



# Configuring AirTime Fairness

- [Information About Air Time Fairness, on page 1](#)
- [Configure, View, and Modify AirTime Fairness, on page 3](#)

## Information About Air Time Fairness

Cisco Air Time Fairness (ATF) for Cisco High Density Experience (HDX) functions as a wireless quality of service (QoS) that regulates the downlink air time. It allows network administrators to create and apply policies to enable some groups to receive traffic from a WLAN more frequently than other groups.

Cisco ATF has the following capabilities:

- Allocates Wi-Fi air time for user groups or device categories.
- Cisco ATF is defined by the network administrator, and not by the network.
- Provides a simplified mechanism for allocating air time.
- Dynamically adapts to changing conditions in a WLAN.
- Enables a more efficient fulfillment of service-level agreements.
- Augments standards-based Wi-Fi QoS mechanisms.

By enabling network administrators to define what fairness means within their environments with regard to the amount of on air time per client group, the amount of traffic is also controlled.

Policies are created to allow, prevent, and prioritize data packets in a network. All the policies that are created must have a weight value that denotes the importance of that policy in the network. You can assign a weight value in the range of 5 to 100. If no policy is assigned to a WLAN, the system will assign the default policy (policy ID 0) with a weight value of 10 to it. The weight value impacts the percentage of air-time assigned to a policy. The air time percentage is calculated by the system without any user intervention. Therefore, air time percentages will automatically change when a WLAN and a policy are added or removed from a network.



**Note** When percentages change, the changed values might not be optimal for the new traffic.

For example, if there are three WLANs with policy values of 5, 10, and 35 in a network, the calculations for the air time percentage for weight value 5 is 10%, and for weight values of 10 and 35, it is 20% and 70% air

time respectively. If you add a new policy of weight 15, the system recalculates the air time percentages as 7.7%, 15.38%, 23.07%, and 53.84%, or 5, 10, 15, 35 weight values respectively.

Cisco ATF has three modes, that can be subdivided into three levels per mode, thus providing flexibility in the configuration. The three modes are:

- **Disable mode**—ATF is disabled in a Cisco WLC. The default option is **Disable**.
- **Monitor mode**—Users can perform the following actions:
  - View the air time
  - Report air time usage for all AP transmissions
  - View reports
    - Per SSID/WLAN
    - Per AP Group
    - Per AP
  - Report air time usage at periodic intervals
  - Block ACKs are not reported
  - Enforcement disabled as part of Monitor mode
- **Enforce-policy mode**—Users can perform the following functions:
  - Enforce air time based on configured policy
  - Enforce air time on
    - A WLAN
    - All APs connected within a Cisco WLC's network
    - An AP group
    - An AP
  - **Strict Enforcement per WLAN**—Air time used by the WLANs on a radio will be strictly enforced up to the configured limits in the policies.
  - **Optimal Enforcement per WLAN**—Share unused Air time from other SSIDs that are not using their allocated air time.



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**Note** AP group Global configuration and per AP level Privileged EXEC commands are allowed to override a policy applied on a WLAN and air time fairness mode applied at the radio level.

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# Configure, View, and Modify AirTime Fairness

## Configuring Cisco Air Time Fairness (CLI)

The Cisco Air Time Fairness (ATF) feature can be configured using the following CLIs:

- Enable Cisco ATF in the Enforce policy mode or Monitor mode by entering this command:

```
ap dot11 {24ghz | 5ghz} airtime-fairness mode {enforce-policy | monitor}
```

- Disable Cisco ATF in the Enforce policy mode or Monitor mode by entering this command:

```
no ap dot11 {24ghz | 5ghz} airtime-fairness mode {enforce-policy | monitor}
```

- Create a new ATF policy and apply policy weight by entering this command:

1. **controller#configure terminal**
2. **controller(config)# ap dot11 airtime-fairness policy-name *policy-name policy-id***
3. **controller(config-airtime-fairness policy)# policy-weight *policy-weight***

The range for a policy weight is between 05 and 100. The default value of 10 is applied if no policy is applied to the corresponding WLAN.

