

DCN



DCN WLAN Training – DCSE service

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01 Basic operation of WLAN product

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01

Basic operation of WLAN product

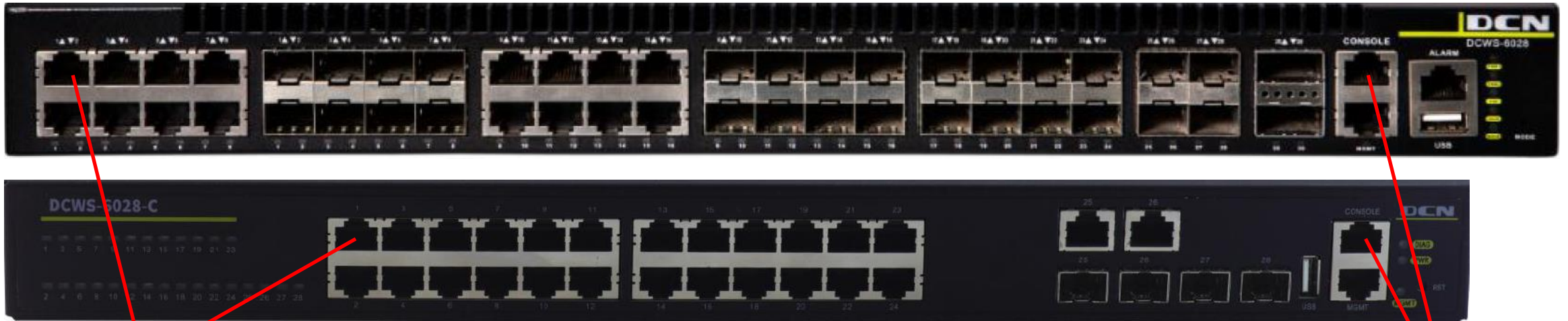
- Basic management of AC & AP
- Upgrade AC & AP firmware
- Prepare & Install license on AC

01

Basic operation of WLAN product

- **Basic management of AC & AP**
- **Upgrade AC & AP firmware**
- **Prepare & Install license on AC**

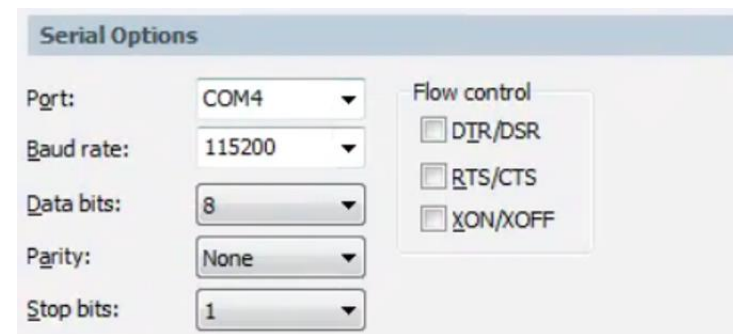
Basic management of AC - How to login AC CLI



Connect PC' s RJ-45 network interface to AC' s business port or MGMT port, to log in to the AC via **Telnet**.

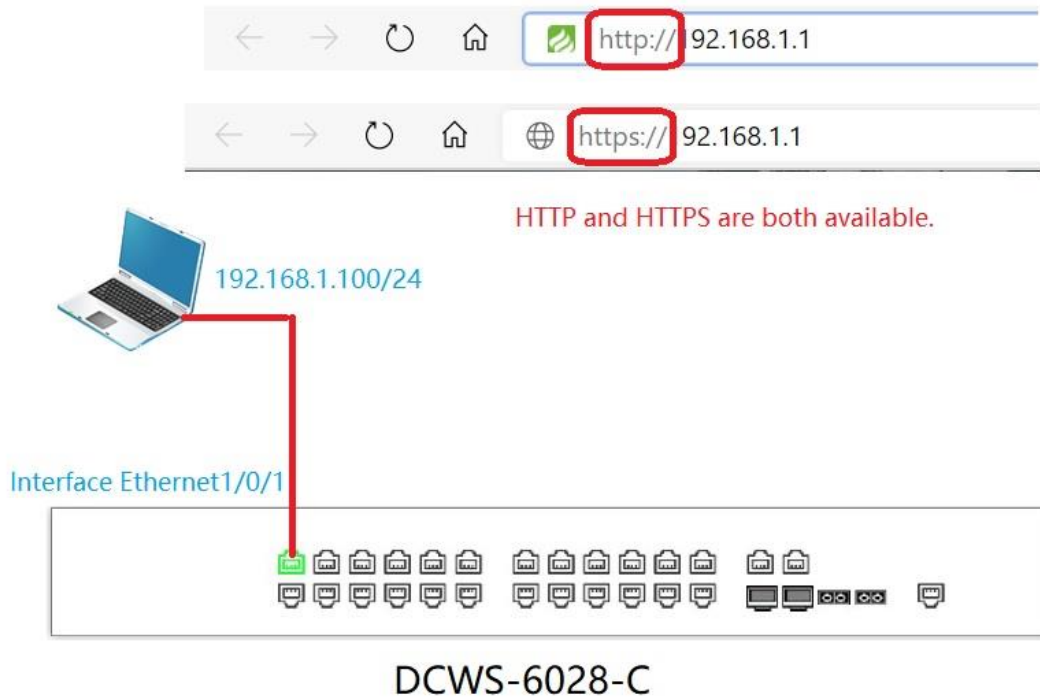
Note:

1. Both methods require username and password verification.
2. The default IP address of AC is 192.168.1.1/24 on interface vlan 1
3. The default username and password both are "admin"
4. The TELNET service of AC is turned on by default, and the SSH service is turned off by default.



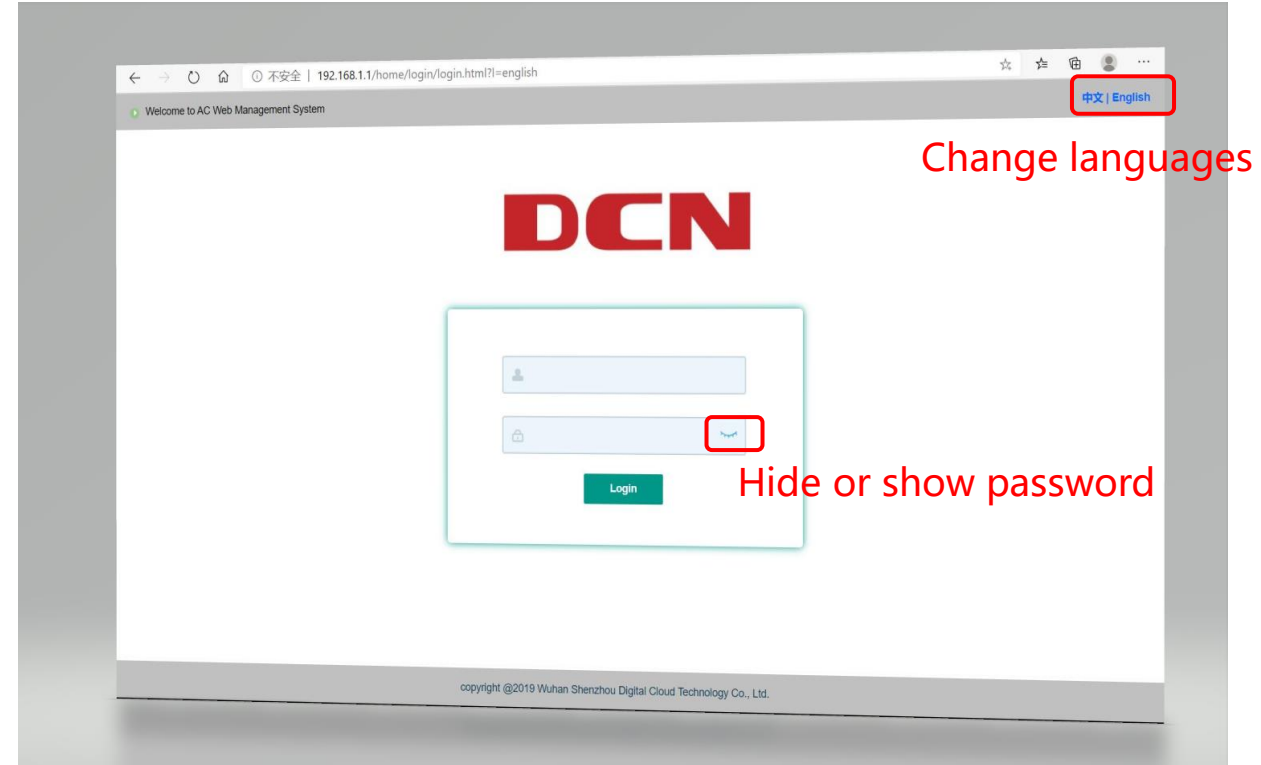
connect PC' s serial port to RJ-45 **console port** on AC.

