Assignment-2

Unit-2

Computer Networks

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Scenario:- A national bank uses MPLS VPNs to isolate and secure branch traffic across the WAN.

Question:-

1. How does MPLS VPN ensure traffic segretation blw branches?

A) 1. **Label-Based forwading:**

* MPLS uses labels instead of IP adresses to forward packetes
* Each packet is assigned a unique label a pred defined path mix with traffic from other branchee.

2. **Virtual Routing and Forwarding (VRF):-**

* MPLS VPN uses seperate VRF instance for each branch
* VRF's allow the same am adress ranges to be used in different branches routing tables isolated.

3. **Traffic isolation via VPN instances:-**

* Each customer gets a VPN instance.
* The VPN instanees network over a shared MPLS.

4. **provides edge (PE) Routers Role.**

* PE routers manage the connection blw customer edge routers and the MPLS

5. **No overlap of Routing information:-**

* Routing information from one branch is not- Shared is not shared.

6. **End-to-End security:-**

    2) Though MPLS doesn't encrypt traffic by default It provide logical seperation
    2) security can be with 8p sec over MPLS if needed for encryption.

2. Explain the role of VRF in such a setup

Ans) 1) Traffic * segregation:

=> VRF allows multiple instances of routing tables to exist on same router

=> The traffic seperation for different customers.

2) improved * security:

=> Each VRF is isolated from other, ensuring that the from one interfere with traffic in another VRF.

3) overlapping * ip addresses :-

=> VRF allows the use of identical ip adress ranges in VRF's without conflict, making it suitable for multi-tenat environments.

4) Enhanced * scalability:-

=> Supports scalable network design by segmenting routing information.

=> The manage large-scale networks more efficiently

5) Simplified * Network * management!.

=> Allows logical seperation of networks on a shared infrastructe.

=> The reducing hardware casts and simpldtying overall network design.

6) MPLS integration:-
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=> The commonly used in MPLS VPNs to maintain customer-specific routing tables and ensure end-to-end traffic isolation.