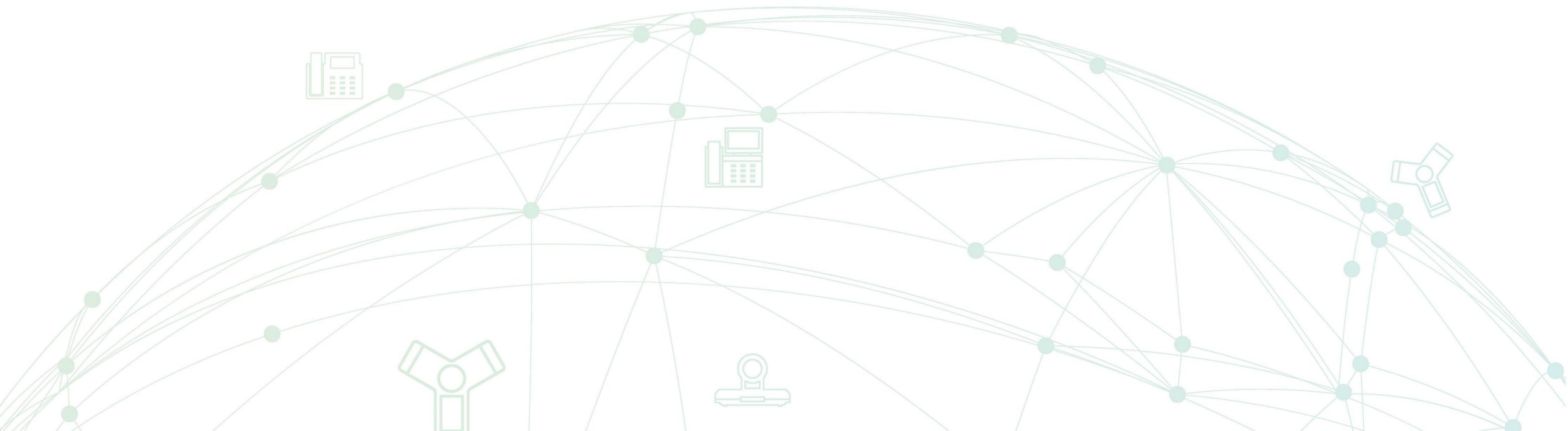


W90 LAN Sync Introduction



W90 LAN Sync Introduction

1. Why LAN Sync ?

2. LAN Sync Requirements

3. Deployment Recommendations

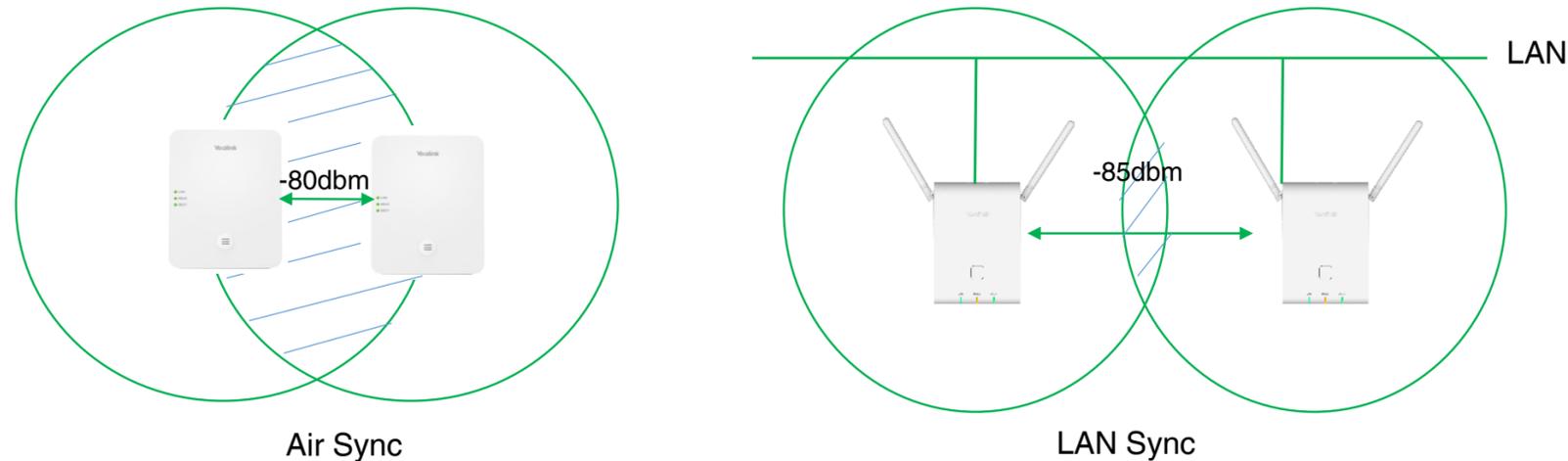
4. LAN Sync Method

5. Prepare to Use the LAN Sync

6. LAN Sync Configuration

Why LAN Sync ?

