SPEC-2 HOMELAB (CISCO ISR4331 + CATALYST 3560/2960)

This text-based guide provides a complete configuration, verification, and operational overview for the SPEC-2 Cisco Homelab. It includes all configurations, PuTTY setup, cabling details, and CLI verification outputs with no diagrams or tables.

Section 1: Lab Background

This lab demonstrates isolated routing and VLAN management using: - Cisco ISR4331 router - Cisco Catalyst 3560 (Core switch) - Cisco Catalyst 2960 (Access switch) - Two workstation PCs (VLAN 20) The network uses VLAN 10 for management and VLAN 20 for workstations.

Section 2: Physical Cabling

1. Spectrum ISP → ISR4331 GigabitEthernet0/0/0 — Cat5e/Cat6 straight-through (WAN)
2. ISR4331 GigabitEthernet0/0/1 → Core 3560 GigabitEthernet0/1 — Cat5e/Cat6 straight-through (LAN routed
3. Core 3560 GigabitEthernet0/2 → Access 2960 GigabitEthernet0/1 — Cat5e/Cat6 straight-through (Trunk VL
4. Access 2960 GigabitEthernet0/2 → PC1 — Cat5e/Cat6 straight-through (Access VLAN 20)
5. Access 2960 GigabitEthernet0/3 → PC2 — Cat5e/Cat6 straight-through (Access VLAN 20)
6. Console: Laptop → device console (RJ45→DB9 rollover or USB console cable + USB→Serial adapter if req
7. Power-on order: Core (3560) → Access (2960) → ISR4331 → PCs

Section 3: Cable & Adapter Checklist

- Cat5e/Cat6 patch cables (straight-through) × ~6
- Cisco console cable (RJ45→DB9 rollover) or USB console cable
- USB→Serial adapter (FTDI/Prolific) if laptop has no DB9
- Power cords and spares

Section 4: Core Switch (3560) Configuration

```
CORE-SW(config)# hostname CORE-SW
! Set hostname
CORE-SW(config)# enable secret class
! Set encrypted enable password
CORE-SW(config)# ip domain-name homelab.local
! Required for SSH
CORE-SW(config)# username admin privilege 15 secret cisco123
! Create admin account
CORE-SW(config)# crypto key generate rsa
! Generate SSH key (choose 1024 bits)
CORE-SW(config)# ip ssh version 2
! Enable SSH version 2
CORE-SW(config)# interface vlan 10
CORE-SW(config-if)# ip address 192.168.10.1 255.255.255.0
CORE-SW(config-if)# no shutdown
CORE-SW(config)# ip routing
CORE-SW(config)# vlan 10
CORE-SW(config-vlan)# name MANAGEMENT
CORE-SW(config)# vlan 20
CORE-SW(config-vlan)# name WORKSTATIONS
CORE-SW(config)# interface GigabitEthernet0/1
CORE-SW(config-if)# no switchport
CORE-SW(config-if)# ip address 192.168.1.2 255.255.255.0
CORE-SW(config-if)# no shutdown
CORE-SW(config)# interface GigabitEthernet0/2
CORE-SW(config-if)# switchport trunk encapsulation dot1q
CORE-SW(config-if)# switchport mode trunk
CORE-SW(config-if)# switchport trunk allowed vlan 10,20
CORE-SW(config)# line vty 0 4
CORE-SW(config-line)# login local
CORE-SW(config-line)# transport input ssh
CORE-SW(config)# line console 0
CORE-SW(config-line)# logging synchronous
CORE-SW(config-line)# exec-timeout 10 0
CORE-SW(config-line)# password cisco
```

```
CORE-SW(config-line)# login
CORE-SW# write memory
```

