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FAKULTAS ILMU KOMPUTER
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MATA KULIAH : Jaringan Mobile

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Implementasi Topologi VLAN dengan Cisco Packet Tracer

1. **Gambaran Umum Topologi**

   Topologi ini terdiri dari beberapa perangkat utama:

   - Internet ISP → sumber koneksi internet.
   - Router MikroTik RB450Gx4 → gateway utama (dapat diganti Cisco Router di Packet Tracer).
   - Switch Manageable (Ruijie RG-ES205GC) → switch layer 2 yang mendukung VLAN dan trunking.
   - Beberapa VLAN:
     a. VLAN 10 → Yayasan
     b. VLAN 20 → Guru
     c. VLAN 30 → CCTV
     d. VLAN 40 → NVR
     e. VLAN 50 → Hotspot/WiFi

2. Perangkat yang Digunakan di Cisco Packet Tracer

No	Perangkat	Jumlah	Fungsi
1	Router (Cisco 2811)	1	Sebagai gateway antar VLAN
2	Switch (Cisco 2960)	1	Switch manageable untuk VLAN
3	PC	2	Room 1 dan Room 2
4	Server (opsional)	1	Hotspot / DHCP server
5	IP Camera (diganti PC)	1	CCTV device
6	NVR (diganti PC)	1	Network Video Recorder
7	Access Point (opsional)	1	Hotspot WiFi
8	Cloud	1	Internet ISP

3. Subnet dan VLAN Configuration Plan

VLAN	Nama	IP Network	Gateway	Perangkat
10	Yayasan	192.168.10.0/24	192.168.10.1	Room 1
20	Guru	192.168.20.0/24	192.168.20.1	Room 2
30	CCTV	192.168.30.0/24	192.168.30.1	Outdoor Camera
40	NVR	192.168.40.0/24	192.168.40.1	NVR Device
50	Hotspot/WiFi	192.168.50.0/24	192.168.50.1	Access Point

4. Langkah Implementasi di Cisco Packet Tracer

Langkah-langkah:

a. Tambahkan perangkat sesuai tabel di atas.
b. Konfigurasikan VLAN pada switch.
c. Atur port access dan trunk.
d. Lakukan konfigurasi sub-interface di router (Router-on-a-Stick).
e. Tetapkan IP Address pada tiap PC.
f. Uji konektivitas antar VLAN.

Konfigurasi Switch:

enable
configure terminal
vlan 10
name Yayasan
exit
vlan 20
name Guru
exit
vlan 30
name CCTV
exit
vlan 40
name NVR
exit
vlan 50
name Hotspot
exit
interface range fa0/1
switchport mode access
switchport access vlan 10
exit
interface range fa0/2
switchport mode access
switchport access vlan 20

exit

interface range fa0/3

switchport mode access

switchport access vlan 30

exit

interface range fa0/4

switchport mode access

switchport access vlan 40

exit

interface range fa0/5

switchport mode access

switchport access vlan 50

exit

interface gig0/1

switchport trunk encapsulation dot1q

switchport mode trunk

switchport trunk allowed vlan all

exit

Konfigurasi Router:

enable

configure terminal

interface gig0/0

no shutdown

interface gig0/0.10

encapsulation dot1Q 10

ip address 192.168.10.1 255.255.255.0

exit

interface gig0/0.20

encapsulation dot1Q 20

ip address 192.168.20.1 255.255.255.0

exit

interface gig0/0.30

encapsulation dot1Q 30

ip address 192.168.30.1 255.255.255.0

exit

interface gig0/0.40

encapsulation dot1Q 40

ip address 192.168.40.1 255.255.255.0

exit

interface gig0/0.50

encapsulation dot1Q 50

ip address 192.168.50.1 255.255.255.0

exit

5. IP Address Tiap PC

PC	VLAN	IP	Gateway
Room1	10	192.168.10.10	192.168.10.1
Room2	20	192.168.20.10	192.168.20.1
CCTV	30	192.168.30.10	192.168.30.1
NVR	40	192.168.40.10	192.168.40.1
Hotspot	50	192.168.50.10	192.168.50.1

6. Penjelasan Detail Topologi

- Router: Gateway antar VLAN.
- Switch Manageable: Memisahkan broadcast domain.
- VLAN 10: Segmen Yayasan.
- VLAN 20: Segmen Guru.
- VLAN 30: CCTV.
- VLAN 40: NVR.
- VLAN 50: Hotspot/WiFi.
- Trunk Port: Penghubung antar VLAN.
- Access Port: Port khusus untuk end device.

7. Kesimpulan

Topologi VLAN ini berhasil memisahkan jaringan berdasarkan fungsi, meningkatkan keamanan, dan efisiensi lalu lintas data.

Dengan konfigurasi router-on-a-stick, semua VLAN dapat saling berkomunikasi dengan routing antar VLAN melalui sub-interface.