

Cheat Sheet for comprehensive Cisco Certified Internetwork Expert (CCIE)

- Enterprise Wireless

Wireless LAN Controllers (WLC)

Basic Configuration

- Initial Setup:

- `config t`
- `wlan <wlan-id> <profile-name> <ssid>`
- `interface wlan <wlan-id>`
- `description <description>`
- `ssid <ssid>`
- `no shutdown`

- Security Settings:

- WPA2 Enterprise:

- `dot11 wpa akm dot1x`
- `dot11 wpa wpa2 ciphers aes`

- WPA2 Personal:

- `dot11 wpa akm psk`
- `dot11 wpa wpa2 ciphers aes`
- `dot11 wpa wpa2 psk ascii <passphrase>`

- Advanced Features:

- Load Balancing:

- `config advanced 802.11a load-balancing enable`
- `config advanced 802.11b load-balancing enable`

- RF Profiles:

- `config rf-profile create <profile-name> <band>`
- `config rf-profile channel <profile-name> <channel>`

Access Points (APs)

Basic Configuration

- Initial Setup:

- `config ap <ap-name> country <country-code>`
- `config ap <ap-name> ip address <ip-address> <subnet-mask>`
- `config ap <ap-name> name <new-name>`

- **Advanced Features:**

- **RF Profiles:**

- `config ap rf-profile <ap-name> <profile-name>`

- **Mobility Groups:**

- `config ap mobility-group <ap-name> <group-name>`

Mobility and RF Management

Mobility Groups

- **Create Mobility Group:**

- `config mobility group create <group-name>`
- `config mobility group add <group-name> <ap-name>`

- **RF Profiles:**

- **Create RF Profile:**

- `config rf-profile create <profile-name> <band>`

- **Assign RF Profile:**

- `config ap rf-profile <ap-name> <profile-name>`

Security

AAA Configuration

- **Local Authentication:**

- `config aaa local-authentication`
- `config aaa local-authentication username <username> password <password>`

- **RADIUS Configuration:**

- `config aaa radius server <server-name> <ip-address>`
- `config aaa radius key <key>`
- `config aaa radius port <port>`

Advanced Security Features

- **WPA2 Enterprise:**

- **802.1X:**

- `dot11 wpa akm dot1x`
- `dot11 wpa wpa2 ciphers aes`

- **EAP Methods:**

- `config eap method <method-name>`
- `config eap method <method-name> type <type>`

Troubleshooting

Common Commands

- **Show Commands:**

- `show ap summary`
- `show ap detail <ap-name>`
- `show wlan summary`
- `show wlan detail <wlan-id>`
- `show dot11 associations`
- `show dot11 clients`

- **Debug Commands:**

- `debug dot11 errors`
- `debug dot11 events`
- `debug dot11 packets`

Troubleshooting Tips

- **AP Not Joining:**

- Check IP address and subnet mask.
- Verify country code and regulatory domain.
- Ensure correct mobility group and RF profile.

- **Client Connectivity Issues:**

- Check SSID broadcast and security settings.
- Verify RADIUS server connectivity and credentials.
- Use `debug dot11 errors` and `debug dot11 events` for detailed logs.

Performance Optimization

RF Optimization

- **Channel Assignment:**

- `config rf-profile channel <profile-name> <channel>`

- `config rf-profile tx-power <profile-name> <power>`

- **Load Balancing:**

- `config advanced 802.11a load-balancing enable`
- `config advanced 802.11b load-balancing enable`

QoS Configuration

- **Class Maps:**

- `config qos class-map <class-map-name>`
- `config qos class-map match <class-map-name> <match-type> <match-value>`

- **Policy Maps:**

- `config qos policy-map <policy-map-name>`
- `config qos policy-map class <policy-map-name> <class-map-name>`
- `config qos policy-map action <policy-map-name> <action>`

Advanced Features

FlexConnect

- **Enable FlexConnect:**

- `config ap mode flexconnect <ap-name>`
- `config ap flexconnect group <ap-name> <group-name>`

- **Local Switching:**

- `config ap flexconnect local-switching <ap-name>`
- `config ap flexconnect local-switching vlan <ap-name> <vlan-id>`

Mesh Networking

- **Enable Mesh:**

- `config mesh enable`
- `config mesh group create <group-name>`
- `config mesh group add <group-name> <ap-name>`

- **Mesh Profile:**

- `config mesh profile create <profile-name>`
- `config mesh profile channel <profile-name> <channel>`
- `config mesh profile tx-power <profile-name> <power>`

Backup and Restore

Backup Configuration

- Backup to TFTP:

- `copy running-config tftp://<tftp-server-ip>/<filename>`

- Backup to USB:

- `copy running-config usbflash0:/<filename>`

Restore Configuration

- Restore from TFTP:

- `copy tftp://<tftp-server-ip>/<filename> running-config`

- Restore from USB:

- `copy usbflash0:/<filename> running-config`

Best Practices

Deployment Tips

- AP Placement:

- Ensure even coverage with minimal overlap.
- Use RF profiles to optimize channel and power settings.

- Security Best Practices:

- Use WPA2 Enterprise with 802.1X for maximum security.
- Regularly update RADIUS server credentials and keys.

- Performance Monitoring:

- Regularly monitor AP and client statistics.
- Use `show dot11 associations` and `show dot11 clients` for real-time data.

Examples

Example: Configuring a WLAN with WPA2 Enterprise

```
config t
wlan 1 "Corporate-WLAN" "Corporate-SSID"
interface wlan 1
description "Corporate WLAN"
ssid "Corporate-SSID"
dot11 wpa akm dot1x
```

```
dot11 wpa wpa2 ciphers aes
no shutdown
```

Example: Troubleshooting AP Not Joining

```
show ap summary
show ap detail <ap-name>
debug dot11 errors
debug dot11 events
```

Summary

- **WLC and AP Configuration:** Basic and advanced settings for WLC and APs.
- **Security:** AAA, RADIUS, and advanced security features.
- **Troubleshooting:** Common commands and tips for resolving issues.
- **Performance Optimization:** RF and QoS configurations.
- **Advanced Features:** FlexConnect and Mesh networking.
- **Backup and Restore:** Configuration backup and restoration methods.
- **Best Practices:** Deployment and security tips.

This cheat sheet provides a comprehensive guide to essential features, shortcuts, tips, and tricks for Cisco Certified Internetwork Expert (CCIE) - Enterprise Wireless. Use it as a quick reference for configuring, troubleshooting, and optimizing your wireless network.

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