Cheat Sheet for comprehensive Cisco Certified Network Professional (CCNP) - Enterprise

Core Concepts

- **Enterprise Infrastructure**:
  - **Core Components**:
    - **Routers**: Edge devices for WAN connectivity.
    - **Switches**: Layer 2/3 devices for LAN connectivity.
    - **Firewalls**: Security appliances for network segmentation.
  - **Network Topologies**:
    - **Hub-and-Spoke**: Centralized control with distributed endpoints.
    - **Full Mesh**: Direct connections between all nodes.
    - **Partial Mesh**: Combination of direct and indirect connections.
- **Enterprise Automation**:
  - **Ansible**:
    - **Inventory**: `ansible-inventory --list`
    - **Playbooks**: `ansible-playbook playbook.yml`
  - **Python for Network Automation**:
    - **Netmiko**: `from netmiko import ConnectHandler`
    - **NAPALM**: `from napalm import get_network_driver`

Routing Protocols

- **OSPF (Open Shortest Path First)**:
  - **Configuration**:

```
router ospf 1
network 192.168.1.0 0.0.0.255 area 0
```

- **Verification**:

```
show ip ospf neighbor
show ip ospf database
```

- **EIGRP (Enhanced Interior Gateway Routing Protocol)**:

- **Configuration**:

```
router eigrp 1
network 192.168.1.0 0.0.0.255
```

- **Verification**:

```
show ip eigrp neighbors
show ip eigrp topology
```

- **BGP (Border Gateway Protocol)**:

- **Configuration**:

```
router bgp 65001
neighbor 192.168.1.2 remote-as 65002
```

- **Verification**:

```
show ip bgp summary
show ip bgp neighbors
```

Switching Technologies

- **VLANs (Virtual LANs)**:

- **Configuration**:

```
vlan 10
name Sales
interface range g0/1 - 2
switchport mode access
switchport access vlan 10
```

- **Verification**:

```
show vlan brief
show interfaces switchport
```

- **Trunking**:

- **Configuration**:

```
interface g0/1
switchport mode trunk
switchport trunk allowed vlan 10,20
```

- **Verification**:

```
show interfaces trunk
```

- **STP (Spanning Tree Protocol)**:

- **Configuration**:

```
spanning-tree mode rapid-pvst
spanning-tree vlan 10 priority 4096
```

- **Verification**:

```
show spanning-tree
```

High Availability

- **HSRP (Hot Standby Router Protocol)**:

- **Configuration**:

```
interface g0/1
standby 1 ip 192.168.1.254
standby 1 priority 110
standby 1 preempt
```

- **Verification**:

```
show standby brief
```

- **VRRP (Virtual Router Redundancy Protocol)**:

  - **Configuration**:

```
interface g0/1
vrrp 1 ip 192.168.1.254
vrrp 1 priority 110
vrrp 1 preempt
```

  - **Verification**:

```
show vrrp brief
```

Security

- **Access Control Lists (ACLs)**:

  - **Standard ACL**:

```
access-list 1 permit 192.168.1.0 0.0.0.255
```

  - **Extended ACL**:

```
access-list 100 permit tcp any host 192.168.1.1 eq 80
```

  - **Application**:

```
interface g0/1
ip access-group 100 in
```

- **Firewall Policies**:

  - **Zone-Based Policy Firewall**:

```
policy-map type inspect ZBF
class type inspect class-default
inspect
zone security WEB
```

```
zone security DB
zone-pair security WEB-DB source WEB destination DB
service-policy type inspect ZBF
```

- **Verification**:

```
show policy-map type inspect zone-pair sessions
```

Quality of Service (QoS)

- **Classification and Marking**:

- **Configuration**:

```
class-map match-all VOICE
match access-group name VOICE_ACL
policy-map QOS
class VOICE
priority level 1
```

- **Application**:

```
interface g0/1
service-policy output QOS
```

- **Verification**:

```
show policy-map interface g0/1
```

Network Management

- **SNMP (Simple Network Management Protocol)**:

- **Configuration**:

```
snmp-server community public RO
snmp-server host 192.168.1.2 version 2c public
```

- **Verification**:

```
show snmp community
show snmp host
```

- **Syslog**:
  - **Configuration**:

```
logging host 192.168.1.2
logging trap informational
```

  - **Verification**:

```
show logging
```

Troubleshooting

- **Common Commands**:
  - **Ping**: `ping 192.168.1.1`
  - **Traceroute**: `traceroute 192.168.1.1`
  - **Show Commands**:

```
show ip interface brief
show running-config
show version
```

- **Troubleshooting Steps**:
  - **Physical Layer**: Check cables, ports, and LEDs.
  - **Data Link Layer**: Verify VLANs, trunking, and STP.
  - **Network Layer**: Check IP addressing, routing tables, and routing protocols.
  - **Transport Layer**: Ensure proper TCP/UDP ports are open.
  - **Application Layer**: Verify application-specific configurations and logs.

Best Practices

- **Documentation**:

- **Network Diagrams**: Updated and detailed.
- **Configuration Backups**: Regularly backed up and stored securely.

- **Security**:
  - **Strong Passwords**: Use complex passwords and enable password encryption.
  - **Access Control**: Limit access to critical devices and use role-based access control (RBAC).

- **Performance**:
  - **Monitoring**: Use tools like Cisco Prime or SolarWinds for continuous monitoring.
  - **Optimization**: Regularly review and optimize network configurations for performance.

Examples

- **Example: Configuring a Basic Router**:

```
hostname R1
interface g0/0
ip address 192.168.1.1 255.255.255.0
no shutdown
```

- **Example: Configuring a Basic Switch**:

```
hostname SW1
vlan 10
name Sales
interface g0/1
switchport mode access
switchport access vlan 10
```

Shortcuts and Tips

- **CLI Shortcuts**:
  - **Tab Completion**: Use `Tab` for command completion.
  - **History**: Use `Ctrl+P` or `Up Arrow` to recall previous commands.
  - **Abbreviations**: Use minimal command abbreviations (e.g., `sh` for `show`).

- **Configuration Tips**:

- **Copy Running-Config to Startup-Config**: `copy running-config startup-config`
- **Save Configuration**: `write memory`

- **Troubleshooting Tips**:
  - **Check Interface Status**: `show ip interface brief`
  - **Verify Routing Table**: `show ip route`
  - **Check ARP Table**: `show ip arp`

Conclusion

This cheat sheet provides a comprehensive overview of essential concepts, configurations, and troubleshooting techniques for the Cisco Certified Network Professional (CCNP) - Enterprise certification. Use this as a quick reference to navigate through complex network scenarios and configurations effectively.

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