Basic management of AC - How to login AC Web

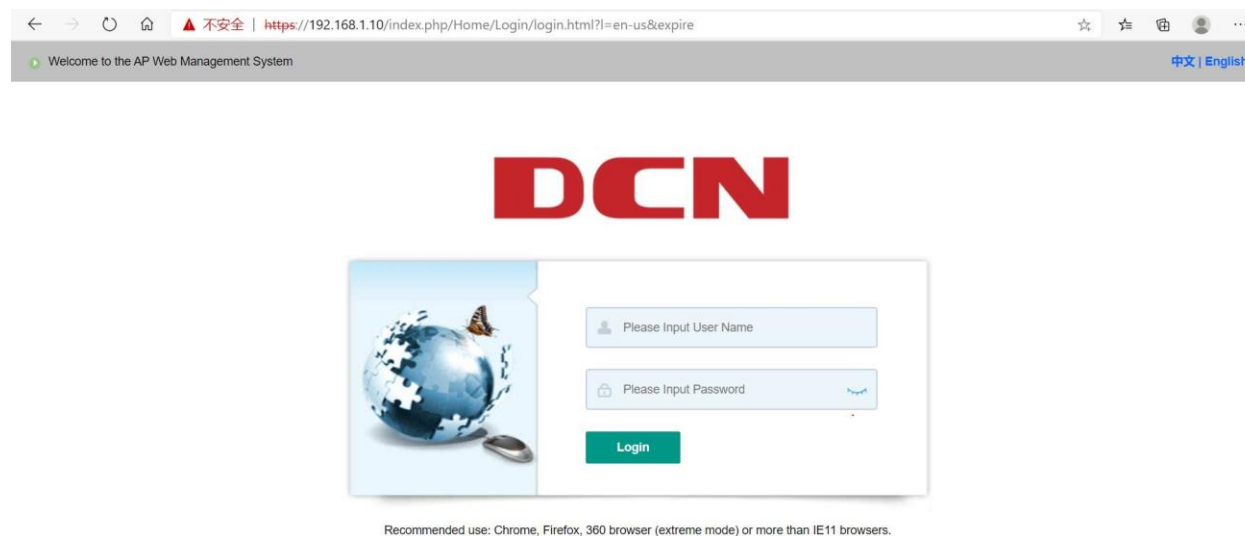
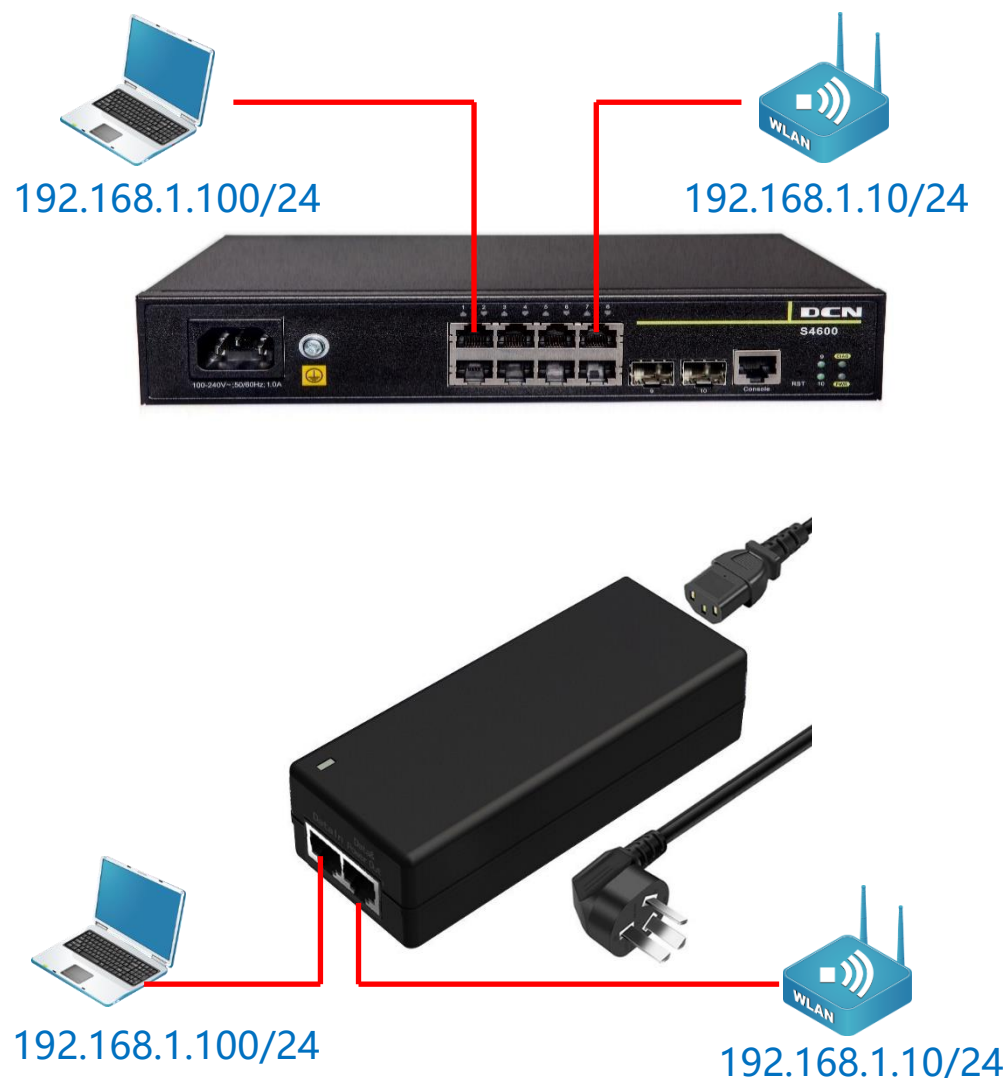


Note:

1. The default IP address of AC is 192.168.1.1/24 on interface vlan 1.
2. The default username and password both are 'admin'.



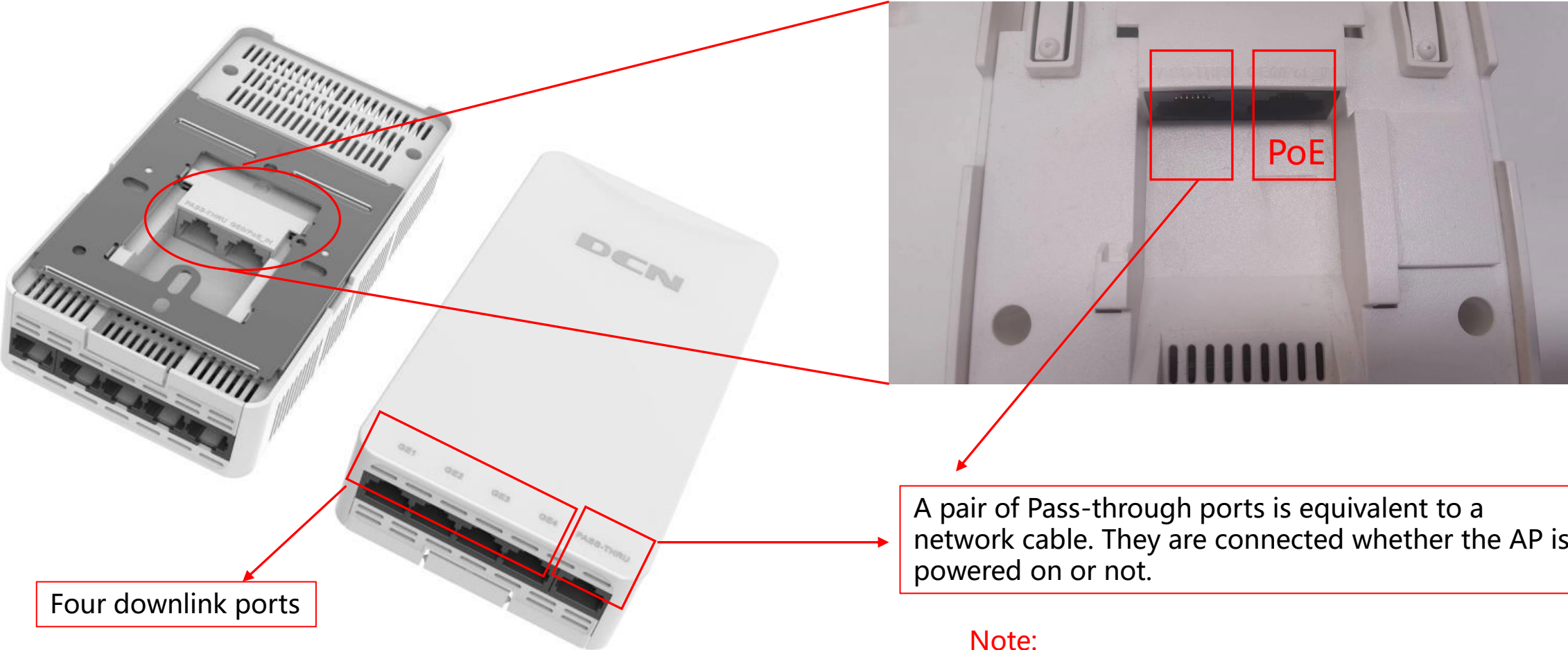
Basic management of AP - How to login AP Web



Note:

1. The default IP address of AP is 192.168.1.10/24.
2. The default username and password for logging in to the Web management page both are 'admin'.
3. The TELNET service of AP is turned on by default. If the FIT AP is unmanaged, the login username and password are 'admin' and 'dcn_debug'. If the AP is already managed, the login username and password are 'admin'.

Basic management of AP – In-wall AP uplink and downlink ports



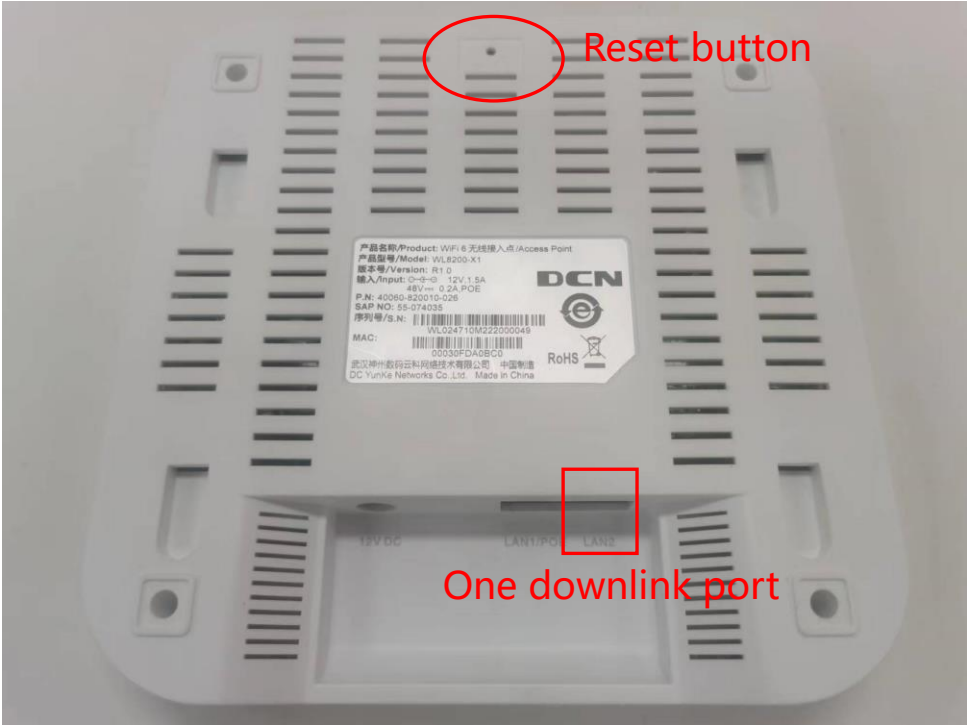
Four downlink ports

A pair of Pass-through ports is equivalent to a network cable. They are connected whether the AP is powered on or not.

Note:
It is recommended that the debugging computer be connected to the downlink port or the default SSID 'DCN_WLAN' of AP for configuration.

Model	LAN port	Console port	Pass-through port	Reset button
WL8200-XW2	Yes	No	Yes	Yes

Basic management of AP - Indoor AP uplink and downlink port



Model	LAN port	Console port	Pass-through port	Reset button
WL8200-X1	Yes	No	No	Yes

Note:

- Each model of AP has a hardware reset button to reset the software settings of the AP.
- All APs of WIFI6 series have at least one downlink port.

Basic management of AP - Indoor AP uplink and downlink ports



Model	LAN port	Console port	Pass-through port	Reset button
WL8200-X10	Yes	Yes	No	Yes

- Note:
- PoE power supply to the AP must be connected to the uplink port.
 - Some APs have console port. In some cases, you can connect debugging computer to the console port of AP to repair the firmware or troubleshoot. The baud rate of the console port of the AP is 115200.

Basic management of AP - Outdoor AP uplink and downlink ports



- Note:
- PoE power supply to the AP must be connected to the copper uplink port. Even if only SFP is used for uplink.
 - The reset key is inside the AP. If you need to use it, unscrew the waterproof screw first.

