



## AP Group NTP Server

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## Feature History for AP Group NTP Server

This table provides release and related information for the feature explained in this module.

This feature is available in all the releases subsequent to the one in which it is introduced in, unless noted otherwise.

**Table 1: Feature History for AP Group NTP Server**

Release	Feature	Feature Information
Cisco IOS XE Bengaluru 17.6.1	AP Group NTP Server	From this release, the global NTP server configuration is replaced with the per-AP group NTP server configuration. Now, you cannot configure the Cisco Hyperlocation feature without the per-AP group NTP server.

## Information About AP Group NTP Server

Features such as Cisco Hyperlocation, BLE Angle of Arrival (AoA), and Intelligent Capture (iCAP) require precise time across APs within an AP group to achieve location accuracy. Because the controller and controller global NTP server are configured on the WAN, they might have large synchronization delays from the APs, and this might compromise location accuracy.

If all the APs in an AP group synchronize with the same NTP server, accurate data can be obtained to calculate the location. Configuring the NTP server locally for all the APs in an AP group helps achieve better synchronization among APs.

## Configuring an AP Group NTP Server

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>ap profile <i>profile-name</i></b> <b>Example:</b> Device(config)# ap profile <i>profile-name</i>	Configures an AP profile and enters AP profile configuration mode.
<b>Step 3</b>	<b>[no] ntp ip <i>ip-address</i></b> <b>Example:</b> Device(config-ap-profile)# [no] ntp ip 9.0.0.4	Sets the IP address of the NTP server. The <b>no</b> form of this command removes the NTP server.

## Configuring AP Timezone

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 2</b>	<b>ap profile <i>profile-name</i></b> <b>Example:</b> Device(config)# ap profile test	Configures the AP profile and enters AP profile configuration mode.
<b>Step 3</b>	<b>timezone {use-controller   delta hour <i>offset-hour</i> minute <i>offset-minute</i>}</b> <b>Example:</b> Device(config-ap-profile)# timezone delta hour -12 minute 2	Configures the timezone offset for AP.  You can configure the AP timezone only for each AP profile. You cannot configure timezone for each AP.  To configure the timezone, either apply the current controller timezone or the time difference. By default, timezone is disabled.

# Verifying Cisco Hyperlocation

To display the hyperlocation status values and parameters for all the AP profiles, use the following command:

```
Device# show ap hyperlocation summary

Profile Name: custom-profile

Hyperlocation operational status: Down
Reason: Hyperlocation is administratively disabled
Hyperlocation NTP server: 209.165.200.224
Hyperlocation admin status: Disabled
Hyperlocation detection threshold (dBm): -100
Hyperlocation trigger threshold: 10
Hyperlocation reset threshold: 8

Profile Name: default-ap-profile

Hyperlocation operational status: Up
Reason: N/A
Hyperlocation NTP server: 209.165.200.224
Hyperlocation admin status: Enabled
Hyperlocation detection threshold (dBm): -90
Hyperlocation trigger threshold: 22
Hyperlocation reset threshold: 8
```

To display both the overall and the per-AP configuration values and operational status, use the following command:

```
Device# show ap hyperlocation detail

Profile Name: house24

Hyperlocation operational status: Up
Reason: NTP server is not properly configured
Hyperlocation NTP server: 198.51.100.1
Hyperlocation admin status: Enabled
Hyperlocation detection threshold (dBm): -90
Hyperlocation trigger threshold: 8
Hyperlocation reset threshold: 7
```

AP Name	Radio MAC	Method	CMX IP	AP Profile
APe865.49d9.bfe0	e865.49ea.a4b0	WSM2+Ant	198.51.100.2	house24
APa89d.21b9.69d0	a89d.21b9.69d0	Local	198.51.100.3	house24
APe4aa.5d3f.d750	e4aa.5d5f.3630	WSM	198.51.100.4	house24