Different from DECT synchronization, which is synchronized “over the air”, LAN-based synchronization takes place via LAN.



About deployment:

Synchronization via LAN and air can be combined in the same multi-cell system.

For more information, refer to the administrator guide.

Disadvantages of DECT synchronization:

It is greatly influenced by the external environment, such as

1. In the warehouse, with the accumulation of goods, signal transmission is blocked and cannot be synchronized normally, affecting the overall signal transmission of the system.
2. In an environment with severe interference, it is difficult to guarantee the synchronization quality between bases.

Advantages of LAN synchronization compared with DECT synchronization:

1. Fewer base stations are required as the overlapping area of the base stations is smaller.
2. The system is more stable:
 - ① The system synchronization is not influenced by DECT signal or the environment changes, greatly improving the stability.
 - ② When a non-Master base fails, it has no impact on other base stations.
3. The configuration is much simpler because no synchronization levels need to be manually configured.

Disadvantages of LAN synchronization:

1. Need special network

LAN Sync Requirements

W90B configuration

Except for Precision Time Protocol Version 2 (PTPv2), LAN synchronization also requires a W90B device as the LAN master and the remaining devices as LAN slaves. The LAN master must be on DECT sync level 1. In this case, you do not need to configure the sync level for other W90B devices.

Network requirements

1. Base stations must be in the same network segment.
2. Precision Time Protocol (PTPv2) with deviation less than 500ns (rms).
3. Switch requirements
 - ① PTP switch: Layer 2 (one step/two step); Layer 3 (one step/two step)
 - ② Common PoE switch (need to meet network requirements)

Note: To ensure reliable synchronization, we recommend that you use a Layer 3 switch that supports PTP.

DECT requirements

When using LAN synchronization, it does not mean that the DECT signal quality is not important anymore. You still need to do a DECT measurement.

Base stations that are synchronized via LAN must be able to see the neighbor base stations via a stable DECT signal.

For this you can use the DECT IP Multi-Cell Deployment ToolKit. The recommended RSSI value is between -27 dBm and -95 dBm.

About PTPv2:

Precision Time Protocol version 2 (PTPv2) is used to synchronize the DECT radios via the LAN. PTPv2 is defined in the standard IEEE 1588-2008 and a brief introduction can be found here:
http://en.wikipedia.org/wiki/Precision_Time_Protocol.

About measurement:

Refer to the deployment guide.