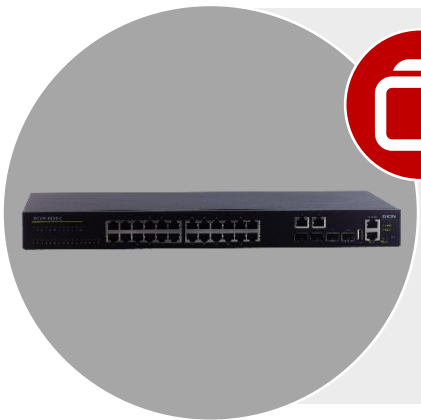
Model	LAN port	Console port	Pass-through port	Reset button
WL8200-XIT2	Yes	Yes	No	Yes

01

Basic operation of WLAN product

- **Basic management of AC & AP**
- **Upgrade AC & AP firmware**
- **Prepare & Install license on AC**

Upgrade AC & AP firmware - Available AC and AP versions



7.5.4.3
(R0002.0036)

The CLI can be
accessed through
the MGMT port

7.5.4.3
(R0002.0047)

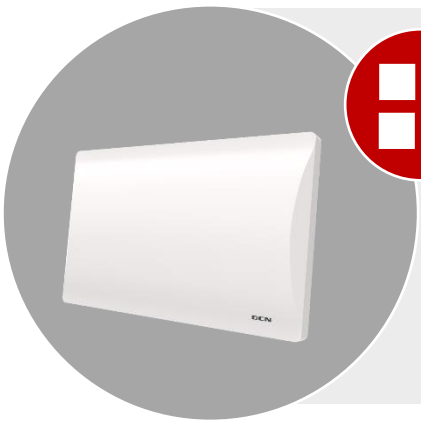
Support NAT
traversal scenario

7.5.4.3
(R0002.0054)

Restrict the use
of config mode
in CLI

7.5.4.3
(R0002.0057)

Improve
online
upgrading



3.9.3.1

Support
dcnimcloud

3.9.4.4

Support
dcnimcloud

4.1.1.8

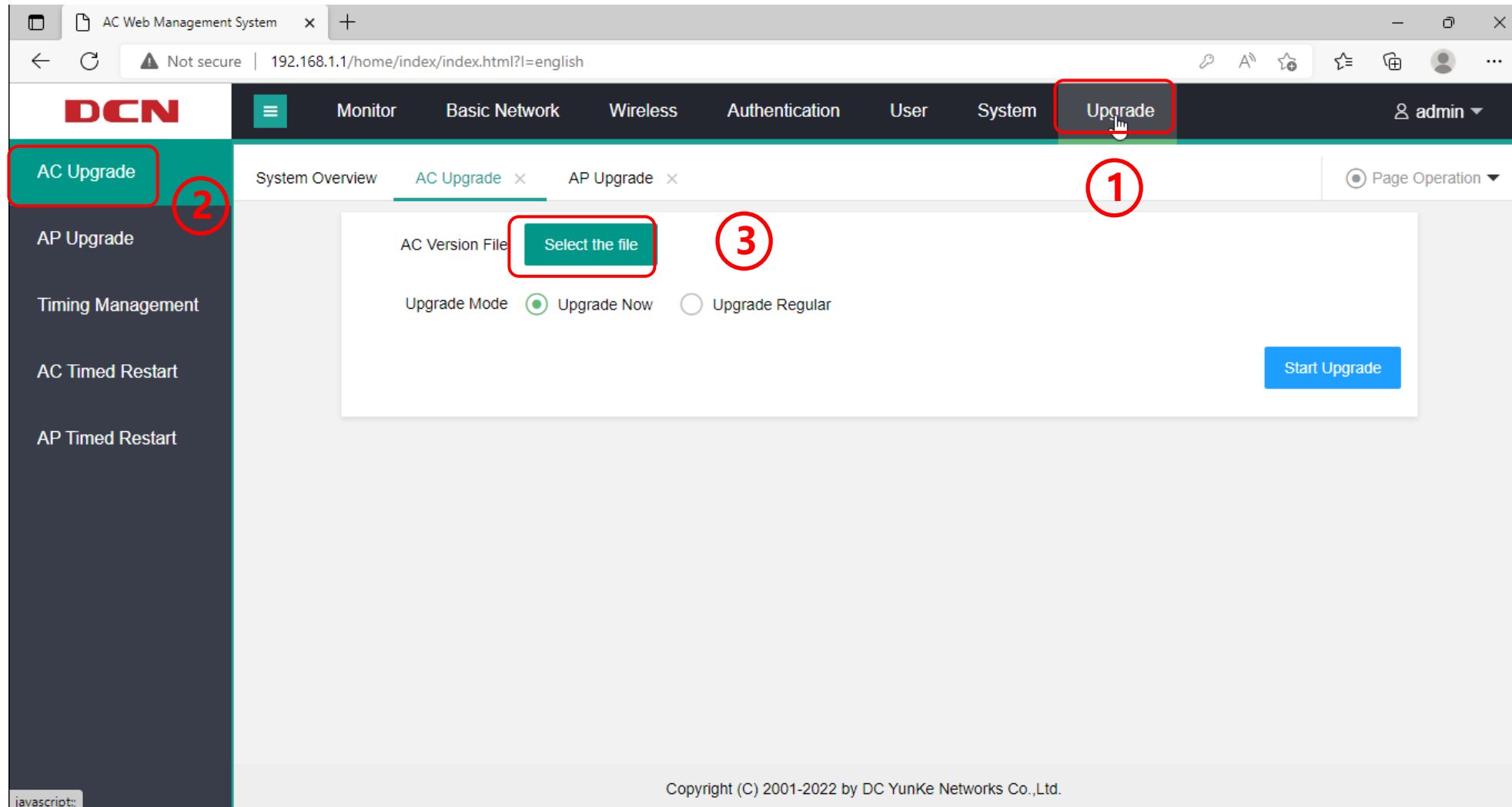
Support
dcnimcloud

5.1.1.23

Support
dcnimcloud

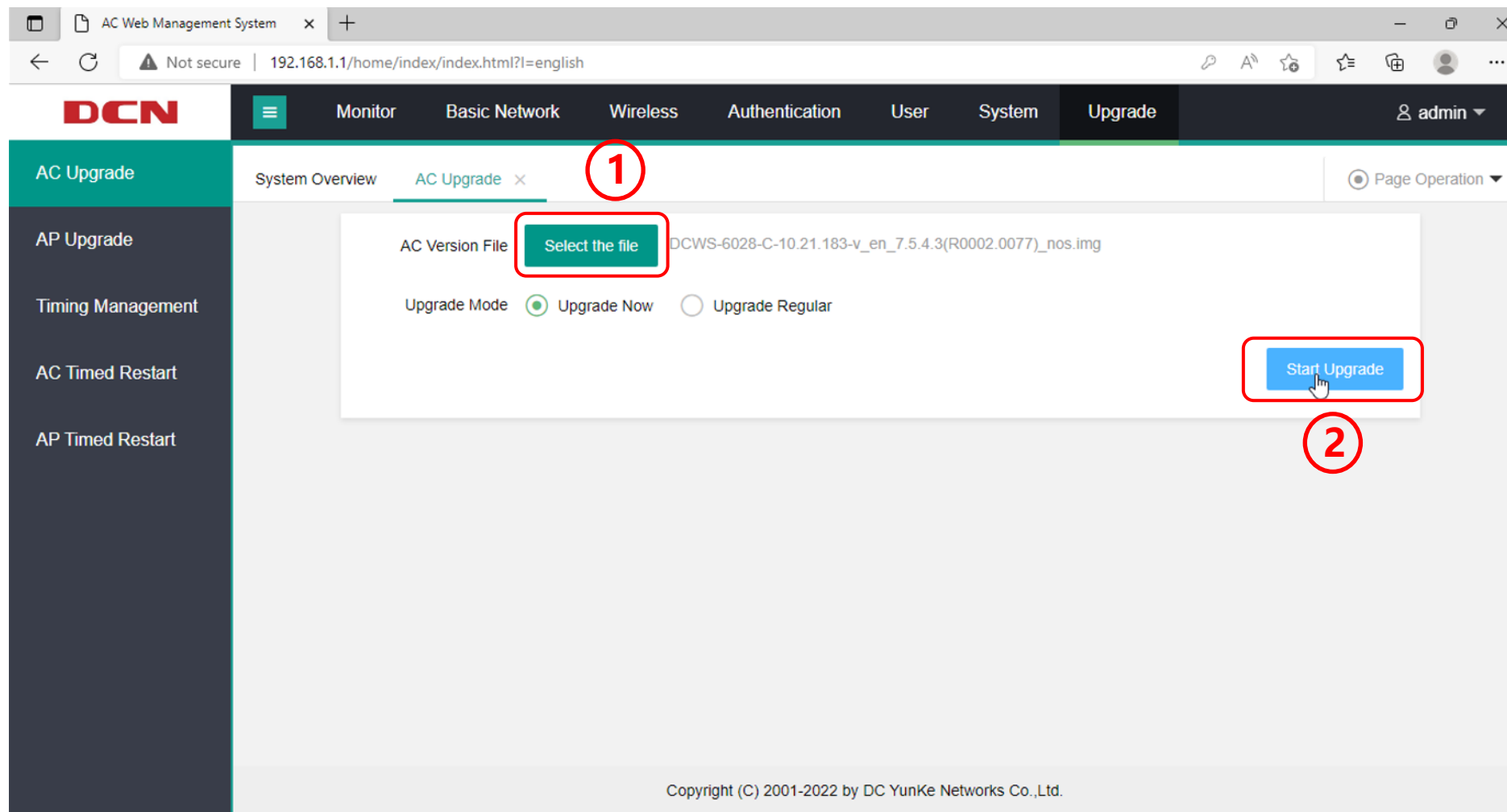
Upgrade AC firmware on AC Web

Select target AC firmware on AC web



Upgrade AC firmware on AC Web

Upload target AC firmware to AC web



Upgrade AC firmware on AC Web

Upload target AC firmware to AC web

The screenshot displays the DCN AC Web Management System interface. The top navigation bar includes the DCN logo and tabs for Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The Upgrade tab is active, and the left sidebar shows the AC Upgrade section. The main content area shows the AC Upgrade process with the following details:

- AC Version File: **Select the file** DCWS-6028-C-10.21.183-v_en_7.5.4.3(R0002.0077)_nos.img
- Upgrade Mode: ☒ Upgrade Now ☐ Upgrade Regular
- Start Upgrade** button

A red-bordered box highlights a message: "The file is being uploaded, please do not refresh or close the page, This process takes about 3 - 5 minutes. Please wait a moment."

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Upgrade AC firmware on AC Web

The screenshot shows a web browser window with the title "AC Web Management System". The address bar shows the URL "192.168.1.1/home/index/index.html?l=english". The browser's security status is "Not secure". The DCN logo is in the top left corner. The top navigation bar includes "Monitor", "Basic Network", "Wireless", "Authentication", "User", "System", and "Upgrade". The "Upgrade" tab is selected. On the left sidebar, "AC Upgrade" is selected, showing a list of options: "AP Upgrade", "Timing Management", "AC Timed Restart", and "AP Timed Restart". The main content area shows a success message: "The file is uploaded successfully and the device is reboot. This process may take a few minutes. Please wait a moment....". Below the message, it states: "The device will not be accessible during the reboot. Please do not turn off the power. After the reboot is completed, it will skip to the login page automatically. If the address of device changes, you need to visit the new IP address manually." A progress bar is shown at the bottom of the message box. The footer contains the copyright notice: "Copyright (C) 2001-2022 by DC YunKe Networks Co.,Ltd."

AC Web Management System

Not secure | 192.168.1.1/home/index/index.html?l=english

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

AC Upgrade

System Overview AC Upgrade

Page Operation

The file is uploaded successfully and the device is reboot. This process may take a few minutes. Please wait a moment....

