

UTS JARINGAN KOMPUTER LANJUT

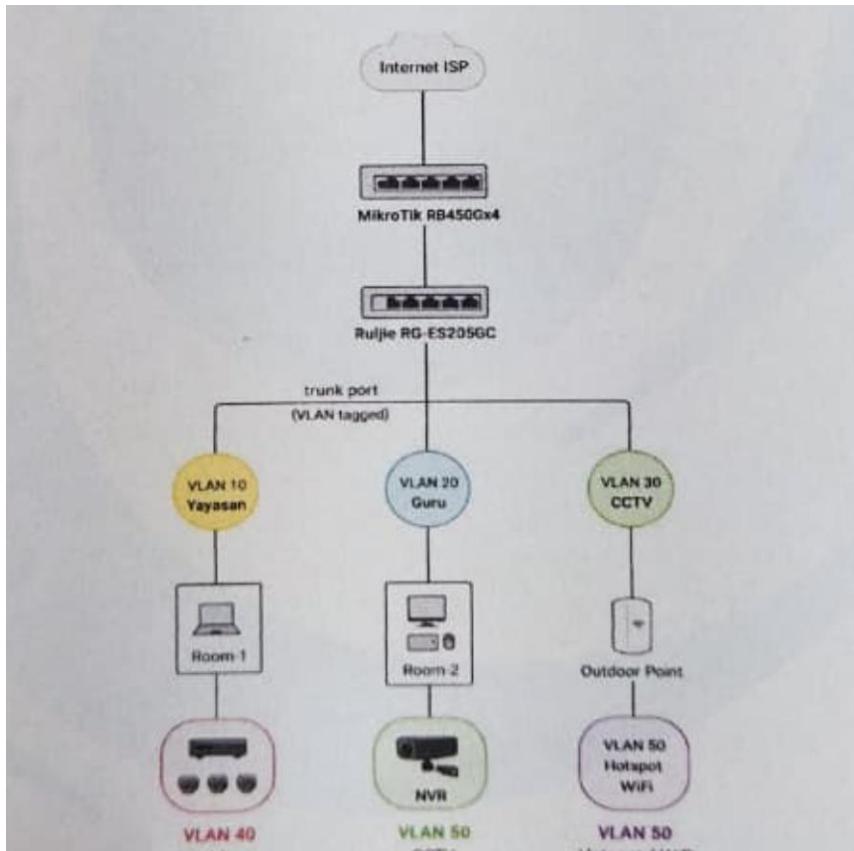


UTS

Mata Kuliah Jaringan Komputer Lanjut

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1. Topologi Jaringan



Topologi jaringan yang diimplementasikan terdiri dari Internet Service Provider (ISP) yang terhubung ke Router Core (Cisco 2911), kemudian router terhubung ke Switch Core (Cisco 2960) melalui trunk port yang membawa multiple VLAN. Dari switch, traffic didistribusikan ke berbagai segmen jaringan berdasarkan VLAN.

2. Alokasi IP Address

| VLAN | Nama | Subnet | Gateway |
|------|----------------------|------------------|--------------|
| 10 | Yayasan | 192.168.10.0/24 | 192.168.10.1 |
| 20 | Guru | 192.168.20.0/24 | 192.168.20.1 |
| 30 | CCTV Internal | 192.168.30.0/24 | 192.168.30.1 |
| 40 | Room1 CCTV | 192.168.40.0/24 | 192.168.40.1 |
| 50 | NVR/Hotspot | 192.168.50.0/24 | 192.168.50.1 |
| WAN | Koneksi antar-router | 192.168.100.0/30 | - |

3. Langkah-Langkah Konfigurasi

- Konfigurasi Router 1 (ISP Router)

```
enable
conf t

! Mengatur interface GigabitEthernet0/0 untuk ke Router 2
interface GigabitEthernet0/0
    ip address 192.168.100.1 255.255.255.252
    no shutdown
exit

! Menambahkan route menuju jaringan internal
ip route 192.168.10.0 255.255.255.0 192.168.100.2
ip route 192.168.20.0 255.255.255.0 192.168.100.2
ip route 192.168.30.0 255.255.255.0 192.168.100.2
ip route 192.168.40.0 255.255.255.0 192.168.100.2
ip route 192.168.50.0 255.255.255.0 192.168.100.2

end
wr
```

- Konfigurasi Router 2 (mikrotik)

```
enable
conf t

! Interface ke ISP Router 1
interface GigabitEthernet0/0
ip address 192.168.100.2 255.255.255.252
no shutdown
exit

! Interface ke Switch
interface GigabitEthernet0/1
no ip address
no shutdown

! Sub-interface VLAN 10 (Yayasan)
interface GigabitEthernet0/1.10
encapsulation dot1Q 10
ip address 192.168.10.1 255.255.255.0
exit

! Sub-interface VLAN 20 (Guru)
interface GigabitEthernet0/1.20
encapsulation dot1Q 20
ip address 192.168.20.1 255.255.255.0
exit

! Sub-interface VLAN 30 (CCTV)
interface GigabitEthernet0/1.30
encapsulation dot1Q 30
ip address 192.168.30.1 255.255.255.0
exit

! Sub-interface VLAN 40 (Room1 CCTV)
interface GigabitEthernet0/1.40
encapsulation dot1Q 40
ip address 192.168.40.1 255.255.255.0
exit

! Sub-interface VLAN 50 (NVR / Hotspot)
interface GigabitEthernet0/1.50
encapsulation dot1Q 50
ip address 192.168.50.1 255.255.255.0
exit

! Route default ke ISP Router
ip route 0.0.0.0 0.0.0.0 192.168.100.1

end
wr
```

- Konfigurasi Switch

```
enable
conf t

! Membuat VLAN
vlan 10
  name YAYASAN
vlan 20
  name GURU
vlan 30
  name CCTV_INTERNAL
vlan 40
  name ROOM1_CCTV
vlan 50
  name NVR_HOTSPOT
exit

! Port trunk ke Router
interface GigabitEthernet0/1
  description TRUNK_TO_ROUTER
  switchport trunk encapsulation dot1q
  switchport mode trunk
  switchport trunk allowed vlan 10,20,30,40,50
  no shutdown
exit

! Port access untuk masing-masing perangkat
interface FastEthernet0/2
  description Laptop_Yayasan
  switchport mode access
  switchport access vlan 10
  no shutdown
exit

interface FastEthernet0/3
  description PC_Guru
  switchport mode access
  switchport access vlan 20
  no shutdown
exit

interface FastEthernet0/4
  description CCTV_Internal
  switchport mode access
  switchport access vlan 30
  no shutdown
exit

interface FastEthernet0/5
  description Room1_CCTV
  switchport mode access
  switchport access vlan 40
  no shutdown
exit

interface FastEthernet0/8
  description NVR_HOTSPOT
  switchport mode access
  switchport access vlan 50
  no shutdown
exit

end
wr
```

4. Kesimpulan

- Trunking berhasil karena semua VLAN dapat dilewatkan melalui satu kabel fisik dari switch ke router.
- Router-on-a-Stick diimplementasikan dengan baik menggunakan sub-interface untuk tiap VLAN.
- Routing antar VLAN (Inter-VLAN Routing) berjalan sukses, memungkinkan komunikasi antar departemen.
- Koneksi antar-router (ISP) menggunakan subnet /30 agar efisien dan aman.
- Seluruh perangkat LAN dapat berkomunikasi dan mengakses internet melalui router ISP.