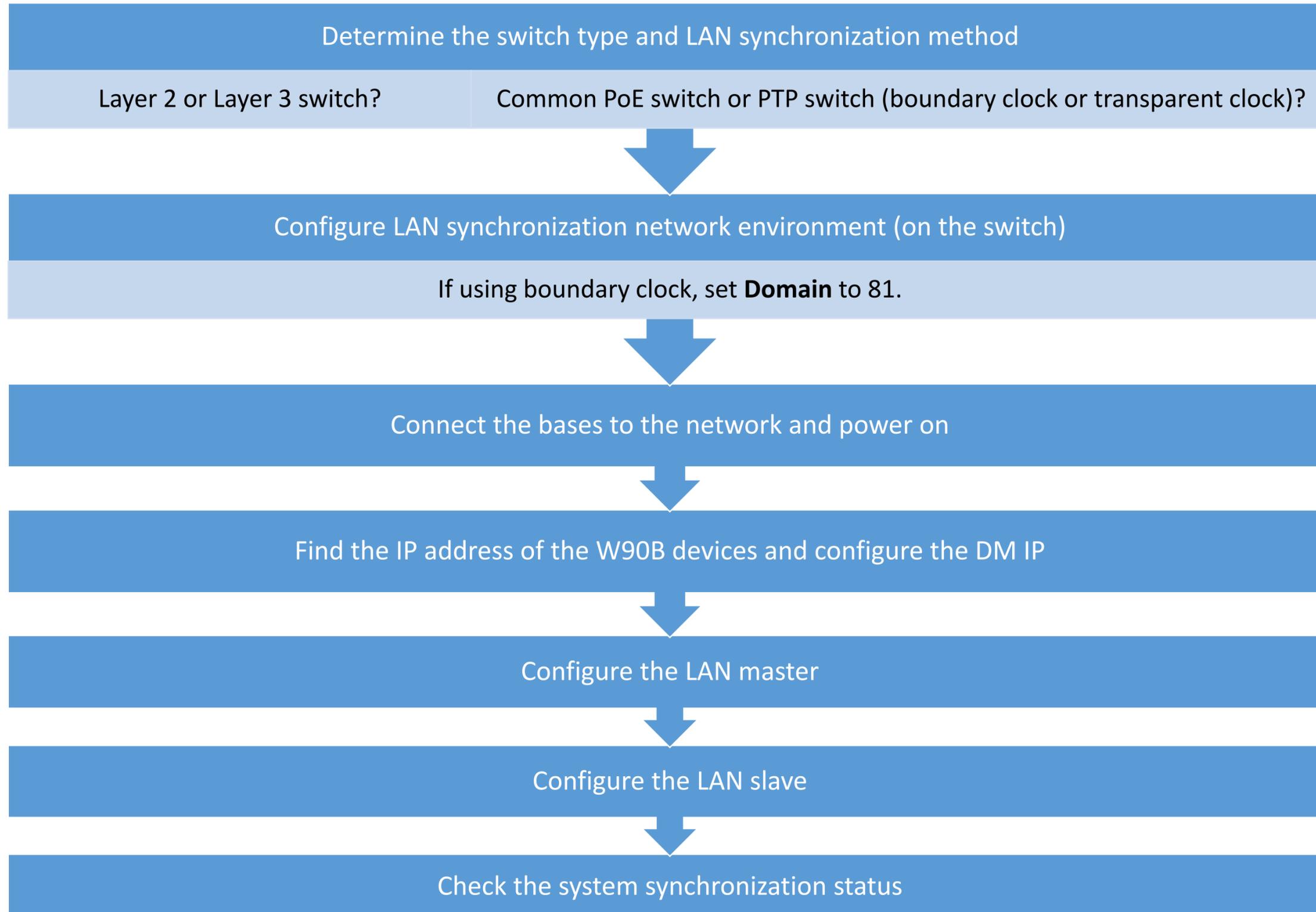
Deployment Recommendations

- ① Use a specific switch that supports PTP to guarantee the large amount of packet delay and jitter.
- ② The less switch hops, the lower the transmission delay and jitter are. We recommend that you deploy only one additional switch between the LAN master and LAN slave.
- ③ If you use a high-quality switch, you will get a lower packet delay as well as smaller jitter. Therefore, the synchronization becomes more stable.
- ④ Within the range of the maximum throughput capacity, the increase in traffic load on the switch impacts the packet delay and jitter negatively. Therefore, we recommend that you only connect W90B devices in the same switch.

LAN Sync Method

- ① **PTP transparent clock:** After you enable a transparent clock on the switch, connect the LAN master and LAN slaves to the same switch. The synchronization is stable.
- ② **PTP boundary clock:** After you enable a boundary clock and set Domain to 81 on the switch, connect the LAN master and LAN slaves to the same switch and make sure the Ext PTP Master is enabled on the LAN master.
The synchronization is stable.
- ③ **Common PoE switch:** A switch that does not enable the PTP protocol or does not support the PTP protocol. When the LAN master and LAN slaves are connected to the same switch, the synchronization is relatively stable due to the network flowdowns.

Prepare to Use the LAN Sync



Note:

We recommend that you use a Layer 3 switch that supports PTP.