The device will not be accessible during the reboot. Please do not turn off the power.

After the reboot is completed, it will skip to the login page automatically.

If the address of device changes, you need to visit the new IP address manually.

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Upgrade AP firmware on AC Web

Select target AP firmware on AC web

←↻⚠ Not secure | 192.168.1.1/home/index/index.html?l=english

DCN

☰

Monitor

Basic Network

Wireless

Authentication

User

System

Upgrade

admin ▾

AC Upgrade

AP Upgrade

Timing Management

AC Timed Restart

AP Timed Restart

System Overview

AC Upgrade ×

AP Upgrade ×

Page Operation ▾

Version File Management

AP Upgrade

AP Version File

Select the file

Start Upload

↻

File Name

Software Version

Operation

null

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Upgrade AC & AP firmware - Upgrade AP firmware via AC Web

Upload target AP firmware to AC web

The screenshot shows the DCN AC Web Management System interface. The browser address bar displays "192.168.1.1/home/index/index.html?l=english". The navigation menu includes "Monitor", "Basic Network", "Wireless", "Authentication", "User", "System", and "Upgrade". The "Upgrade" menu is selected, and the "AP Upgrade" sub-menu is active. The "AP Upgrade" section shows a "Version File Management" table with a "File Name" column. The "File Name" column contains the text "WL-8200-X4_4.1.1.47.tar". The "Software Version" column contains the text "null". The "Operation" column contains a "Start Upload" button. The "Select the file" button is circled in red with a "1" and the "Start Upload" button is circled in red with a "2".

File Name	Software Version	Operation
WL-8200-X4_4.1.1.47.tar	null	Start Upload

Upgrade AP firmware on AC Web

Check AP firmware already uploaded on AC web

AC Web Management

192.168.1.1/home/index/index.html?l=english

DCN

Monitor Basic Network Wireless Authentication User System Upgrade admin

AC Upgrade

AP Upgrade

Timing Management

AC Timed Restart

AP Timed Restart

System Overview AC Upgrade x AP Upgrade x

Page Operation

Version File Management AP Upgrade

AP Version File Select the file Start Upload

File Name	Software Version	Operation
WL-8200-X4_4.1.1.47.tar	4.1.1.47	

< 1 > go to 1 page confirm Totle 1 Items 10 Items/Page

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Upgrade AP firmware on AC Web

Select target APs to be upgraded on AC web

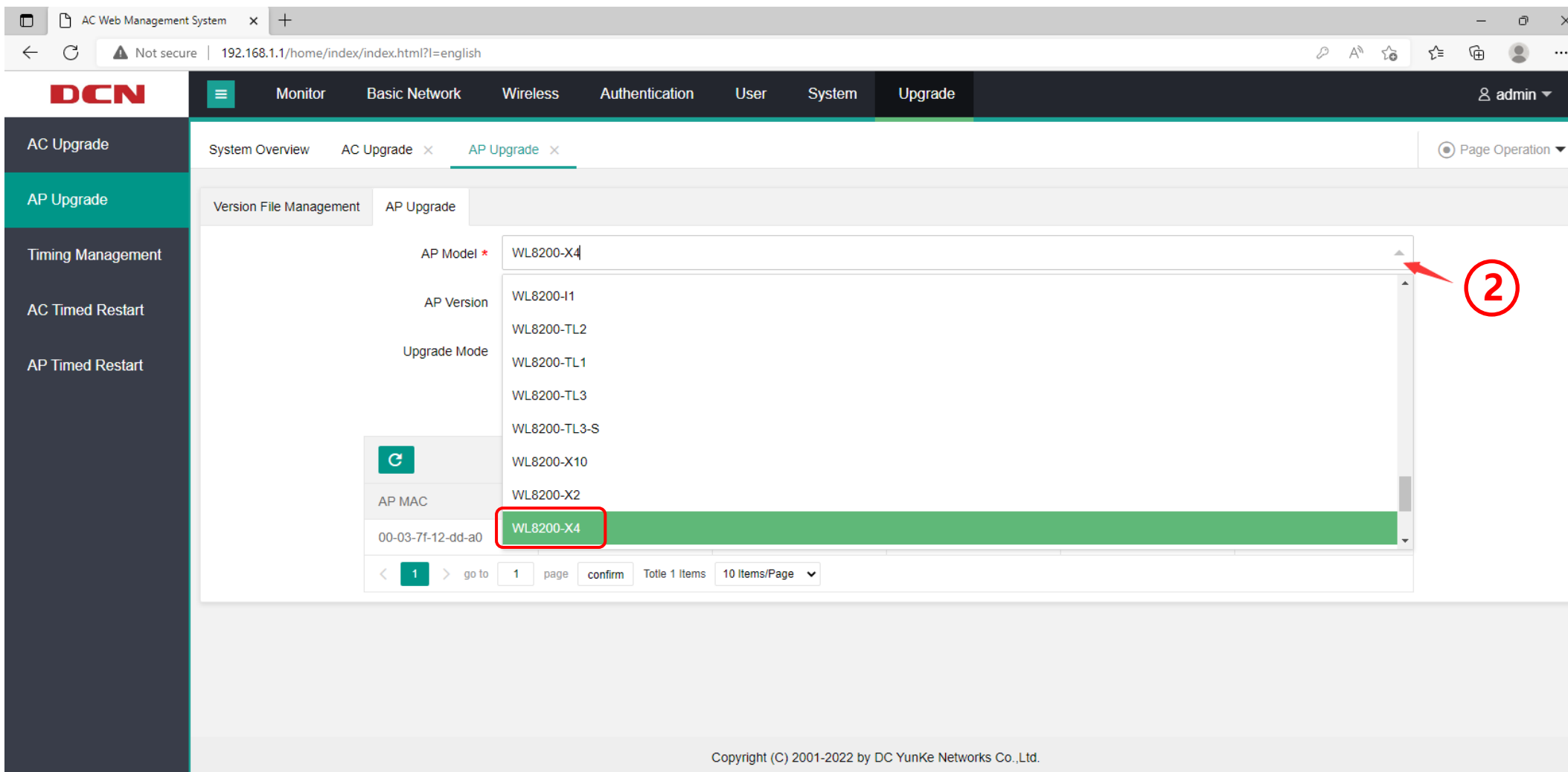
The screenshot shows the DCN AC Web Management System interface. The left sidebar contains the following menu items: AC Upgrade, AP Upgrade (highlighted), Timing Management, AC Timed Restart, and AP Timed Restart. The main content area is titled 'AP Upgrade' and includes a 'Submit' button. Below the form, a table lists the APs to be upgraded:

AP MAC	AP IP	AP Model	AP Group	AP Version	Upgrade Status
00-03-7f-12-dd-a0	192.168.1.10	WL8200-X4	Default	4.1.1.49	Not upgraded

The table shows 1 item, with 10 items per page. The footer indicates Copyright (C) 2001-2022 by DC YunKe Networks Co., Ltd.

Upgrade AP firmware on AC Web

Select target AP firmware to be upgraded on AC web



The screenshot shows the DCN AC Web Management System interface. The top navigation bar includes tabs for Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The left sidebar shows the AC Upgrade section with sub-items: AP Upgrade, Timing Management, AC Timed Restart, and AP Timed Restart. The main content area is titled 'AP Upgrade' and contains a form for selecting the target AP firmware. The 'AP Model' dropdown is open, showing a list of models: WL8200-I1, WL8200-TL2, WL8200-TL1, WL8200-TL3, WL8200-TL3-S, WL8200-X10, WL8200-X2, and WL8200-X4. The 'WL8200-X4' option is highlighted in green and circled with a red box. A red circle with the number 2 points to the dropdown list. The bottom of the page shows the copyright information: Copyright (C) 2001-2022 by DC YunKe Networks Co., Ltd.

Upgrade AP firmware on AC Web

Confirm firmware version selected on AC web

DCN

Monitor

Basic Network

Wireless

Authentication

User

System

Upgrade

AC Upgrade

AP Upgrade

Timing Management

AC Timed Restart

AP Timed Restart

System Overview

AC Upgrade

AP Upgrade

Page Operation

Version File Management

AP Upgrade

AP Model *

WL8200-X4

3

AP Version

WL-8200-X4_4.1.1.47.tar

Upgrade Mode

☒ Upgrade Now

☐ Upgrade Regular

Submit

4

AP MAC

AP IP

AP Model

AP Group

AP Version

Upgrade Status

00-03-7f-12-dd-a0

192.168.1.10

WL8200-X4

Default

4.1.1.49

Not upgraded

<

1

>

go to

1

page

confirm

Totie 1 Items

10 Items/Page

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Upgrade AP firmware on AC Web

Confirm AP status after upgrading on AC web

AC Web Management System

192.168.1.1/home/index/index.html?l=english

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

AC Upgrade

AP Upgrade

Timing Management

AC Timed Restart

AP Timed Restart

System Overview AC Upgrade x AP Upgrade x

Version File Management AP Upgrade

AP Model * WL8200-X4

AP Version WL-8200-X4_4.1.1.47.tar

Upgrade Mode ☒ Upgrade Now ☐ Upgrade Regular

Submit

Refresh button

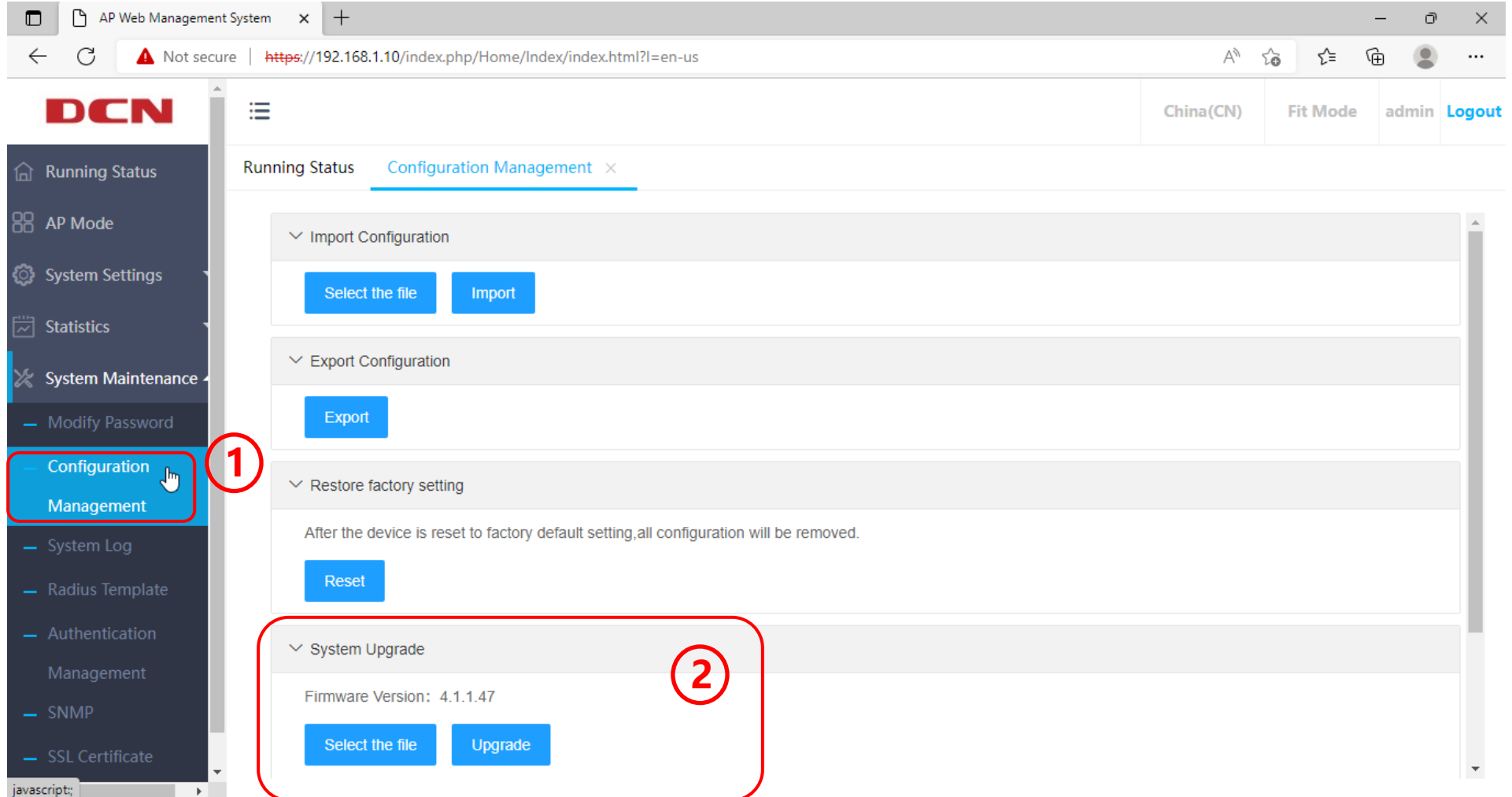
AP MAC	AP IP	AP Model	AP Group	AP Version	Upgrade Status
00-03-7f-12-dd-a0	192.168.1.10	WL8200-X4	Default	4.1.1.47	Upgrade successful

