DHCP Pool — Cisco Packet Tracer

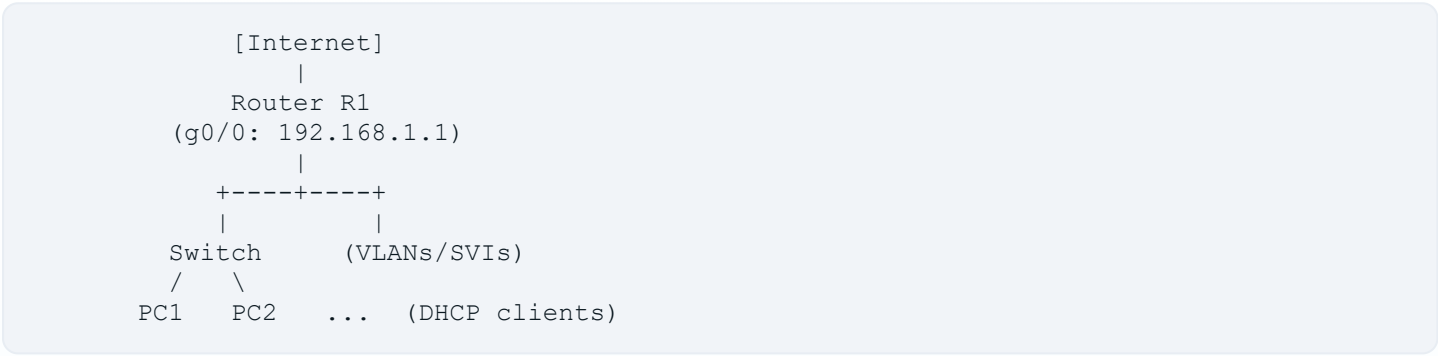
Quick summary

DHCP (Dynamic Host Configuration Protocol) assigns IPv4 addressing and related network settings automatically to hosts. This guide uses two example pools: a primary LAN and a STUDENTS pool.

Primary network: **192.168.1.0/24** | Primary gateway: **192.168.1.1** | Excluded: **192.168.1.1 - 192.168.1.10**

Second pool: **10.0.10.0/24 (STUDENTS)**

Network diagram (simple)



Notes: Router interface g0/0 acts as gateway for the primary LAN. For multiple VLANs use SVI on L3 switch or `ip helper-address`.

Step 1 — Enter CLI

```
Router> enable
Router# configure terminal
```

Open router → CLI tab in Packet Tracer. Press *Enter* until you see the prompt.

Step 2 — Configure router interface (gateway)

```
Router(config)# interface GigabitEthernet0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config-if)# exit
```

Adjust interface name if your device uses `FastEthernet`.

Step 3 — Exclude addresses from DHCP

```
Router(config)# ip dhcp excluded-address 192.168.1.1 192.168.1.10
```

Reserve static addresses (gateway, servers, printers). Excluded range is inclusive.

Step 4 — Create primary DHCP pool (LAN)

```
Router(config)# ip dhcp pool LAN
Router(dhcp-config)# network 192.168.1.0 255.255.255.0
Router(dhcp-config)# default-router 192.168.1.1
Router(dhcp-config)# dns-server 8.8.8.8 8.8.4.4
Router(dhcp-config)# lease 7
Router(dhcp-config)# exit
```

Replace DNS or lease time as needed.

Step 5 — Create second DHCP pool (STUDENTS)

```
Router(config)# ip dhcp pool STUDENTS
Router(dhcp-config)# network 10.0.10.0 255.255.255.0
Router(dhcp-config)# default-router 10.0.10.1
Router(dhcp-config)# dns-server 1.1.1.1
Router(dhcp-config)# lease 3
Router(dhcp-config)# exit
```

If VLANs are used, configure SVI or appropriate interfaces with the pool's gateway IPs, then set DHCP relay where necessary.

Step 6 — (Optional) Exclude range for second pool

```
Router(config)# ip dhcp excluded-address 10.0.10.1 10.0.10.10
```

Always ensure excluded addresses are outside the usable DHCP range you want to provide.

Step 7 — Save configuration

```
Router# write memory
! or
Router# copy running-config startup-config
```

Save to preserve after reload.

VERIFY DHCP (commands)

```
Router# show ip dhcp binding
Router# show ip dhcp pool
Router# show running-config | section dhcp
Router# show ip interface brief
```

Use `show ip dhcp binding` to see assigned addresses and client MACs. Use PC side to check obtained IPs in Desktop → IP Configuration.

DHCP Theory — DORA (How DHCP works)

1. **Discover** — Client broadcasts DHCPDISCOVER seeking DHCP servers.
2. **Offer** — Server replies with DHCPOFFER including an IP and options.
3. **Request** — Client broadcasts DHCPREQUEST asking for the offered IP.
4. **Acknowledge** — Server sends DHCPACK and the client configures the IP.

If multiple servers respond, client selects one. When using separate DHCP server and clients on different subnets, configure `ip helper-address` on router/SVI.

Troubleshooting & tips

- Check interface status: `show ip interface brief` and ensure `no shutdown`.
- Make sure excluded-address does not exhaust the pool.
- Use `debug ip dhcp server events` for live server logs (careful on production/labs as it's verbose).
- For VLANs: either run DHCP on L3 device per-VLAN or use DHCP relay/helper to forward requests to central server.