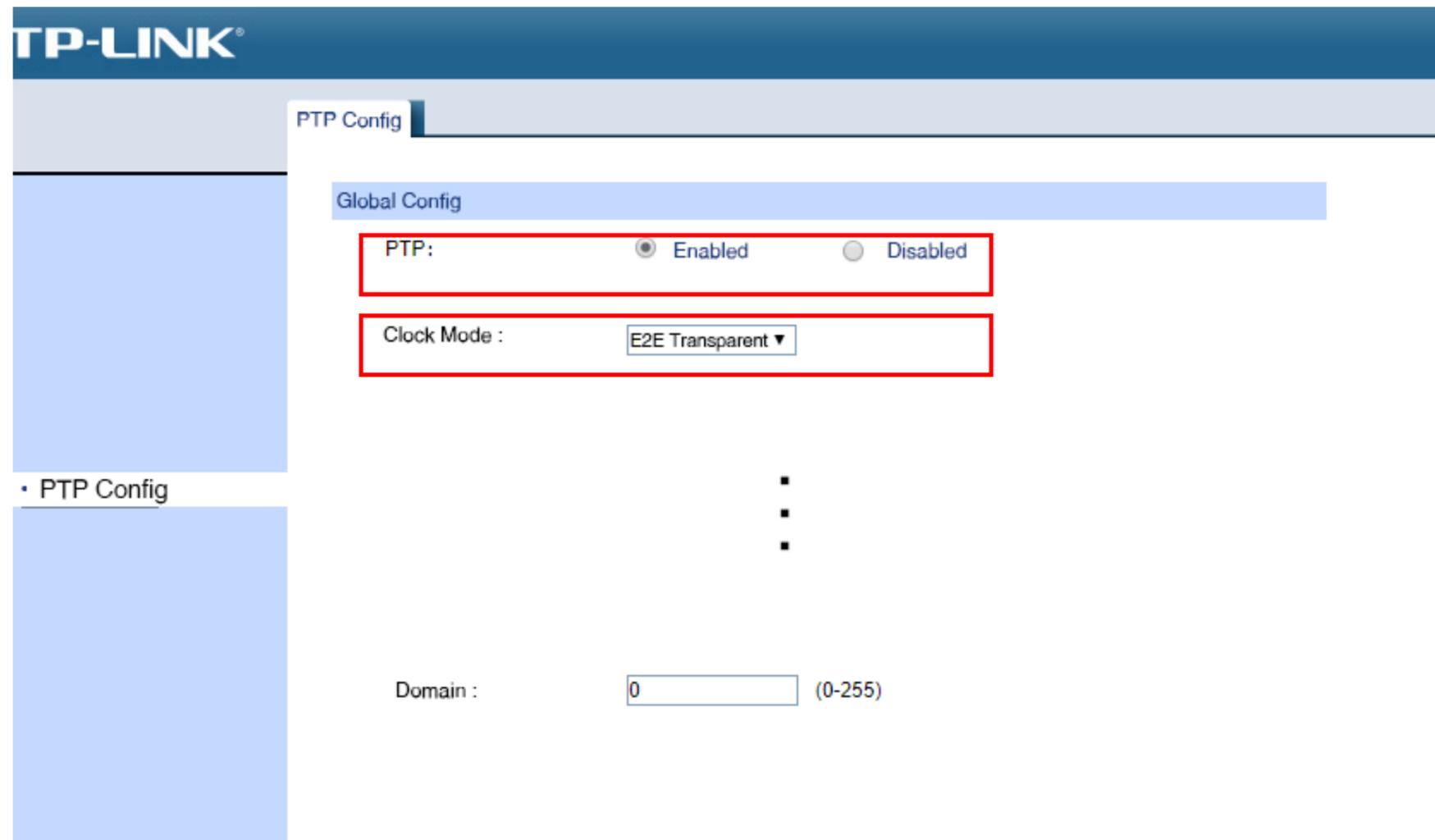
LAN Sync Configuration

Step 1: Configure LAN synchronization network environment (on the switch)

Sync method 1: Transparent Clock

Procedure

1. Enable **PTP** on the switch.
2. Select **E2E Transparent** from the **Clock Mode** drop-down menu.



Note:

As we are not the experts for the switches, the screenshots are for reference only, please refer to the switch guide for more information.

