Cheat Sheet for comprehensive Cisco Certified Architect (CCAr)

Network Design and Architecture

Core Principles

- Scalability: Design for future growth with modularity and redundancy.
- **Redundancy**: Implement redundant paths and components to ensure high availability.
- **Security**: Integrate security at every layer of the network.
- **Performance**: Optimize for low latency and high throughput.

Design Models

- Hub-and-Spoke: Centralized control with distributed endpoints.
- **Full Mesh**: Direct connections between all nodes for high redundancy.
- **Hybrid**: Combination of Hub-and-Spoke and Full Mesh.

Cisco IOS Commands

Basic Configuration

- Enable Mode: `enable`
- Global Configuration: `configure terminal`
- Interface Configuration: `interface <type><number>`
- Save Configuration: `write memory` or `copy running-config startup-config`

Advanced Configuration

- VLAN Configuration:

```
vlan <vlan-id>
name <vlan-name>
```

- Routing Protocols:
- OSPF:

```
router ospf <process-id>
network <network-address> <wildcard-mask> area <area-id>
```

- **BGP**:

```
router bgp <as-number>
neighbor <ip-address> remote-as <as-number>
```

Security Features

AAA (Authentication, Authorization, Accounting)

- TACACS+:

aaa new-model aaa authentication login default group tacacs+ local aaa authorization exec default group tacacs+ local aaa accounting exec default start-stop group tacacs+

- RADIUS:

```
aaa new-model
aaa authentication login default group radius local
aaa authorization exec default group radius local
aaa accounting exec default start-stop group radius
```

Firewall and Intrusion Prevention

- Cisco ASA:

```
access-list <acl-number> permit <protocol> <source> <destination>
access-group <acl-number> in interface <interface-name>
```

- Cisco Firepower:

- Policy Creation: Use Firepower Management Center to create and deploy policies.
- Intrusion Policies: Configure intrusion policies based on threat intelligence.

High Availability and Redundancy

HSRP (Hot Standby Router Protocol)

- Configuration:

```
interface <interface-name>
standby <group-number> ip <virtual-ip>
```

```
standby <group-number> priority <priority-value>
standby <group-number> preempt
```

VRRP (Virtual Router Redundancy Protocol)

- Configuration:

```
interface <interface-name>
vrrp <group-number> ip <virtual-ip>
vrrp <group-number> priority <priority-value>
vrrp <group-number> preempt
```

Quality of Service (QoS)

Classification and Marking

- Class-Map:

```
class-map <class-name>
match access-group <acl-number>
```

- Policy-Map:

```
policy-map <policy-name>
class <class-name>
set dscp <dscp-value>
```

Queuing and Scheduling

- Priority Queuing:

```
priority level <level>
bandwidth <bandwidth-value>
```

- Weighted Fair Queuing:

fair-queue

Network Automation and Programmability

Ansible for Cisco

- Playbook Example:

```
- name: Configure Cisco Router
hosts: routers
tasks:
    - name: Enable OSPF
    ios_config:
        lines:
            - router ospf 1
                 - network 192.168.1.0 0.0.0.255 area 0
```

Python for Network Automation

- Netmiko Example:

```
from netmiko import ConnectHandler

device = {
    'device_type': 'cisco_ios',
    'host': '192.168.1.1',
    'username': 'admin',
    'password': 'password'
}

connection = ConnectHandler(**device)
output = connection.send_command('show ip interface brief')
print(output)
```

Troubleshooting and Monitoring

Common Commands

- Show Commands:
- `show running-config`
- `show interfaces`
- `show ip route`
- `show ip protocols`
- `show access-lists`

Logging and Monitoring

- Syslog Configuration:

```
logging <syslog-server-ip>
logging trap <severity-level>
```

- SNMP Configuration:

```
snmp-server community <community-string> ro
snmp-server host <host-ip> version 2c <community-string>
```

Best Practices

Documentation

- Network Diagrams: Use tools like Cisco Modeling Labs or Visio.
- **Configuration Backups**: Regularly backup configurations to a secure location.

Continuous Learning

- **Cisco Learning Network**: Regularly visit for updates and new technologies.
- **Cisco Live**: Attend events for hands-on experience and networking.

Tools and Resources

Cisco Tools

- Cisco DNA Center: Centralized management for Cisco SD-Access.
- **Cisco Prime Infrastructure**: Network management and monitoring.
- **Cisco Modeling Labs**: Virtual lab environment for network simulation.

Community and Support

- Cisco Support Community: Forums for troubleshooting and sharing knowledge.
- **Cisco TAC**: Technical Assistance Center for direct support.

Conclusion

- **Continuous Improvement**: Regularly review and update network designs and configurations.

- **Stay Updated**: Keep abreast of new Cisco technologies and certifications.

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