< 1 > go to 1 page confirm Totle 1 Items 10 Items/Page

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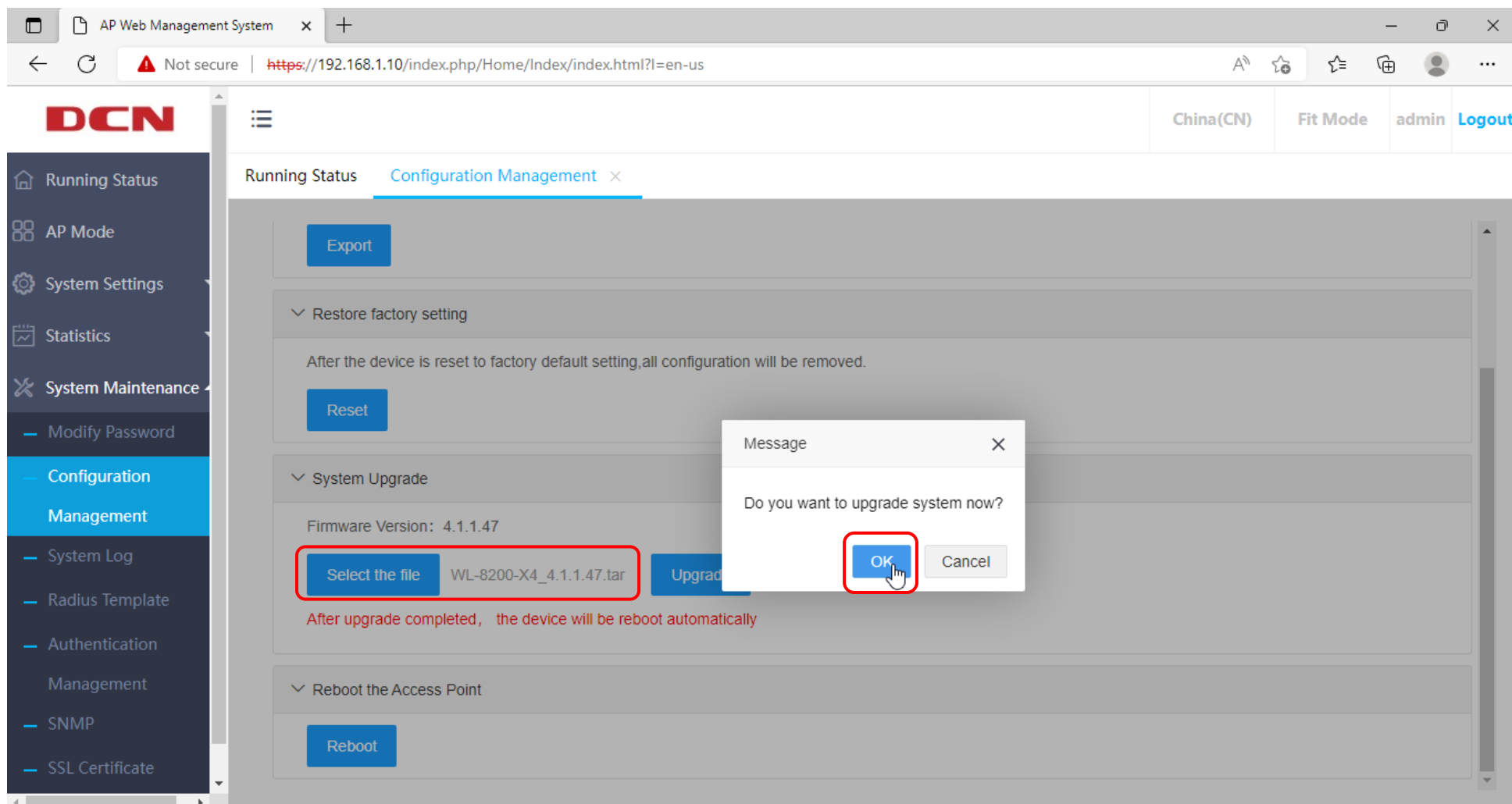
Upgrade AP firmware on AP Web

Select and Upload target AP firmware to AP web



Upgrade AP firmware on AP Web

Confirm firmware version and upgrade on AP web



Upgrade AP firmware on AP Web

Writing firmware to AP

The screenshot shows a web browser window with the title "AP Web Management System". The address bar displays "https://192.168.1.10/index.php/Home/Index/index.html?l=en-us". The page features a sidebar menu on the left with the DCN logo at the top. The menu items include: Running Status, AP Mode, System Settings, Statistics, System Maintenance, Modify Password, Configuration Management (highlighted in blue), System Log, Radius Template, Authentication Management, SNMP, and SSL Certificate. The main content area has tabs for "Running Status" and "Configuration Management". A red-bordered box contains the following text:

New firmware image has been uploaded to the AP. AP will change the firmware image and reboot.

The AP cannot be accessed during the process of upgrading. Please do not shut down the AP during the process of upgrading. After upgrading the AP can be accessed.

Upgrading, please do not refresh or close the page, the process of upgrading will take about 4-6 minutes, please wait a moment.

After the reboot is completed, it will skip to the login page automatically. The current configuration will not be lost and will still take effect after the upgrade.

If the address of AP changes, you need to visit the new IP address manually.

Below the text is a progress bar that is approximately 30% full.

Introduction of user manual - Common Wireless Product Manual

Manual Name	Version	Description
DCWS-6028(R2) Smart Wireless Integrated Controller Web Operation Manual	v3.1.1	DCWS-6028C and DCWS-6028R2 refer to it.
DCWS-6028(R2) Smart Wireless Integrated Controller Function Commands Manual	v3.1.1	DCWS-6028C and DCWS-6028R2 refer to it.
DCWS-6028(R2) Smart Wireless Integrated Controller Function Operation Manual	v3.1.1	DCWS-6028C and DCWS-6028R2 refer to it.
DCN Wireless AP Web Operation Manual	v1.8	All AP models refer to it.

01

Basic operation of WLAN product

- **Basic management of AC & AP**
- **Upgrade AC & AP firmware**
- **Prepare & Install license on AC**

How to prepare AP license for DCWS-6028

Collect license SN, valid code and AC information, send to dcn_technicians@digitalchina.com



产品的实际情况填写下面表格:

产品信息:

升级专用授权许可产品

号: DCWS-L32

号: WL000110M804000017

1659-6047-4073-9420

年 月 日

制器产品型号、产品序列号及 MAC

SN & Valid Code

DCWS-L16
DCWS-L32
DCWS-L128

DCWS-6028#**show device information**
Controller serial number:SW050710H804000079
Controller mac:00-03-0f-90-81-6b

How to install and check AP license – AC Web

Select target lic file and upload to AC web

The screenshot displays the DCN AC Web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System' (highlighted), and 'Upgrade'. The left sidebar contains various management options, with 'License Management' highlighted. The main content area shows the 'License Management' page with tabs for 'System Overview', 'AC Upgrade', 'Cloud Management Settings', and 'License Management' (selected). The 'License Information' table lists details for a device named DCWS-6028. Below this, there is a table for license files, currently showing 'null'. The 'Upload File' button is highlighted in the bottom left of the license management section.

License Information	
Device Name	DCWS-6028
MAC Address	00-03-0f-90-81-6b
S/N	SW050710H804000079
Used/Authorized Total	8/64

License File Name	Authorized Number	Operation
null		

Upload File **Save**

How to install and check AP license – AC Web

Check uploaded lic files on AC web

			
License File Name	Authorized Number	Operation	
sunkz_512_1.lic	512		
sunkz_512_2.lic	512		
sunkz_512_3.lic	512		

Upload File

Save

AC rebooting is required after installing new AP license

How to install AP license – AC CLI

Upload lic file to AC

```
DCWS-6028#copy license ?
```

WORD Copy source file name(local-filename or ftp://user:password@ip|host-name/remote-filename or tftp://ip|host-name/remote-filename)

```
DCWS-6028#
```

```
DCWS-6028#copy license tftp://172.30.78.13/6028r1-new-128.lic 6028r1-new-128.lic
```

Begin to receive file, please wait...

File transfer complete.

Recv total 48 bytes

Please wait as the new firmware is loaded. It may take a few minutes. Please do not reboot during this period until the process shows that it is completed.

License Install Success!