To display the overall (profile specific) configuration values and operational status for a given profile, use the following command:

```
Device# show ap profile profile-name hyperlocation summary

Profile Name: profile-name
Hyperlocation operational status: Up
Reason: N/A
Hyperlocation NTP server: 209.165.200.224
```

```
Hyperlocation admin status: Enabled
Hyperlocation detection threshold (dBm): -100
Hyperlocation trigger threshold: 10
Hyperlocation reset threshold: 8
```

To display both the overall (profile specific) and per-AP configuration values and operational status for a given profile, use the following command. The APs listed are only those APs that belong to the specified join profile.

```
Device# show ap profile profile-name hyperlocation detail
```

```
Profile Name: profile-name
Hyperlocation operational status: Up
Reason: N/A
Hyperlocation NTP server: 209.165.200.224
Hyperlocation admin status: Enabled
Hyperlocation detection threshold (dBm): -90
Hyperlocation trigger threshold: 8
Hyperlocation reset threshold: 7
```

AP Name	Radio MAC	Method	CMX IP
APf07f.0635.2d40	f07f.0635.2d40	WSM2+Ant	198.51.100.2
APf07f.0635.2d41	f07f.0635.2d41	Local	198.51.100.3
APf07f.0635.2d42	f07f.0635.2d42	WSM	198.51.100.4

To display configuration values for an AP profile, use the following command:

```
Device# show ap profile profile-name detailed
```

```
Hyperlocation :
Admin State      : ENABLED
PAK RSSI Threshold Detection: -100
PAK RSSI Threshold Trigger : 10
PAK RSSI Threshold Reset   : 8
.
.
.
```

To display the Cisco CMXs that are correctly joined and used by hyperlocation, use the following command:

```
Device# show ap hyperlocation cmx summary
```

```
Hyperlocation-enabled CMXs
```

IP	Port	Dest MAC	Egress src MAC	Egress VLAN	Ingress src MAC	Join time
198.51.100.4	2003	aaaa.bbbb.cccc	aabb.ccdd.eeff	2	0000.0001.0001	12/14/18 09:27:14

To display the hyperlocation client statistics, use the following command:

```
Device# show platform hardware chassis active qfp
feature wireless wlclient cpp-client summary
```

```
Client Type Abbreviations:
RG - REGULAR BL - BLE
HL - HALO LI - LWFL INT
Auth State Abbreviations:
```

```

UK - UNKNOWN IP - LEARN IP IV - INVALID
L3 - L3 AUTH RN - RUN
Mobility State Abbreviations:
UK - UNKNOWN IN - INIT
LC - LOCAL AN - ANCHOR
FR - FOREIGN MT - MTE
IV - INVALID
EoGRE Abbreviations:
N - NON EOGRE Y - EOGRE
CPP IF_H      DPIDX      MAC Address      VLAN  CT  MCVL  AS  MS  E  WLAN POA
-----
0X32         0XF0000001  0000.0001.0001  9    HL  0     RN  LC  N   NULL

```

To display the interface handle value statistics, use the following command:

```

Device# show platform hardware chassis active
qfp feature wireless wlclient datapath cpp-if-handle 0x32 statistics start

```

To display the recorded flow, use the following command:

```

Device# show platform hardware chassis active
qfp feature wireless wlclient datapath cpp-if-handle 0X32 statistics

Rx                Pkts                Bytes
26                3628

```

To stop statistics capture, use the following command:

```

Device# show platform hardware chassis active
qfp feature wireless wlclient datapath cpp-if-handle 0x32 statistics stop

```

To view the APs requested by Cisco CMX with AP groups' support, use the following commands:

```

Device# show nmsp subscription group summary

CMX IP address: 198.51.100.4
Groups subscribed by this CMX server:
Group name: CMX_1198.51.100.4

Device# show nmsp subscription group detail ap-list CMX_198.51.100.1 198.51.100.1

CMX IP address: 198.51.100.1
CMX Group name: CMX_198.51.100.1
CMX Group AP MACs:
: aa:bb:cc:dd:ee:01 aa:bb:cc:dd:ee:02 aa:bb:cc:dd:ee:03 aa:bb:cc:dd:ee:03

```