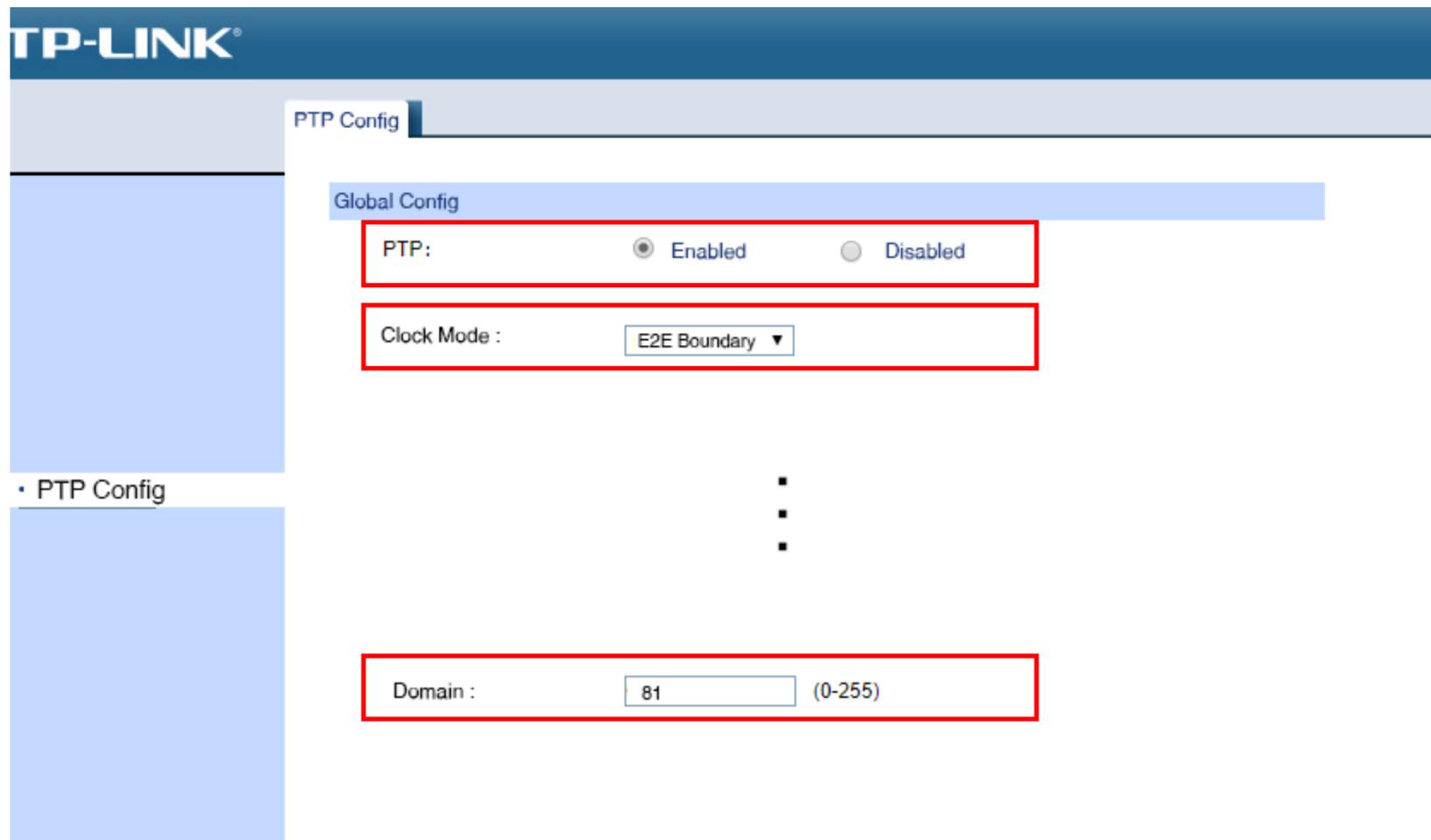
LAN Sync Configuration

Step 1: Configure LAN synchronization network environment (on the switch)

Sync method 2: Boundary Clock

Procedure

1. Enable **PTP** on the switch.
2. Select **E2E Boundary** from the **Clock Mode** drop-down menu.
3. Set the **Domain** to **81** on the switch.



Note:

As we are not the experts for the switches, the screenshots are for reference only, please refer to the switch guide for more information.

LAN Sync Configuration

Step 1: Configure LAN synchronization network environment (on the switch)

