

# Cheat Sheet for comprehensive Cisco Certified Network Associate (CCNA)

## - Data Center

### Data Center Overview

#### - Data Center Components:

- **Servers:** Compute resources
- **Storage:** Persistent data storage
- **Networking:** Connectivity and data transfer
- **Virtualization:** Resource pooling and abstraction
- **Management:** Monitoring and control systems

#### - Data Center Types:

- **Enterprise Data Centers:** Owned by organizations
- **Cloud Data Centers:** Managed by cloud service providers
- **Colocation Data Centers:** Rented space and resources

### Cisco Unified Computing System (UCS)

#### - UCS Components:

- **UCS Manager:** Centralized management interface
- **UCS Fabric Interconnects:** Network and storage connectivity
- **UCS Servers:** Compute nodes
- **UCS Chassis:** Physical enclosure for servers
- **UCS Storage:** SAN and NAS storage options

#### - UCS Manager Commands:

- **Login:** ``connect local``
- **Show Commands:**
  - ``show fabric-interconnect``
  - ``show server``
  - ``show service-profile``

- **Configuration Commands:**

- ``config fabric-interconnect``
- ``config server``
- ``config service-profile``

**Virtualization in Data Centers**

- **Virtualization Technologies:**

- **Hypervisors:**

- **Type 1:** Bare-metal (e.g., VMware ESXi, Hyper-V)
- **Type 2:** Hosted (e.g., VMware Workstation, VirtualBox)
- **Containers:** Lightweight virtualization (e.g., Docker, Kubernetes)

- **VMware vSphere:**

- **Components:**

- **vCenter Server:** Centralized management
- **ESXi Hosts:** Hypervisor instances
- **Datastores:** Storage for VMs
- **Networks:** VM networking

- **vSphere Commands:**

- **Power On VM:** ``Start-VM -VM $vm``
- **Power Off VM:** ``Stop-VM -VM $vm``
- **Create VM:** ``New-VM -Name $vmName -Template $template``

**Data Center Networking**

- **Networking Protocols:**

- **Ethernet:** Standard LAN protocol
- **FC (Fibre Channel):** High-speed storage networking
- **FCoE (Fibre Channel over Ethernet):** Converged network
- **iSCSI:** IP-based storage networking

## - Cisco Nexus Switches:

### - Models:

- **Nexus 9000:** High-performance, modular
- **Nexus 7000:** Modular, high-density
- **Nexus 5000:** Fixed-configuration, high-performance

### - Configuration Commands:

- **Create VLAN:** `vlan \$vlanID`
- **Assign Interface to VLAN:** `interface \$interface`
  - `switchport mode access`
  - `switchport access vlan \$vlanID`
- **Configure LACP:** `interface port-channel \$portChannelID`
  - `channel-group \$groupID mode active`

## Storage in Data Centers

### - Storage Types:

- **Direct Attached Storage (DAS):** Directly connected to server
- **Network Attached Storage (NAS):** File-level storage over network
- **Storage Area Network (SAN):** Block-level storage over network

### - Cisco MDS Storage:

#### - Models:

- **MDS 9000:** High-performance, modular
- **MDS 9100:** Fixed-configuration, high-density

#### - Configuration Commands:

- **Create Zone:** `zone name \$zoneName`
- **Add Members to Zone:** `member pwwn \$pwwn`
- **Activate Zone:** `zone commit`

## Data Center Management

### - Monitoring Tools:

- **Cisco Prime Data Center Network Manager (DCNM):** Network management
- **Cisco UCS Director:** Unified management for UCS
- **Cisco Intersight:** Cloud-based management for UCS

### - Management Commands:

#### - DCNM:

- **Login:** `https://dcnm-ip`

#### - Show Commands:

- `show fabric`
- `show device`

#### - Configuration Commands:

- `config fabric`
- `config device`

## Security in Data Centers

### - Security Measures:

- **Access Control:** Role-based access control (RBAC)
- **Encryption:** Data encryption at rest and in transit
- **Firewalls:** Network segmentation and protection
- **Intrusion Detection/Prevention:** Monitoring and response

### - Cisco Security Solutions:

- **Cisco Firepower:** Next-generation firewall
- **Cisco Stealthwatch:** Network traffic visibility
- **Cisco Identity Services Engine (ISE):** Policy-based access control

## Troubleshooting and Maintenance

### - Common Issues:

- **Network Connectivity:** Check interfaces, VLANs, and routing

- **Storage Access:** Verify zoning, LUN mapping, and permissions
- **Server Performance:** Monitor CPU, memory, and disk usage
- **Troubleshooting Commands:**
  - **Ping:** `ping \$destination`
  - **Traceroute:** `traceroute \$destination`
  - **Show Interface Status:** `show interface status`
  - **Show Logs:** `show logging`

### Best Practices

- **Design Principles:**
  - **Scalability:** Plan for future growth
  - **Redundancy:** Implement failover and backup solutions
  - **Automation:** Use scripts and tools for routine tasks
  - **Monitoring:** Continuous monitoring and alerting
- **Maintenance Tips:**
  - **Regular Updates:** Apply patches and updates
  - **Backup:** Regularly back up configurations and data
  - **Documentation:** Maintain detailed documentation

### Examples

- **Example: Configuring a VLAN on Nexus Switch:**

```
vlan 10
  name Sales
interface Ethernet1/1
  switchport mode access
  switchport access vlan 10
```

- **Example: Creating a Zone on MDS Switch:**

```
zone name Sales_Zone
  member pwnn 10:00:00:00:00:00:01
zone commit
```

- **Example: Powering On a VM in vSphere:**

```
Start-VM -VM "SalesVM"
```

**Summary**

- **Key Takeaways:**

- Understand data center components and types
- Master Cisco UCS and Nexus switch configurations
- Implement virtualization and storage solutions
- Ensure robust security and efficient management
- Follow best practices for troubleshooting and maintenance

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