

**Hardware Networking**

**Infrastructure Security and WAN Technologies**

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**1. Port Security Configuration**

**Configuration Provided:**

interface range gigabit Ethernet 0/1 - 24

switchport mode access

switchport port-security

switchport port-security mac-address sticky

**Effect of the Configuration (Choose Two)**

1. **Prevents unknown devices with unknown MAC addresses from sending data through the switch ports.**
2. **If a user connects a switch to the cable, prevents multiple devices from sending data through the port.**

**Explanation:**

* *switchport mode access* → Forces the port into access mode (no trunking).
* *switchport port-security* → Enables port security.
* *switchport port-security mac-address sticky* → Learns and stores the first MAC address dynamically and restricts the port to that MAC.

**2. Administrative Distance of Internal EIGRP**

**90**

| **Protocol** | **Administrative Distance** |
| --- | --- |
| Connected | 0 |
| Static Route | 1 |
| Internal EIGRP | **90** |
| External EIGRP | 170 |
| OSPF | 110 |
| RIP | 120 |

**Explanation:**

* Administrative Distance (AD) defines the trust level of a routing protocol.
* Lower AD means higher priority.
* Internal EIGRP routes have an AD of **90**, while external EIGRP routes have **170**.

**3. Binary 1s in a Subnet Mask Represent**

**Answer:** **The network portion of an associated address.**

**Example:**  
Subnet Mask: **255.255.255.0** → Binary: **11111111.11111111.11111111.00000000**

* **1s indicate the network portion.**
* **0s indicate the host portion.**

**4. STP Root Bridge Selection**

**Answer:** **32768: 11-22-33-44-55-66**

**Explanation:**

* The **root bridge** is selected based on the **lowest Bridge ID**.
* Bridge ID = **Priority (default 32768) + MAC address**.
* The lowest Bridge ID wins.

**5. Device Used for WAN Services**

**Answer:** **CSU/DSU (Channel Service Unit/Data Service Unit)**

**Explanation:**

* **CSU/DSU** converts digital signals for WAN transmission.
* **Router** is used for local network routing, but it requires a CSU/DSU to connect to a service provider.

**6. Display Addresses Assigned by DHCP Server**

**Answer:** **show ip dhcp bindings**

**Explanation:**

* **show ip dhcp bindings** → Displays a list of IP addresses assigned to clients.
* **show ip dhcp pool** → Displays DHCP pool statistics, not bindings.

**7. Enable EIGRP on Specific Interfaces**

**Answer:** **network 10.1.1.0 0.0.0.63**

| **Command** | **Explanation** |
| --- | --- |
| network 10.1.1.0 0.0.0.63 | Enables EIGRP on the range 10.1.1.0 to 10.1.1.63 |
| network 10.1.1.0/63 | Incorrect notation (should be wildcard mask) |

**8. Advertise OSPFv3 Default Route**

**Answer:** **Have R3 use the command default-information originate always in OSPFv3 router configuration mode.**

**Explanation:**

* default-information originate → Advertises a default route if it exists.
* default-information originate always → Forces advertisement, even if the default route is missing.

**9. Verify NAT Interfaces**

**Answer:** **show ip nat statistics**

| **Command** | **Function** |
| --- | --- |
| show ip nat translations | Displays active NAT translations |
| show ip nat statistics | Shows interface roles and translation statistics |

**10. 'u' Flag in EtherChannel Summary**

**Answer:** **Unsuitable for bundling**

| **Flag** | **Meaning** |
| --- | --- |
| D | Down |
| S | Suspended |
| U | Unsuitable for bundling |

**11. Encrypt Passwords**

**Answer:** **service password-encryption**

**Explanation:**

* enable secret → Encrypts only enable mode passwords.
* service password-encryption → Encrypts all passwords in the configuration file.

**12. DHCP Pool IPv4 Addresses**

**Answer:** **network**

| **Command** | **Function** |
| --- | --- |
| network | Defines the pool of assignable addresses |
| dns-server | Specifies the DNS server for clients |

**13. ACL Processing on Router Interfaces**

**Answer:** **Inbound ACLs are processed before routing table lookup.**  
**Answer:** **Outbound ACLs are processed after routing table lookup.**

**14. OSPFv2 Issues**

**Answer:** **An ACL could be blocking router advertisements.**  
**Answer:** **Physical layer issues preventing neighbors from pinging each other.**

**15. Neighbor Discovery in IPv6**

**Answer:** **Determines the link layer address of a neighbor.**  
**Answer:** **Queries for duplicate addresses.**

| **Function** | **Description** |
| --- | --- |
| ND | IPv6 equivalent of ARP |
| DAD | Detects duplicate addresses |

**16. IPv6 Prefix for Enterprise Network**

**Answer:** **/48**

**Explanation:**

* /48 is commonly assigned to enterprises by ISPs.
* /64 is used for individual subnets.

**17. Remote Switch Access**

**Answer:** **Configure a gateway for the switch.**

**Steps:**

1. Assign an IP address to a VLAN.
2. Set a default gateway.

interface vlan 1

ip address 192.168.1.1 255.255.255.0

ip default-gateway 192.168.1.254

**18. Network Redundancy Design**

**Answer:** **Spanning-tree will need to be used.**  
**Answer:** **The connection between switches should be a trunk.**

| **Design Issue** | **Solution** |
| --- | --- |
| Switching loops | Use STP |
| VLAN Communication | Use Trunk Links |