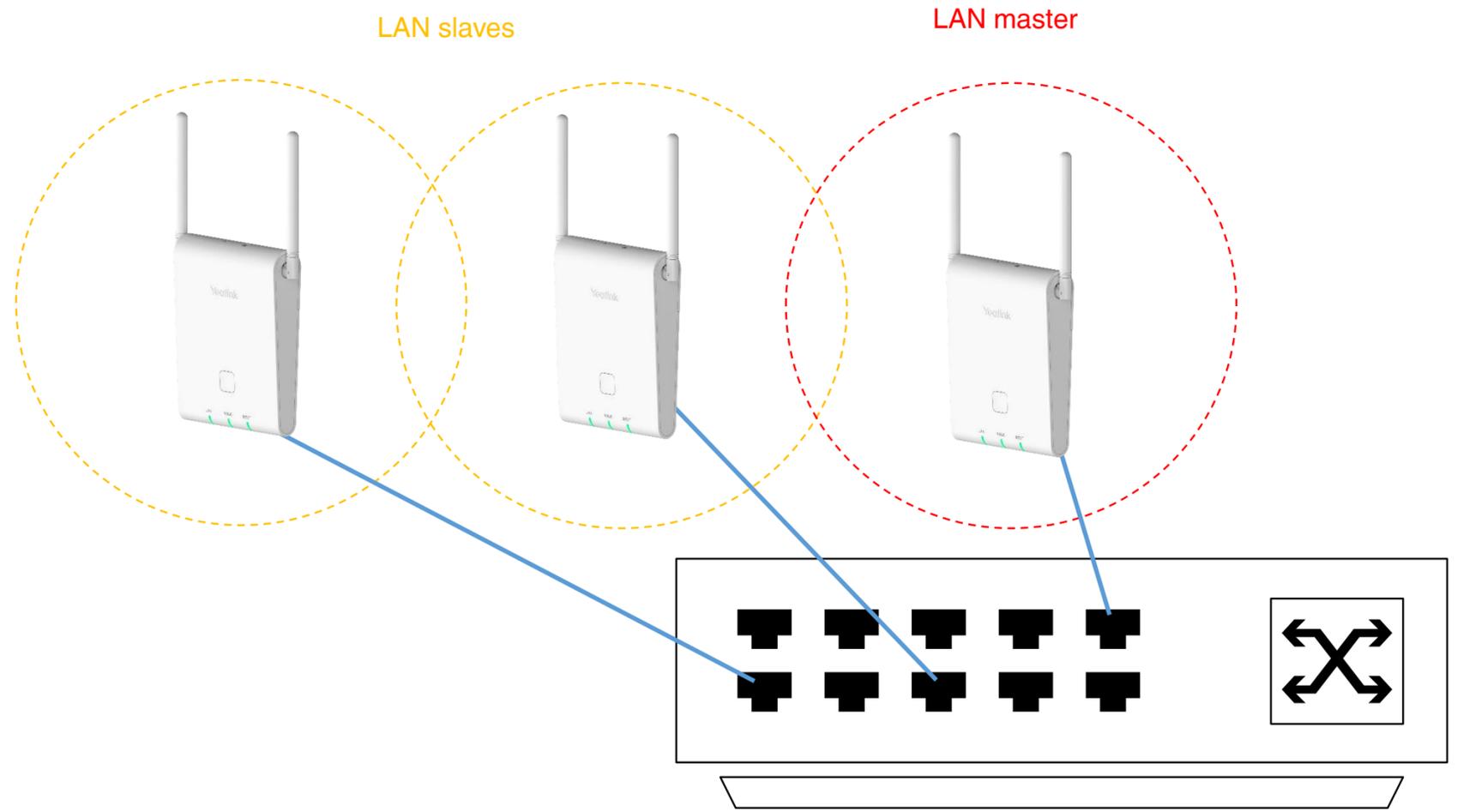
Sync method 3: Common PoE switch

No special settings are required on the switch.

LAN Sync Configuration

Step 2: Connect the bases to the same switch and power on

Example



Note:

We recommend that you deploy only one additional switch between the LAN master and LAN slave.

It doesn't matter where DM locates. But make sure the LAN master and LAN slaves are on the same network segment.

One W90DM supports up to 60 bases on the same network segment

LAN Sync Configuration

Step 3: Find the IP addresses of the DM and bases, and then configure them

Yealink Discovery Tool (V1.0.0.0)

10.81.1-200.1-200

Stop IP rule: 192.168.1,3,7,5-10.2-10,15-200

IP	Product Name	Version	MAC
10.81.45.111	W90B	130.85.0.10	80:5E:C0:D8:32:F7
10.81.35.16	W90B	130.83.249.136	00:00:00:00:00:4D
10.81.33.27	W90B	130.83.249.215	80:5E:C0:D8:32:F2
10.81.45.98	W90B	130.83.249.216	80:5E:C0:D9:C5:E8
10.81.56.119	W80B	103.83.250.240	None
10.81.6.2	W80DM	1649.83.27.1	80:5E:C0:3E:72:88
10.81.35.3	W80DM	1649.83.249.1	80:5E:C0:DC:7B:88
10.81.12.149	W90B	130.85.0.10	80:5E:C0:D8:33:16
10.81.36.8	W80DM	103.83.252.66	00:15:65:FE:FE:3C
10.81.33.29	W90DM	130.83.249.216	80:5E:C0:D8:33:09
10.81.6.24	W90DM	130.85.0.15	80:5E:C0:D8:33:04
10.81.24.5	W90B	130.85.0.10	80:5E:C0:D8:33:0E
10.81.4.105	W80DM	103.83.0.92	80:5E:C0:70:FC:F3
10.81.9.26	W90B	130.85.0.10	80:5E:C0:D8:33:18
10.81.43.22	W90B	130.85.0.10	00:90:00:00:00:17
10.81.56.70	W80B	103.83.0.80	80:5E:C0:A5:AA:99
10.81.12.77	W90DM	130.83.0.10	00:90:00:00:00:35
10.81.56.12	W90DM	130.83.254.40	80:5E:C0:DB:A7:1F

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Yealink Discovery Tool (V1.0.0.0)

10.81.1-200.1-200

Scan IP rule: 192.168.1,3,7,5-10.2-10,15-200

IP	Product Name	Version	MAC
10.81.56.86	W80DM	103.83.0.87	80:5E:C0:D2:B4:D9
10.81.49.32	W90B	130.85.0.10	80:5E:C0:D8:32:E4
10.81.6.104	W90B	130.85.0.10	80:5E:C0:D8:32:E5
10.81.41.16	W90B	130.85.0.10	80:5E:C0:D8:32:E8
10.81.37.35	W90B	130.85.0.10	80:5E:C0:D8:32:E9
10.81.19.14	W90B	130.85.0.10	80:5E:C0:D8:32:EA
10.81.38.17	W90B	130.85.0.10	80:5E:C0:D8:32:EB
10.81.12.77	W90DM	130.83.0.10	00:90:00:00:00:35
10.81.56.12	W90DM	130.83.254.40	80:5E:C0:DB:A7:1F
10.81.12.26	W90B	130.85.0.10	00:90:00:00:00:2D
10.81.38.17	W90B	130.85.0.10	80:5E:C0:D8:32:EB
10.81.12.78	W90B	130.85.0.15	00:90:00:00:00:29
10.81.2.16	W90B	130.85.193.1	80:5E:C0:D8:33:0D
10.81.33.45	W90B	130.83.249.216	80:5E:C0:D8:33:03
10.81.6.43	W90B	130.85.0.10	80:5E:C0:D9:C4:3C
10.81.56.80	W90B	130.85.0.10	80:5E:C0:D8:32:EC
10.81.56.86	W80DM	103.83.0.87	80:5E:C0:D2:B4:D9
10.81.18.14	W90B	130.85.0.10	80:5E:C0:DB:A7:1A