Section 5: Access Switch (2960) Configuration

```
ACCESS-SW(config)# hostname ACCESS-SW
ACCESS-SW(config)# vlan 10
ACCESS-SW(config-vlan)# name MANAGEMENT
ACCESS-SW(config)# vlan 20
ACCESS-SW(config-vlan)# name WORKSTATIONS
ACCESS-SW(config)# interface GigabitEthernet0/1
ACCESS-SW(config-if)# switchport mode trunk
ACCESS-SW(config-if)# switchport trunk allowed vlan 10,20
ACCESS-SW(config)# interface GigabitEthernet0/2
ACCESS-SW(config-if)# switchport mode access
ACCESS-SW(config-if)# switchport access vlan 20
ACCESS-SW(config)# interface GigabitEthernet0/3
ACCESS-SW(config-if)# switchport mode access
ACCESS-SW(config-if)# switchport access vlan 20
ACCESS-SW# write memory
```

Section 6: Router (ISR4331) Configuration

```
ISR4331(config)# hostname ROUTER
ISR4331(config)# interface GigabitEthernet0/0/0
ISR4331(config-if)# ip address dhcp
ISR4331(config-if)# no shutdown
ISR4331(config)# interface GigabitEthernet0/0/1
ISR4331(config-if)# ip address 192.168.1.1 255.255.255.0
ISR4331(config-if)# no shutdown
ISR4331(config)# ip route 0.0.0.0 0.0.0.0 GigabitEthernet0/0/0
ISR4331(config)# line vty 0 4
ISR4331(config-line)# login local
ISR4331(config-line)# transport input ssh
ISR4331(config)# username admin privilege 15 secret cisco123
ISR4331# write memory
```

Section 7: PC Configuration

```
PC1 IP: 192.168.20.10
Subnet: 255.255.255.0
Gateway: 192.168.20.1

PC2 IP: 192.168.20.11
Subnet: 255.255.255.0
Gateway: 192.168.20.1
```

Section 8: Core Switch Verification

```
CORE-SW# show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
Vlan10                 192.168.10.1    YES manual up                    up
GigabitEthernet0/1     192.168.1.2     YES manual up                    up
GigabitEthernet0/2     unassigned      YES unset  up                    up

CORE-SW# show vlan brief
VLAN Name                             Status    Ports
10   MANAGEMENT                       active    Gi0/2
20   WORKSTATIONS                     active    Gi0/2

CORE-SW# show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Gi0/2       on           802.1q         trunking      1
```

Section 9: Access Switch Verification

```
ACCESS-SW# show vlan brief
VLAN Name                             Status    Ports
```

```
10   MANAGEMENT                       active
20   WORKSTATIONS                     active    Gi0/2, Gi0/3

ACCESS-SW# show interfaces status
Port      Name      Status     Vlan     Duplex  Speed Type
Gi0/1               connected  trunk    a-full  a-1000 10/100/1000BaseTX
Gi0/2               connected  20       a-full  a-1000 10/100/1000BaseTX
Gi0/3               connected  20       a-full  a-1000 10/100/1000BaseTX
```

Section 10: Router Verification

```
ROUTER# show ip interface brief
Interface              IP-Address      OK? Method Status                Protocol
GigabitEthernet0/0/0   100.65.22.4     YES DHCP   up                    up
GigabitEthernet0/0/1   192.168.1.1     YES manual up                    up

ROUTER# show ip route
Gateway of last resort is 100.65.22.1 to network 0.0.0.0
S* 0.0.0.0/0 [1/0] via 100.65.22.1
C  192.168.1.0/24 is directly connected, GigabitEthernet0/0/1
```

Section 11: PC Verification

```
C:\> ping 192.168.20.11
Reply from 192.168.20.11: bytes=32 time<1ms TTL=128

C:\> ping 192.168.10.1
Reply from 192.168.10.1: bytes=32 time<1ms TTL=255

C:\> tracert 8.8.8.8
Tracing route to 8.8.8.8
1    1 ms   1 ms   1 ms  192.168.20.1
2   15 ms  14 ms  16 ms  100.65.22.1
3   21 ms  23 ms  20 ms  8.8.8.8
Trace complete.
```