- Delete a policy by entering this command:

```
no ap dot11 airtime-fairness policy-name policy-name
```

- Configure a Cisco ATF policy for a WLAN by using these commands:

1. **controller#configure terminal**
2. **controller(config)# wlan *wlan-name***
3. **controller(config-wlan)# airtime-fairness policy *policy-name***

- Configure Cisco ATF mode for an AP group by using these commands:

1. **controller#configure terminal**
2. **controller(config)# ap group *apgroup-name***
3. **controller(config-apgroup)# no airtime-fairness dot11 {24ghz | 5ghz} mode {enforce-policy | monitor}**

- Configure Cisco ATF optimization for an AP group by using these commands:

1. **controller#configure terminal**
2. **controller(config)# ap group *apgroup-name***
3. **controller(config-apgroup)# no airtime-fairness dot11 {24ghz | 5ghz} optimization**

- Configure applied policy override on a WLAN through an AP-specific WLAN list by using these commands:

1. **controller#configure terminal**
2. **controller(config)# ap group *apgroup-name***
3. **controller(config-apgroup)# wlan *wlan-name***
4. **controller(config-wlan-apgroup)# no airtime-fairness dot11 {24ghz | 5ghz} policy *policy-name***

- Configure a Cisco ATF policy for a WLAN by using these commands:

1. **controller# configure terminal**
  2. **controller(config)# wlan *wlan-name***
  3. **controller(config-wlan)# airtime-fairness policy *policy-name***
- Clear wireless ATF statistics by entering this command:
    1. **controller# clear wireless airtime-fairness statistics**

## Viewing Cisco Air Time Fairness (CLI)

Cisco Air Time Fairness (ATF) feature configurations can be viewed using the following CLIs:

- View all the configured policies by entering this command:
 

```
show ap airtime-fairness policy
```
- View the list of configured WLANs, and the ATF policy applied by entering this command:
 

```
show ap airtime-fairness wlan
```
- View the ATF configuration for a specific AP group by entering this command:
 

```
show ap airtime-fairness ap-group group-name
```
- View the AP list with ATF configuration per radio by entering this command:
 

```
show ap airtime-fairness
```
- View the AP list with ATF configured for 2.4-GHz and 5-GHz radio by entering this command:
 

```
show ap dot11 {24ghz | 5ghz} airtime-fairness
```
- View ATF configuration for a specific AP
 

```
show ap name ap-name airtime-fairness
```
- View statistics for specified ATF policy
 

```
show ap name ap-name dot11 {24ghz | 5ghz} airtime-fairness policy policy-name statistics
```
- View ATF statistics for a specified WLAN active on specific AP
 

```
show ap name ap-name dot11 {24ghz | 5ghz} airtime-fairness wlan name wlan-name statistics
```
- View ATF statistics per WLAN
 

```
show ap name ap-name dot11 {24ghz | 5ghz} airtime-fairness summary
```

## Modifying AirTime Fairness Parameters for AP(CLI)

The following commands allows modification of specific AP ATF parameters. The user can enable, disable, change, or override ATF policy per AP using these commands

- Enable ATF in enforce-policy or monitor mode for a specific AP
 

```
ap name ap-name dot11 {24ghz | 5ghz} airtime-fairness mode {enforce-policy | monitor}
```
- Disable ATF in enforce-policy or monitor mode for a specific AP

**ap name** *ap-name* **no dot11** {24ghz | 5ghz} **airtime-fairness mode** {enforce-policy | monitor}

- Enable ATF optimization for a specific AP

**ap name** *ap-name* **dot11** {24ghz | 5ghz} **airtime-fairness optimization**

- Disable ATF optimization for a specific AP

**ap name** *ap-name* **no dot11** {24ghz | 5ghz} **airtime-fairness optimization**

- Override the policy on WLAN specific to one AP

**ap name** *ap-name* **dot11** {24ghz | 5ghz} **airtime-fairness wlan-name** *wlan-name* **policy-name** *policy-name*

- Disable the ATF policy override on the WLAN specific to WLAN

**ap name** *ap-name* **no dot11** {24ghz | 5ghz} **airtime-fairness wlan-name** *wlan-name*