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10.81.45.69	W90B	130.83.254.34	00:00:00:00:00:3C
10.81.33.46	W90DM	130.83.249.216	00:00:00:00:00:46
10.81.12.136	W90B	130.85.0.10	00:00:00:00:00:47
10.81.12.124	W90DM	130.85.0.10	00:00:00:00:00:48
10.81.4.15	W90B	130.85.0.15	00:00:00:00:00:49
10.81.6.120	W90B	130.85.0.15	00:00:00:00:00:4C
10.81.35.16	W90B	130.83.249.136	00:00:00:00:00:4D
10.81.45.7	W80DM	103.83.251.159	00:15:65:FE:FE:30
10.81.36.8	W80DM	103.83.252.66	00:15:65:FE:FE:3C
10.81.6.16	W90B	130.85.0.15	00:90:00:00:00:06
10.81.14.73	W90B	130.85.0.10	00:90:00:00:00:10
10.81.8.57	W90B	130.85.0.15	00:90:00:00:00:11
10.81.9.29	W90B	130.85.0.10	00:90:00:00:00:15
10.81.43.22	W90B	130.85.0.10	00:90:00:00:00:17
10.81.33.22	W90DM	130.83.249.215	00:90:00:00:00:18
10.81.12.58	W90DM	130.85.0.15	00:90:00:00:00:1E

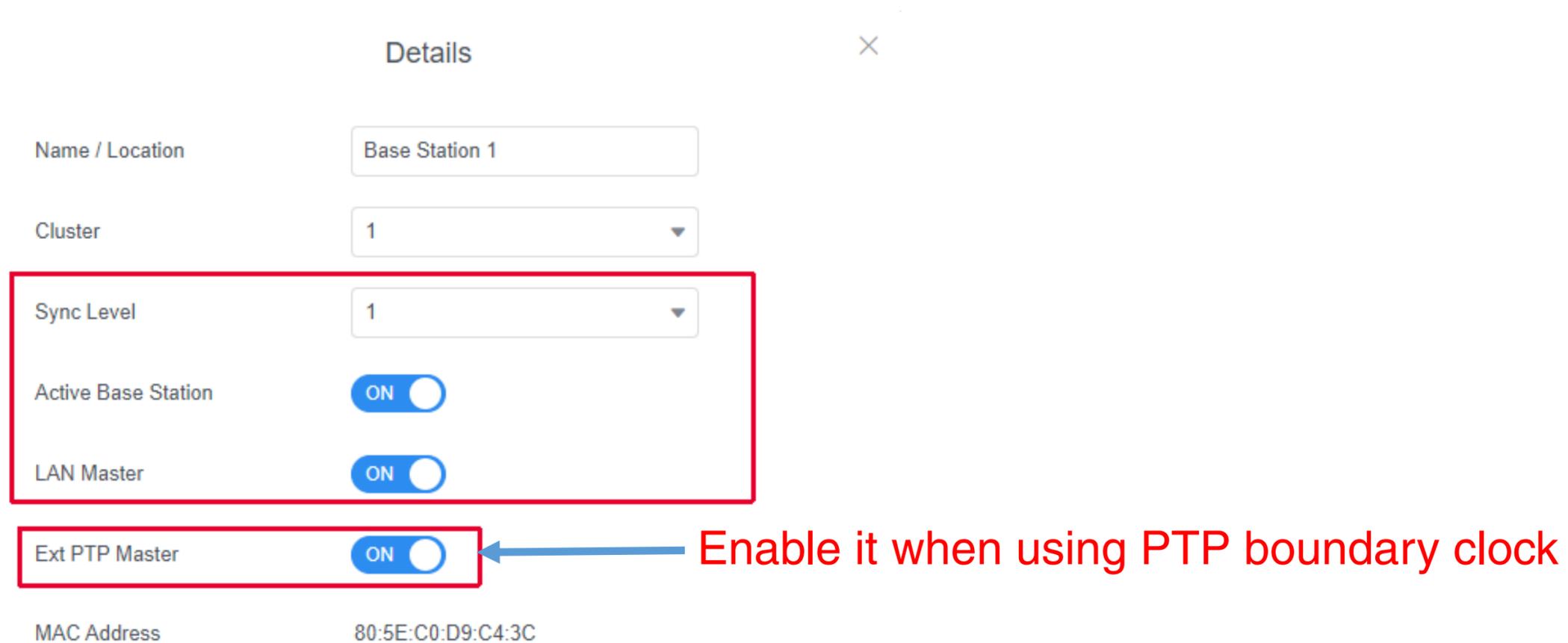
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LAN Sync Configuration

Step 4: Configure the LAN master

Procedure

1. Access the web user interface of the DM.
2. Go to **Base Station > Base Station Registration**.
3. Click  next to the base you want to set as LAN master.
4. Complete the configuration as below.