Write ok.

close tftp client.

```
DCWS-6028#
```

How to check AP license – AC CLI

Check lic files uploaded to AC

```
DCWS-6028#dir
```

```
-rwx    48      6028-2.lic
-rwx    48      6028r1-new-128.lic
-rwx   256      boot.conf
-rwx   255      bootip.conf
-rwx   2.8K      chenjj.cfg
-rwx   3.2K      client.pem
--rwx  15.5M      nos.img
-rwx  482.7K      nos.img.ecc
-rwx    24      portal-locale.cfg
-rwx   1.7K      startup.cfg
-rwx   3.2K      startup.cfg_fangcheng
-rwx   1.8K      vendor.cfg.ecc
-rwx   52.8K      verdor.cfg
-rwx   1.4K      wangxjaf.cfg
-rwx    932      wlan.pem
-rwx   245      wsdh1024.pem
-rwx   156      wsdh512.pem
-rwx   928      wssl2_cert.pem
-rwx   916      wssl2_key.pem
```

```
Drive : flash:
```

```
Size:26.5M Used:16.2M Available:10.3M Use:61%
```

How to install CLI license for DCWS-6028-C

Collect AC information by "show device information" , send to dcn_technicians@digitalchina.com

```
DCWS-6028-C#config
```

Not support CLI CONFIG, please contact vendor if needed!

```
DCWS-6028-C#copy tftp://192.168.1.100/00-03-0f-e0-fe-  
f4_WL023410M115000024_configCtrl.licx configCtrl.licx
```

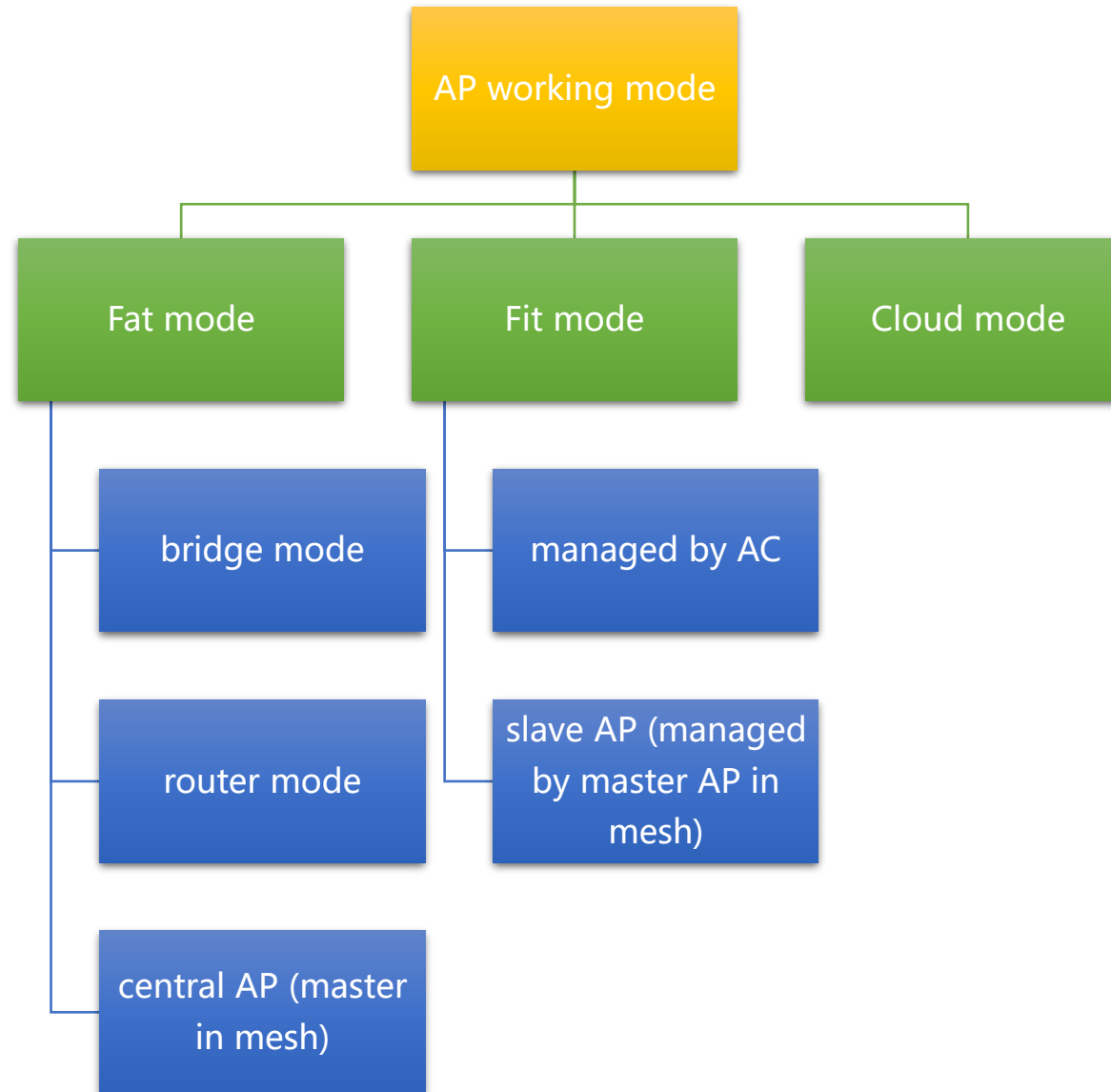
CLI license works immediately, AC rebooting is not required

02

Deployment Scenarios of WLAN product

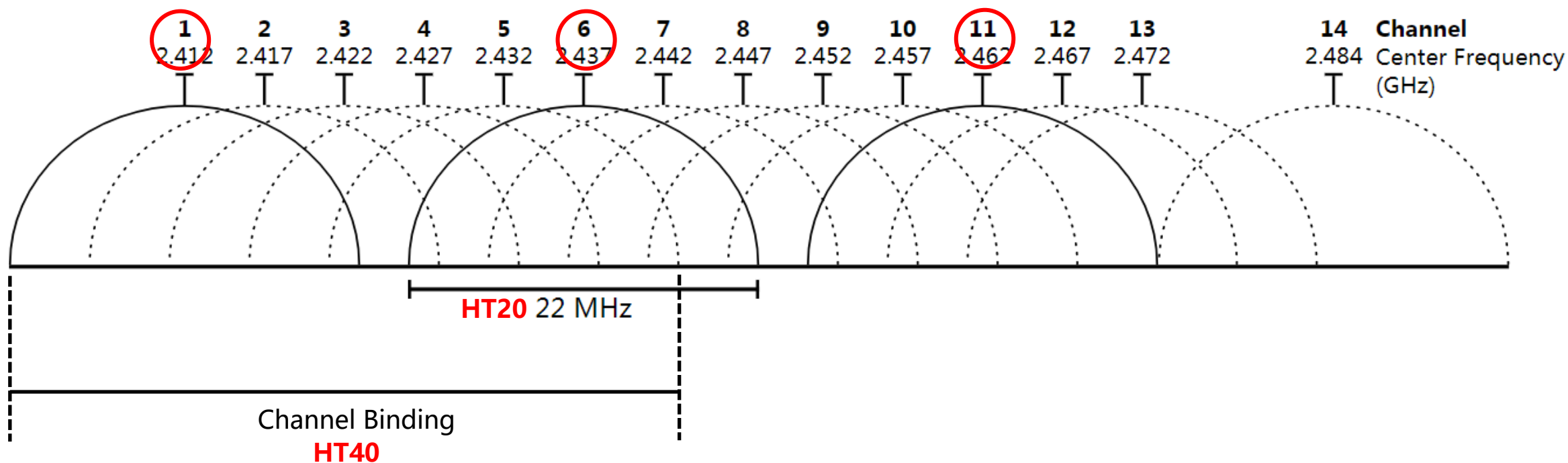
- **FAT AP networking**
- **AP mesh networking**
- **FIT AP + AC simple layer-2 networking**
- **FIT AP + AC recommended layer-3 networking**
- **Cloud AP networking**

WLAN basic concept and terms

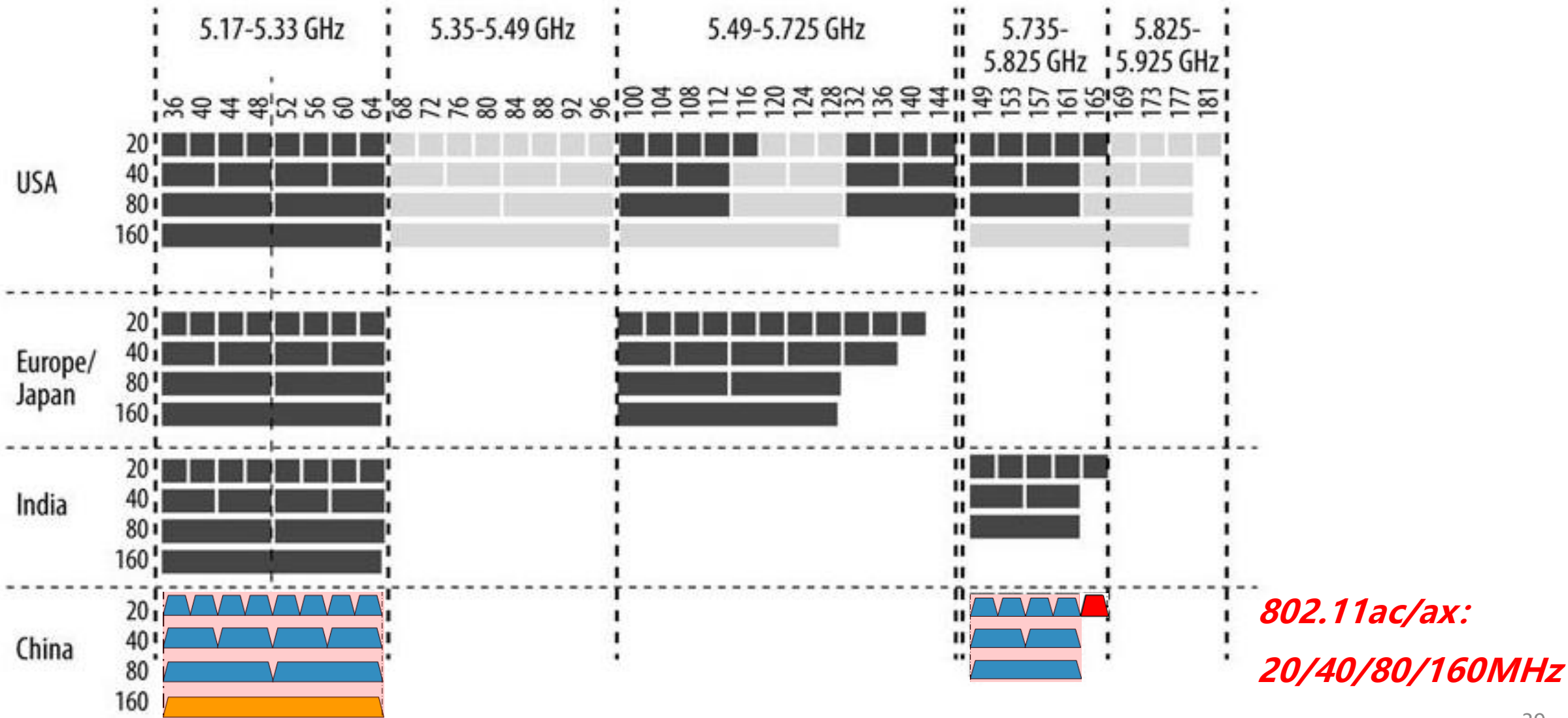


2.4GHz Radio

Independent Channels



5GHz Radio



802.11ac/ax:
20/40/80/160MHz

Channel binding

- After Channel Binding, the number of available channels is reduced

2.4GHz 20MHz bandwidth

Supported Channels (* = Auto Eligible)

1*	2	3	4	5	6*	7	8
9	10	11*	12	13			

2.4GHz 40MHz bandwidth

Supported Channels (* = Auto Eligible)

1*	2*	3*	4*	5*	6*	7*	8*
9*							

5GHz 20MHz bandwidth

Supported Channels (* = Auto Eligible)

