EX.NO :07	Inter-VLAN Routing	REG.NO: URK22AI1048
DATE: 04 - 10 -2023		

AIM

To design a network topology and configure Inter VLAN using packet tracer and test the connectivity between all the hosts in every VLANs.

DESCRIPTION

Inter-VLAN routing refers to the movement of packets across the network between hosts in different network segments. VLANs make it easier for one to segment a network, which in turn improves the performance of the network and makes it more flexible, since they are logical connections. VLANs act as separate subnet on the network.

CONFIGURATION COMMANDS

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.Switch(config)#int
fa0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int fa0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int fa0/4
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config)#int gig0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int gig0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#end
```

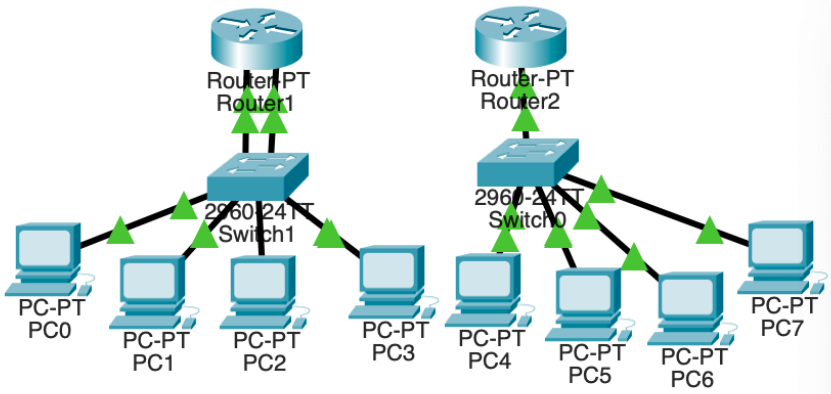
CONFIGURATION COMMANDS(Router)

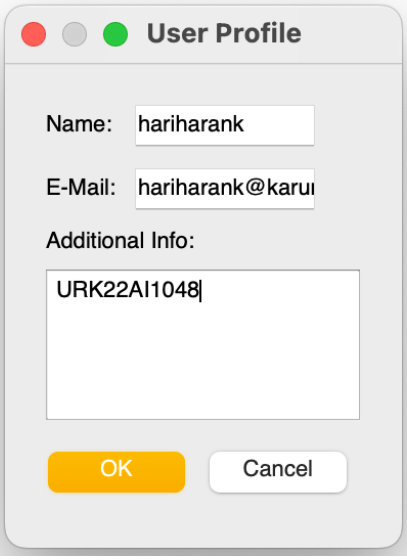
```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip addr 192.168.10.1 255.255.255.0
Router(config-if)#no sh
Router(config-if)#int fa1/0
Router(config-if)#ip addr 172.168.10.1 255.255.0.0
Router(config-if)#no sh
Router(config-if)#end
```

PROCEDURE

1. Configure IP Addressing on the Host PCs.
2. Configure Routers Interfaces.
3. Configure the routers to install the VLAN configuration in the switch and router.
4. Test and Verify the Configurations.

TOPOLOGY DIAGRAM





ADDRESSING TABLE

Device	Interface	IP Address	Subnet Mask	Default Gateway
R0	Fa0/0	192.168.10.0	255.255.255.0	NA
	Fa1/0	172.168.20.0	255.255.0.0	NA
PC0	NIC	192.168.10.2	255.255.255.0	192.168.10.1
PC1	NIC	192.168.10.3	255.255.255.0	192.168.10.1
PC2	NIC	172.168.20.2	255.255.0.0	172.168.20.1
PC3	NIC	172.168.20.3	255.255.0.0	172.168.20.1

OUTPUT

Screenshot of successful ping from PC to Router

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.168.10.2

Pinging 172.168.10.2 with 32 bytes of data:

Reply from 172.168.10.2: bytes=32 time=1ms TTL=127
Reply from 172.168.10.2: bytes=32 time<1ms TTL=127
Reply from 172.168.10.2: bytes=32 time=1ms TTL=127
Reply from 172.168.10.2: bytes=32 time<1ms TTL=127

Ping statistics for 172.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Screenshot of show running-config of Switch

```
Switch#
Switch#sh running-config
Building configuration...

Current configuration : 1386 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/2
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 20
 switchport mode access
!
```

Screenshot of Routing Table of the Router

```
Router#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     172.168.0.0/24 is subnetted, 1 subnets
C       172.168.10.0 is directly connected, FastEthernet1/0
C    192.168.10.0/24 is directly connected, FastEthernet0/0

Router#
```

Screenshot of Show vlan

```
Switch# sh vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
10   keba                              active    Fa0/1, Fa0/2, Gig0/1
20   1015                              active    Fa0/3, Fa0/4, Gig0/2
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
10   enet  100010     1500  -      -      -        -    -        0      0
20   enet  100020     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
 --More--
```

Screenshot of Show vlan brief

```
Switch#sh vlan brief

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
10   keba                              active    Fa0/1, Fa0/2, Gig0/1
20   1015                              active    Fa0/3, Fa0/4, Gig0/2
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
```

Screenshot of Trunk Interfaces

```
.
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport access vlan 10
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 10
 switchport mode trunk
!
interface FastEthernet0/3
 switchport access vlan 20
 switchport mode trunk
!
interface FastEthernet0/4
 switchport access vlan 20
 switchport mode trunk
!
```

Screenshot of Switchport

```
.
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport access vlan 10
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 10
 switchport mode trunk
!
interface FastEthernet0/3
 switchport access vlan 20
 switchport mode trunk
!
interface FastEthernet0/4
 switchport access vlan 20
 switchport mode trunk
!
```

RESULT:

The above topology was created and the required vlans was created and the packets where transferred between the desired pc in the vlans.