Details

Name / Location: Base Station 1

Cluster: 1

Sync Level: 1

Active Base Station: ON

LAN Master: ON

Ext PTP Master: ON

MAC Address: 80:5E:C0:D9:C4:3C

Enable it when using PTP boundary clock

5. Confirm the action.

Note:

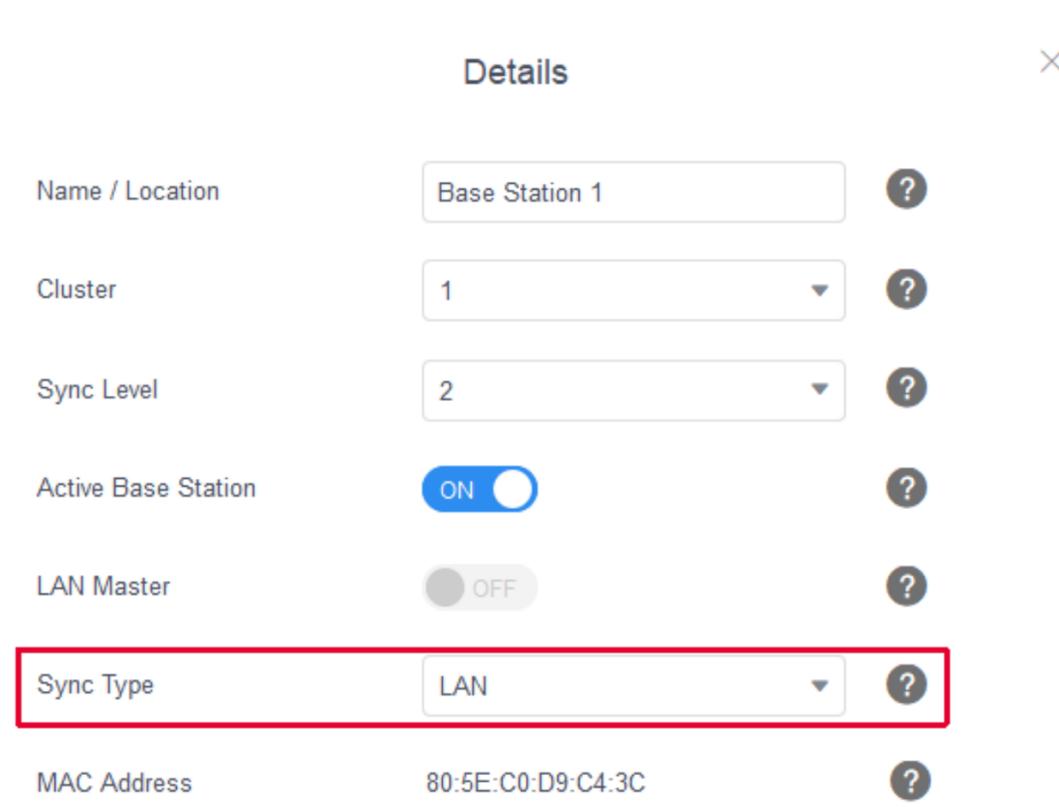
Make sure there are no bases with sync level 1 registered on the current system.

LAN Sync Configuration

Step 5: Configure the LAN slave

Procedure

1. Access the web user interface of the DM.
2. Go to **Base Station > Base Station Registration**.
3. Click  next to the base you want to set as LAN slave.
4. Select **LAN** from the **Sync Type** drop-down menu.



The screenshot shows a 'Details' configuration window for a base station. The fields are as follows:

Field	Value	Help Icon
Name / Location	Base Station 1	?
Cluster	1	?
Sync Level	2	?
Active Base Station	ON	?
LAN Master	OFF	?
Sync Type	LAN	?
MAC Address	80:5E:C0:D9:C4:3C	?

5. Confirm the action.

Note:

If you are using Layer 2 switch, you need to configure "station.X.lan_transport" to 3 after registration.

For more information on the parameter, refer to the administrator guide.

LAN Sync Configuration

Step 6: Check the system sync status

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Default password is in use. Please change!

Connected Base Stations

Base Station

Registered Base Stations: 3 | 60 Abnormal Base Stations: 0 System Sync: LAN

#	Base Station	IP	MAC	Cluster	Sync Level	LAN Master	Sync Type	Status	Operation
1	LAN Master	10.82.24.39	00:00:00:00:00:4C	1	1	ON	-	Active and synced	
2	Base Station 2	10.82.24.44	80:5E:C0:D9:C4:3C	1	2	OFF	LAN	Active and synced	
3	Base Station 4	10.82.24.45	80:5E:C0:D8:32:E5	1	2	OFF	LAN	Active and synced	

Total: 3 1 / Page 10 / Page Goto 1 Page

[Configure DM IP for Bases](#) [Reboot All](#) [Refresh](#)

About sync status:

- **Offline:** not available.
- **Deactive:** available but not activated.
- **Active:** activated but not synchronized.
- **Active and synced:** activated and synchronized.

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