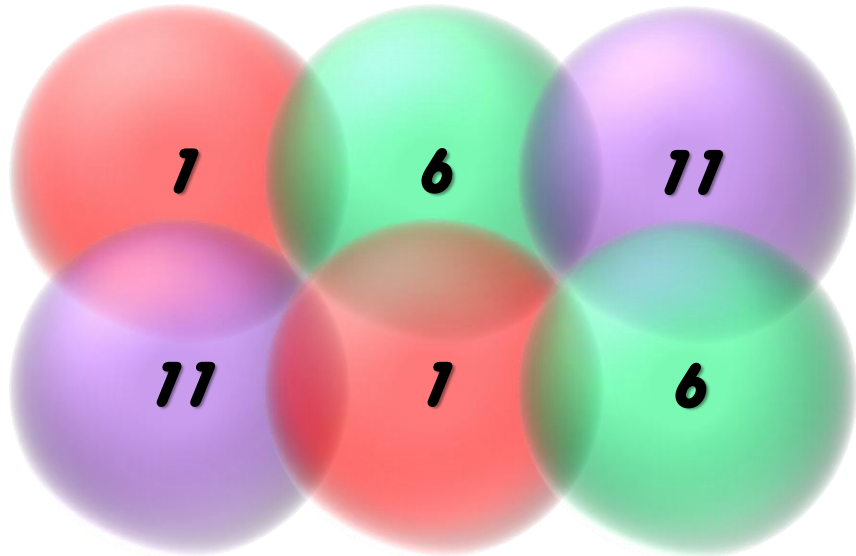
36*	40*	44*	48*	52*	56*	60*	64*
149*	153*	157*	161*	165*			

5GHz 40MHz bandwidth

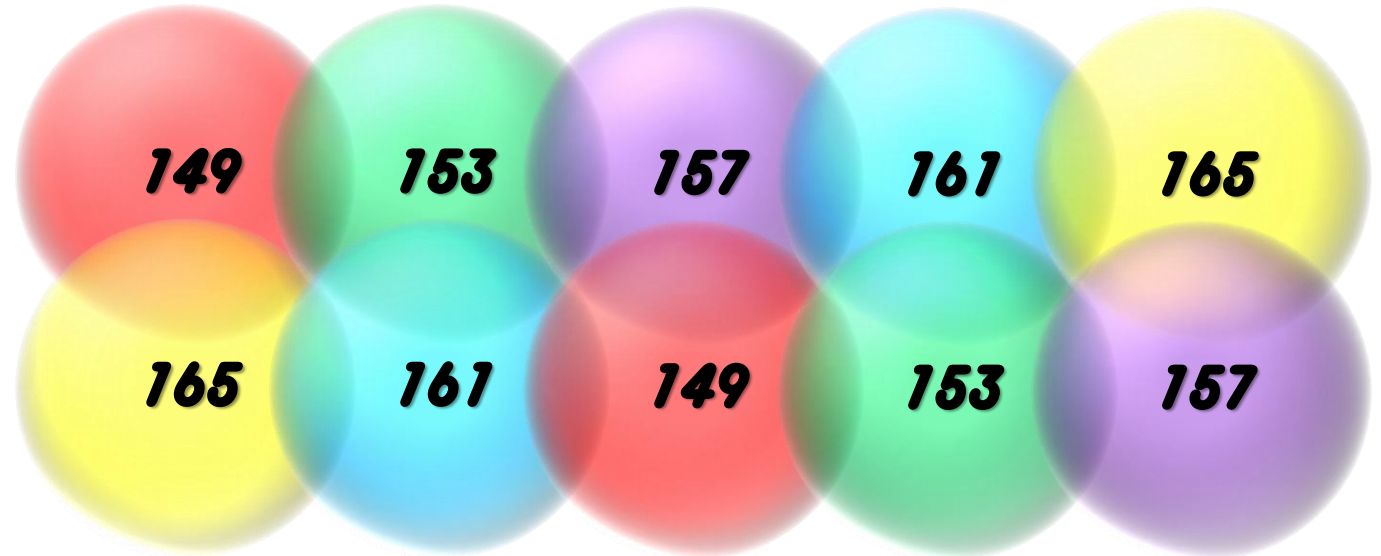
Supported Channels (* = Auto Eligible)

36*	44*	52*	60*	149*	157*
-----	-----	-----	-----	------	------

Channel Adjustment

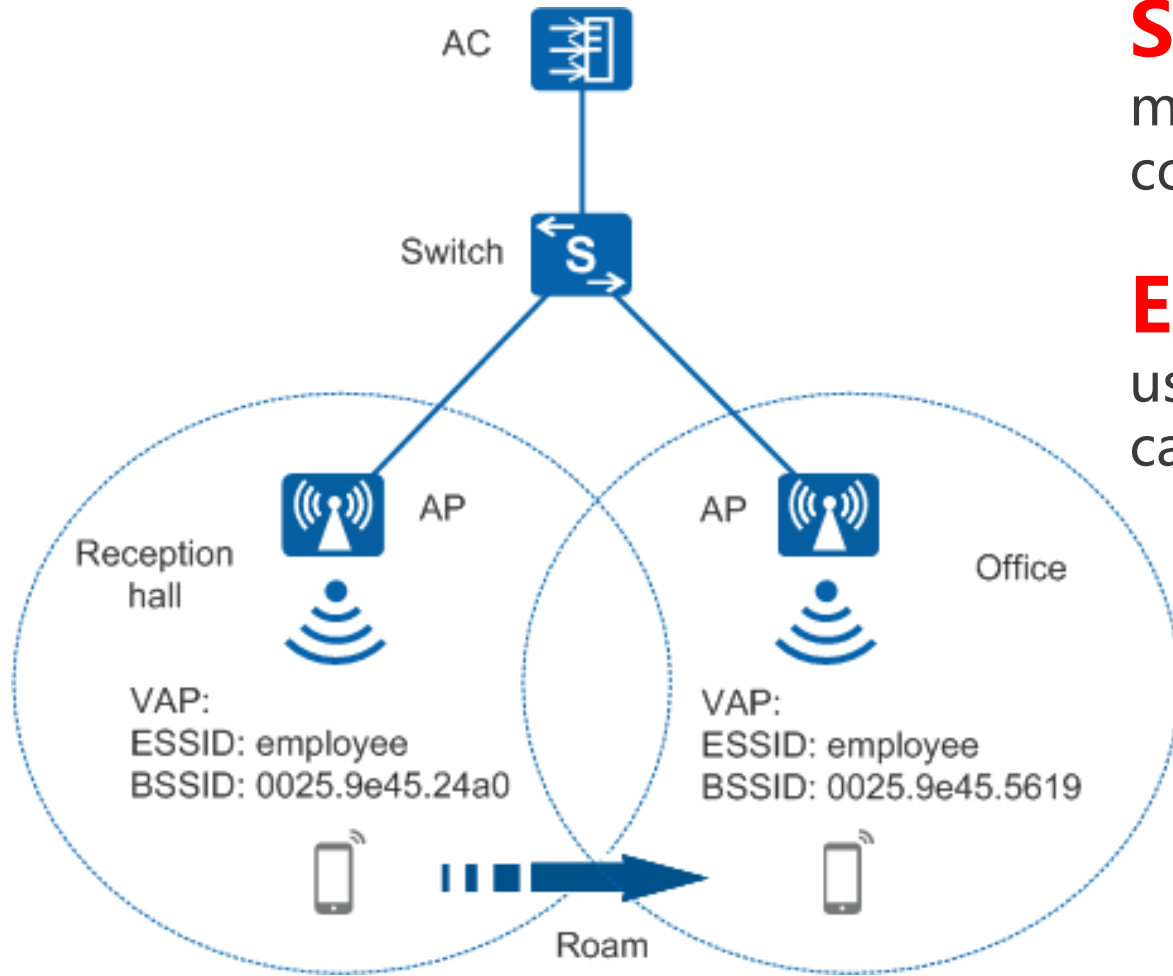


**2.4GHz
Allocation**



**5.8GHz
Allocation**

ESSID and BSSID



SSID is the abbreviation of Service Set Identifier, mainly used to identify the wireless networks. SSID contains ESSID and BSSID.

ESSID (extended service set identifier) is used to distinguish different networks and can have up to 32 characters.

BSSID is the MAC address of the wireless router (essentially a MAC address)

AP online process



- ✓ Private protocol type **0x88e8**
- ✓ **UDP** protocol packet with destination **port 57776** from AP or AC

- ✓ Need AC can support the type of AP
- ✓ AP actively establishes TCP connection to the port 57777 of AC and will be identified by AC
- ✓ Correct AP authentication

- ✓ TCP connection between AC and AP should be keep-alive
- ✓ **TCP** protocol packet with source **port 57777** from AC

AC discover AP in Layer-2 networks



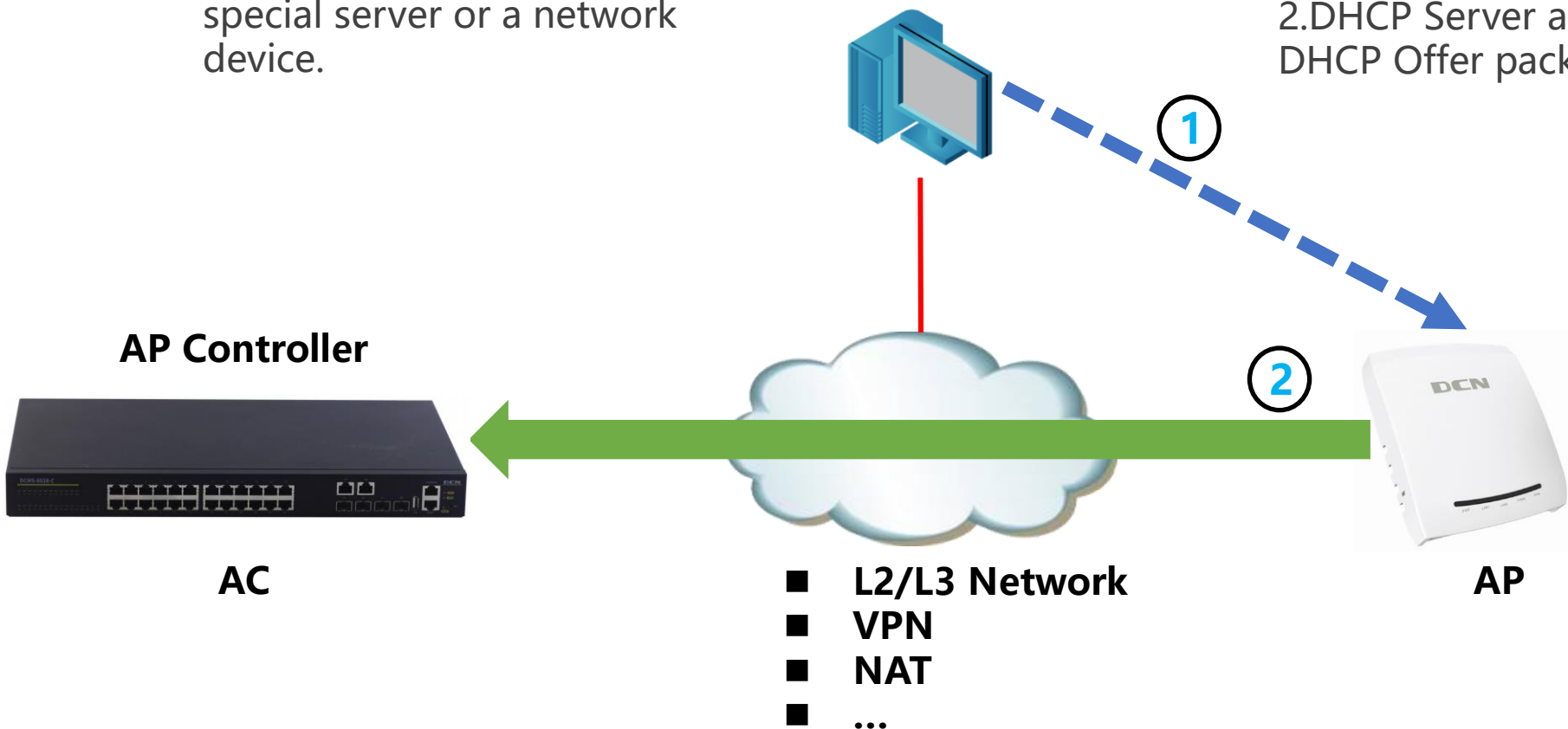
- ◆ AC sends a layer-2 broadcast packet with private protocol type **0x88e8** every 30 seconds, and its data field carries the IP address information of AC.
- ◆ By default, AC sends the packet in VALN 1 only.
- ◆ The characteristic of L2 network is that AC and AP can learn each other's MAC address directly.
- ◆ After AP receives the packet, it will parse the IP address of AC from the data field of the packet, so as to further establish a TCP connection with AC.

