a contiguous range of IP addresses within the scope's IP address range that the DHCP server isn't allowed to use

1. **what is reservation?**

* Reservation is a system of affirmative action in India created during the British rule. It provides historically disadvantaged groups representation in education, employment, government schemes, scholarships and politics.

1. **what is dhcp relay agent?**

* The DHCP relay agent operates as the interface between DHCP clients and the server. The DHCP Relay Agent relays DHCP messages between DHCP clients and DHCP servers on different IP networks. This example describes how to configure the DHCP relay agent on the SRX Series Firewall.

1. **describe ipconfig command**

* pconfig (standing for "Internet Protocol configuration") is a console application program of some computer operating systems that displays all current TCP/IP network configuration values and refreshes Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS) settings. ipconfig.

**practical**

1. **install dhcp sever and make authorize**

* **YES**

1. **create a scope and check on client by ipconfig**

* **YES**

1. **dhcp database and take backup**

* **YES**

1. **dhcp failover**

* **YES**

1. **dhcp relay agent**

* **YES**

1. **dhcp filter**

* **YES**

1. **dhcp reservation**

* **YES**

**IPAM**

1. **what is IPAM and purpose of IPAM**

* IPAM (IP Address Management) is the administration of DNS and DHCP, which are the network services that assign and resolve IP addresses to machines in a TCP/IP network. Simply put, IPAM is a means of planning, tracking, and managing the Internet Protocol address space used in a network.

1. **why need dedicated server**

* Dedicated server benefits / From sources across the web
* Better Security
* Performance
* Reliability
* Security
* Scalability
* Customization
* Flexibility
* Dedicated resources

1. **policy for ipam sever**

* IPAM (IP Address Management) is the administration of DNS and DHCP, which are the network services that assign and resolve IP addresses to machines in a TCP/IP network. Simply put, IPAM is a means of planning, tracking, and managing the Internet Protocol address space used in a network.

1. **which service monitor and manage by IPAM**

* IPAM monitors domain controllers and NPS servers for IP address tracking purposes. In addition to monitoring functions, several DHCP server and scope properties can be configured from the IPAM console. Zone status monitoring and a limited set of configuration functions are also available for DNS servers.

**Practical**

1. **Install IPAM**

* **YES**

1. **configure IPAM with six step**

* **YES**

1. **create dhcp scope using IPAM 4 create DNS zone**

* **YES**

1. **check monitoring of sevices**

* **YES**

**Remote connectivity and VPN**

1. **what is VPN?**

* A VPN, which stands for virtual private network, establishes a digital connection between your computer and a remote server owned by a VPN provider, creating a point-to-point tunnel that encrypts your personal data, masks your IP address, and lets you sidestep website blocks and firewalls on the internet.

1. **type of VPN**

* A virtual private network, or VPN, is an encrypted connection over the Internet from a device to a network. The encrypted connection helps ensure that sensitive data is safely transmitted. It prevents unauthorized people from eavesdropping on the traffic and allows the user to conduct work remotely.

1. **tunneling protocol**

* A tunnelling protocol is one that encloses in its datagram another complete data packet that uses a different communications protocol. They essentially create a tunnel between two points on a network that can securely transmit any kind of data between them.

1. **authentication protocol**

* An authentication protocol allows the receiving party (such as a server) to verify the identity of another party (such as a person using a mobile device to log in). Almost every single computer system uses some kind of network authentication to verify users.

1. **what is routing**

* A computer network is made of many machines, called nodes, and paths or links that connect those nodes. Communication between two nodes in an interconnected network can take place through many different paths. Routing is the process of selecting the best path using some predetermined rules.

**Practical**

1. **install routing and remote access**

* **YES**

1. **configure LAN routing**

* **YES**

1. **configure vpn connection (VPN client)**

* **YES**

**Network policy server**

1. **what is Radius server**

* A RADIUS server is a central server that provides authentication and authorization services for remote users who access a network. It receives authentication requests from RADIUS clients, such as routers, firewalls, or VPNs, verifies the credentials of the user, and returns an authorization decision to the client.

1. **what is authentication authorization and accounting**

* Authentication and authorization are two vital information security processes that administrators use to protect systems and information. Authentication verifies the identity of a user or service, and authorization determines their access rights.

1. **RADIUS server operation method and radius client**

* A RADIUS server is a central server that provides authentication and authorization services for remote users who access a network. It receives authentication requests from RADIUS clients, such as routers, firewalls, or VPNs, verifies the credentials of the user, and returns an authorization decision to the client.

1. **RADIUS port number**

* RADIUS is transported over UDP/IP on ports 1812 and 1813.

1. **what is network policies (NPS)?**

* Network Policy Server (NPS) allows you to create and enforce organization-wide network access policies for connection request authentication and authorization.

