Cisco Packet Tracer Configuration Notes: Hybrid Topology

These notes detail the required configurations for the Router and Switches in the Hybrid Topology shown in the image, ensuring compliance with the project requirements (IPv4/IPv6, VLANs, and Server setup).

1. VLAN Definitions (Required on all Switches)

VLAN segmentation is critical as defined by the colored areas in the image.

VLAN ID	Name	IPv4 Subnet
10	DATA_USERS	192.168.10.0/24
20	SERVER_VLAN	192.168.20.0/24
30	PRINTERS_IOTS	192.168.30.0/24

2. Router Configuration (e.g., Router-PT Router)

The router is responsible for Inter-VLAN Routing (Router-on-a-Stick) and assigning IPv4/IPv6 addresses.

2.1 Basic Setup

```
Router> enable
Router# configure terminal
Router(config)# hostname R1-Hybrid
Router(config)# service password-encryption
Router(config)# enable secret CiscoPass
Router(config)# line console 0
Router(config-line)# password ConsolePass
Router(config-line)# login
Router(config-line)# exit
```

2.2 Inter-VLAN Routing (802.1Q Trunking)

Assuming the link from the Router to Switch0 is on GigabitEthernet 0/0.

```
! Disable the physical interface
Router(config)# interface GigabitEthernet0/0
Router(config-if)# no ip address
Router(config-if)# no shutdown
Router(config-if)# exit

! Sub-interface for VLAN 10 (192.168.10.1 is the gateway)
Router(config)# interface GigabitEthernet0/0.10
```

```
Router(config-subif)# encapsulation dot1Q 10
Router(config-subif)# ip address 192.168.10.1 255.255.255.0
Router(config-subif)# ipv6 address 2001:DB8:A001::1/64
Router(config-subif)# exit

! Sub-interface for VLAN 20 (192.168.20.1 is the gateway)
Router(config)# interface GigabitEthernet0/0.20
Router(config-subif)# encapsulation dot1Q 20
Router(config-subif)# ip address 192.168.20.1 255.255.255.0
Router(config-subif)# ipv6 address 2001:DB8:A002::1/64
Router(config-subif)# exit

! Sub-interface for VLAN 30 (192.168.30.1 is the gateway)
Router(config)# interface GigabitEthernet0/0.30
Router(config-subif)# encapsulation dot1Q 30
Router(config-subif)# ip address 192.168.30.1 255.255.255.0
Router(config-subif)# ipv6 address 2001:DB8:A003::1/64
Router(config-subif)# exit
```

2.3 DHCP Server (Optional, if not using a dedicated DHCP server)

```
! Exclude router and server addresses from DHCP range
Router(config)# ip dhcp excluded-address 192.168.10.1 192.168.10.10
Router(config)# ip dhcp excluded-address 192.168.20.1 192.168.20.10
Router(config)# ip dhcp excluded-address 192.168.30.1 192.168.30.10

Router(config)# ip dhcp pool VLAN_10_POOL
Router(dhcp-config)# network 192.168.10.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.10.1
Router(dhcp-config)# dns-server 192.168.20.9  ! Assuming Server0 is the DNS server
Router(dhcp-config)# exit

Router(config)# ip dhcp pool VLAN_30_POOL
Router(dhcp-config)# network 192.168.30.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.30.1
Router(dhcp-config)# dns-server 192.168.20.9
Router(dhcp-config)# exit
```