

Here's a concise list of **Cisco networking commands** used in each practical using **Packet Tracer**,

1. Router Configuration & Protocols

a) Router Basic Configuration & RIP

```
Router> enable
Router# configure terminal
Router(config)# hostname R1
Router(config)# interface FastEthernet0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config)# router rip
Router(config-router)# version 2
Router(config-router)# network 192.168.1.0
```

Explanation: Enables the router, sets the hostname, configures an interface with IP and subnet, and enables RIP version 2. The network command enables RIP on the specified network for route exchange.

b) Access Control Lists (ACLs)

Standard ACL:

```
Router(config)# access-list 1 permit 192.168.1.0 0.0.0.255
Router(config)# interface FastEthernet0/0
Router(config-if)# ip access-group 1 in
```

Extended ACL:

```
Router(config)# access-list 100 permit tcp 192.168.1.0 0.0.0.255 any eq 80
Router(config)# interface FastEthernet0/0
Router(config-if)# ip access-group 100 in
```

Explanation: Standard ACLs filter traffic based on **source IP**, while extended ACLs filter based on **source, destination, and protocol/port**. ACLs are applied to an interface in **inbound or outbound** direction.

c) NAT (Static, Dynamic, PAT)

Static NAT:

```
Router(config)# ip nat inside source static 192.168.1.10 203.0.113.10
```

```
Router(config)# interface FastEthernet0/0
Router(config-if)# ip nat inside
Router(config)# interface Serial0/0/0
Router(config-if)# ip nat outside
```

Dynamic NAT:

```
Router(config)# access-list 1 permit 192.168.1.0 0.0.0.255
Router(config)# ip nat pool MYPPOOL 203.0.113.10 203.0.113.20 netmask 255.255.255.0
Router(config)# ip nat inside source list 1 pool MYPPOOL
```

PAT (Overloading):

```
Router(config)# ip nat inside source list 1 interface Serial0/0/0 overload
```

Explanation: NAT translates private IPs to public IPs. Static NAT maps one-to-one, Dynamic NAT uses a pool, and PAT allows multiple devices to share a single IP using different ports (overloading).

2. Routing Protocol Configuration

a) EIGRP Configuration

```
Router(config)# router eigrp 100
Router(config-router)# network 192.168.1.0 0.0.0.255
Router(config-router)# no auto-summary
```

Explanation: eigrp 100 enables EIGRP with Autonomous System number. network advertises networks, and no auto-summary prevents automatic summarization. EIGRP uses K values (defaults: K1=1, K3=1) to compute metrics like bandwidth and delay.

b) OSPF Configuration

```
Router(config)# router ospf 1
Router(config-router)# network 192.168.1.0 0.0.0.255 area 0
```

Explanation: OSPF uses areas for hierarchy and LSAs for route exchange. router ospf 1 starts the process, and the network command includes interfaces in OSPF. Metric is based on bandwidth, and neighbor relationships require matching hello/dead timers.

c) WLAN with Static IP & DHCP with MAC Security

Static IP on PC:

PC Settings > IP Configuration > Static

IP: 192.168.0.10, Subnet: 255.255.255.0, Gateway: 192.168.0.1

DHCP Configuration on Router:

```
Router(config)# ip dhcp pool WIFI
Router(dhcp-config)# network 192.168.0.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.0.1
Router(dhcp-config)# dns-server 8.8.8.8
Router(config)# ip dhcp excluded-address 192.168.0.1 192.168.0.10
```

MAC Filtering on Wireless Router:

Wireless Router > Wireless > MAC Filtering
Add allowed MAC addresses only

Explanation: Devices can use either static or DHCP IP configuration. DHCP assigns IPs dynamically, excluding reserved ones. MAC filtering enhances security by allowing only listed devices to connect.



Common Router Commands in Packet Tracer

When using routers in the network:

```
bash
CopyEdit
Router> enable
Router# configure terminal
Router(config)# interface FastEthernet0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# exit
Router(config)# ip route 0.0.0.0 0.0.0.0 <next_hop_IP>
```

Explanation:

- These commands assign IPs to router interfaces and bring them up.
- Default routing allows PCs/servers to communicate across networks.