CCNA Lab Workbook: Basic Device Governance & Connectivity

Topology: `csr-iol-star` (R1, R2, and SW)

Module 1: The Foundation (Hex & Identity)

Before configuring, remember that IPv6 uses **Hexadecimal** (0-9, A-F). One hex character represents 4 bits.

Task 1.1: Global Configurations

On **R1, R2, and SW**, configure the basic identity and security.

1. **Hostname:** Identifies the device in the CLI.
2. **Banner:** Provides a legal "Unauthorized Access" warning.
3. **Password Security:** Encrypts all plaintext passwords.

Commands:

Bash
```
Router(config)# hostname R1
R1(config)# banner motd #Authorized Access Only!#
R1(config)# service password-encryption
R1(config)# enable secret cisco123
```

Verification: Ensure the prompt displays the correct hostname.

Module 2: Management Access (Console & SSH)
Task 2.1: Local Console Access

Ensure the physical console port is secured.

Bash
```
R1(config)# line console 0
R1(config-line)# password cisco
R1(config-line)# login
R1(config-line)# logging synchronous
```

Task 2.2: Secure Shell (SSH)

SSH provides encrypted remote management (replacing Telnet).

1. **Domain Name:** Required for key generation.
2. **RSA Key:** The "lock" for the encryption.
3. **Local User:** The credentials used to log in.

Commands:

Bash
```
R1(config)# ip domain-name star.lab
R1(config)# crypto key generate rsa  (Choose 1024)
R1(config)# username ccna_admin privilege 15 secret cisco_ssh
R1(config)# line vty 0 4
R1(config-line)# transport input ssh
R1(config-line)# login local
```

Module 3: Interface Addressing (Dual-Stack)

IPv6 interfaces require `ipv6 unicast-routing` to be enabled globally.

Task 3.1: Manual IPv4 & IPv6

Commands (R1 eth1):

Bash
```
R1(config)# ipv6 unicast-routing
R1(config)# interface eth1
R1(config-if)# ip address 172.16.1.1 255.255.255.0
R1(config-if)# ipv6 address 2001:db8:acad:1::1/64
R1(config-if)# no shutdown
```

Task 3.2: Modified EUI-64 (The "7th Bit" Flip)

Instead of typing the whole IPv6 address, the router can use its MAC address.

1. **Take MAC:** (e.g., `0011.2233.4455`)
2. **Flip 7th bit:** `00` (binary `00000000`) becomes `02` (binary `00000010`).
3. **Insert FFFE:** `0211:22FF:FE33:4455`.

Commands (R1 eth2):

Bash
```
R1(config-if)# interface eth2
R1(config-if)# ipv6 address 2001:db8:acad:12::/64 eui-64
```

Module 4: Verification & Troubleshooting

Use these commands to verify your work:

- `show ip interface brief`: Check if IPv4 is "up/up".
- `show ipv6 interface brief`: Check global and link-local addresses.

- `show ipv6 neighbors`: The IPv6 version of the ARP table.

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