**Practical**

1. **P1 configure RADIUS for wireless client**

* **YES**

1. **confiure NPS for remote access**

* **YES**

**IPv4 addressing and IPv6 addressing**

1. **what is ip address?And type of ip address**

* Typically assigned by an internet service provider (ISP), an IP address is an online device address used for communicating across the internet. There are two versions of IP addresses that are commonly used on the internet: IPv4 and IPv6.

1. **class of ip address**

* Public IP Range Private IP Range
* Class A 1.0.0.0 to 127.0.0.0 10.0.0.0 to 10.255.255.255
* Class B 128.0.0.0 to 191.255.0.0 172.16.0.0 to 172.31.255.255
* Class C 192.0.0.0 to 223.255.255.0 192.168.0.0 to 192.168.255.255

1. **public ip address and private ip address**

* A public IP address is a unique IP address assigned to your network router by your internet service provider and can be accessed directly over the internet. A private IP address is a unique address that your network router assigns to your device. It is used within a private network to connect securely to other devices.

1. **what is static ip address, dhcp and APIPA**

* APIPA serves as a DHCP server failover mechanism and makes it easier to configure and support small LANs. DHCP is a network management protocol that organizations can use to dynamically assign IP addresses and other network parameters to devices or nodes on their networks.

1. **what is ipv6 address?**

* An IPv6 address is 128 bits in length and consists of eight, 16-bit fields, with each field bounded by a colon. Each field must contain a hexadecimal number, in contrast to the dotted-decimal notation of IPv4 addresses.

1. **ipv6 dhcp process**

* The request/response processing for DHCPv6 is transaction based and uses a set of best-effort messages to complete the transaction. To find a server, a client sends a DHCP Solicit from the interface which it wishes to configure. The client then awaits a DHCP Advertise message containing an IP address of a DHCP server.

1. **what is NAT?**

* NAT stands for network address translation. It's a way to map multiple private addresses inside a local network to a public IP address before transferring the information onto the internet. Organizations that want multiple devices to employ a single IP address use NAT, as do most home routers.

1. **what id gateway address?**

* The gateway is used when transmitting packets. When packets are sent over a network, the destination IP address is examined. If the destination IP is outside of the network, then the packet goes to the gateway for transmission outside of the network. The gateway is on the same network as end devices

1. **what is loopback address?**

* The IP address 127.0. 0.1 is called a loopback address. Packets sent to this address never reach the network but are looped through the network interface card only. This can be used for diagnostic purposes to verify that the internal path through the TCP/IP protocols is working.

1. **different type of ipv6 address**

* The three types of IPv6 addresses are: unicast, anycast, and multicast. Unicast addresses identify a single interface. Anycast addresses identify a set of interfaces in such a way that a packet sent to an anycast address is delivered to a member of the set.

1. **ipv6 tunnelling**

* IPv6 Tunneling is a mechanism for encapsulating IPv4 and IPv6 packets inside IPv6 packets. It is used to form a virtual point-to-point link between two IPv6 nodes. IPv6 Tunnels are stateless and have no knowledge of the configuration or even existence of the remote tunnel endpoint.

**Practical**

1. **configure ipv6 address manually and test with ping**

* **YES**

1. **IPv6 address automatically**

* **YES**

1. **ping utility**

* **YES**

1. **ipconfig**

* **YES**

1. **tracert / traceroute**

* **YES**

1. **dhcpv6**

* **YES**

**DFS**

1. **what is DFS? And purpose of DFS**

* The Distributed File System (DFS) functions provide the ability to logically group shares on multiple servers and to transparently link shares into a single hierarchical namespace. DFS organizes shared resources on a network in a treelike structure.

1. **Define DFS namespace and DFS replication**

* DFS Namespaces and DFS Replication are role services in the File and Storage Services role. DFS Namespaces Enables you to group shared folders that are located on different servers into one or more logically structured namespaces. Each namespace appears to users as a single shared folder with a series of subfolders.

1. **what is folder target?**

* A folder target is the Universal Naming Convention (UNC) path of a shared folder or another namespace that is associated with a folder in a namespace. Adding multiple folder targets increases the availability of the folder in the namespace.

**Practical**

1. **install DFS namespace and replication**

* **YES**

1. **configure common namespace**

* **YES**

1. **configure replication and check**

* **YES**

1. **configure branch cache**

* **YES**

**Advance Network**

1. **what is SDN?**

* Software-Defined Networking (SDN) is an approach to networking that uses software-based controllers or application programming interfaces (APIs) to communicate with underlying hardware infrastructure and direct traffic on a network.

1. **what is SCVMM?**

* System Center Virtual Machine Manager, also known as System Center VMM or simply SCVMM, is a management tool developed by Microsoft to efficiently manage virtualized environments, particularly as a company's virtual machine and services deployment size increases.