AP discover AC

The DHCP Server may be a special server or a network device.

DHCP Server

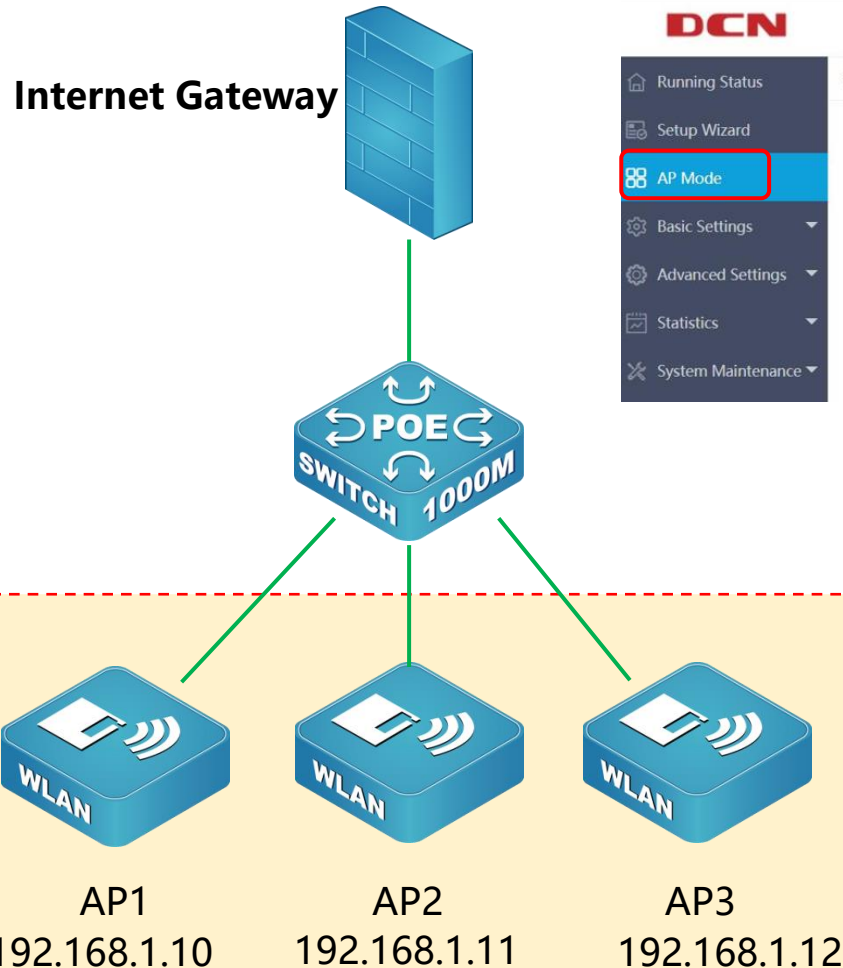
1. AP request IP address from DHCP Server;
2. DHCP Server add AC IP address to Option 43 in DHCP Offer packet to AP.



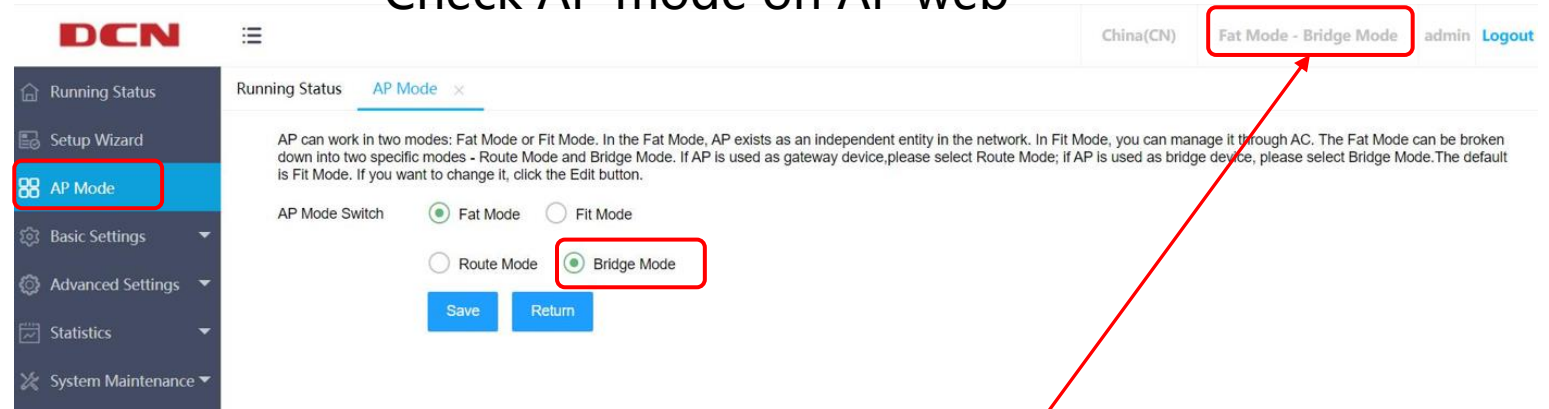
APs can get their own IP address and also the IP address of controller. Then AP will start to discover the controller and register.

- **FAT AP networking**
- **AP wired mesh networking**
- **FIT AP + AC simple layer-2 networking**
- **FIT AP + AC recommended layer-3 networking**
- **Cloud AP networking**

FAT AP networking – FAT AP Bridge mode



Check AP mode on AP web



current working mode is displayed here

Required configuration on FAT AP:

- ◆ Each AP has a different management IP address.
- ◆ Set the correct country code.
- ◆ Set the SSID required by the customer.
- ◆ Set the wireless service VLAN.

FAT AP networking – FAT AP Bridge mode

Configure IP address on AP

The image displays two screenshots of the DCN web interface, illustrating the configuration of IP address on an AP in Bridge mode.

Left Screenshot (DHCP Configuration):

- Uplink Settings:**
 - Management VLAN: 1
 - Untagged VLAN: 1
 - Connection Type:** DHCP (highlighted with a red box)
 - IP Address: 172.30.78.12
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 172.30.78.1
 - DNS Server: 202.103.44.150
 - IPv6 Connection Type: DHCP
 - IPv6 Address: (empty)
 - IPv6 Address Prefix Length: (empty)
 - Default IPv6 Gateway: (empty)
 - IPv6 DNS Server: (empty)
- Downlink Settings:**
 - VLAN ID: 1
 - Edit** button (highlighted with a red box)

Right Screenshot (Static IP Configuration):

- Uplink Settings:**
 - Management VLAN: 1
 - Untagged VLAN: 1
 - Connection Type:** Static IP (highlighted with a red box)
 - IP Address: 172.30.78.12
 - Subnet Mask: 255.255.255.0
 - Default Gateway: 172.30.78.1
 - DNS Server: 202.103.44.150
 - IPv6 Connection Type: DHCP (selected), Static IP (unselected)
 - IPv6 Address: ::
 - IPv6 Address Prefix Length: (empty)
 - Default IPv6 Gateway: ::
 - IPv6 DNS Server: ::
- Downlink Settings:**
 - VLAN ID: 1
 - Save** button (highlighted with a red box)
 - Return** button

FAT AP networking – FAT AP Bridge mode

Set country code on AP

DCN

China(CN)

Fat Mode - Bridge Mode

admin

Logout

Running Status

Setup Wizard

AP Mode

Basic Settings

Ethernet Settings

Wireless Settings

Advanced Settings

Statistics

System Maintenance

Running Status

Wireless Settings

Add

SSID	Vlan ID	Radio Enable	Client Isolation	Hidden SSID	WDS Mode	Multicast To Unicast	Security Setting	Operation
DCN_WLAN	1	2.4G/5G	Off	Off	Disabled	Off	Open	Edit Delete

Country Code Settings

Country Code

China

Save

FAT AP networking – FAT AP Bridge mode

Add new SSID on AP

DCN

Running Status

Setup Wizard

AP Mode

Basic Settings

Ethernet Settings

Wireless Settings

Advanced Settings

Statistics

System Maintenance

Running Status

Wireless Settings

Add

1

SSID	Vlan ID	Radio Enable
DCN_WLAN	1	2.4G/5G

Country Code Settings

Country CodeChina

Unicast

Security Setting

Operation

Open

Edit

Delete

2

Message

SSIDPlease Input SSID

VLAN IDPlease Input VLAN ID

Radio☒ 2.4G☒ 5G

Client Isolation☐ On☒ Off

Hidden SSID☐ On☒ Off

WDS Mode☐ Enabled☒ Disabled

Multicast To Unicast☐ On☒ Off

Security SettingOpen

Speed Limit Mode☒ SSID Speed Limit☐ Client Speed Limit

Uplink Speed Limit(kBps)Please Input Uplink Speed Limit(Range:0-524286)(Optional)

Downlink Speed Limit(kBps)Please Input Downlink Speed Limit(Range:0-524286)(Optional)

Save

FAT AP networking – FAT AP Bridge mode

Configure service VLAN ID and user authentication method on AP

DCN

China(CN)

Fat Mode - Bridge Mode

admin

Logout

Running Status

Setup Wizard

AP Mode

Basic Settings

Ethernet Settings

Wireless Settings

Advanced Settings

Statistics

System Maintenance

Running Status

Wireless Settings

Add

SSID	Vlan ID	Radio Enable
DCN_WLAN	1	2.4G/5G

Country Code Settings

Country Code

China

Message

SSID*

Please Input SSID

VLAN ID*

Please Input VLAN ID

Radio*

☒ 2.4G

☒ 5G

Client Isolation*

☐ On

☒ Off

Hidden SSID*

☐ On

☒ Off

WDS Mode*

☐ Enabled

☒ Disabled

Multicast To Unicast*

☐ On

☒ Off

Security Setting*

Open

Speed Limit Mode*

Uplink Speed Limit(kBps)

Downlink Speed Limit(kBps)

Security Configuration

Open

WPA/WPA2-Personal

WPA/WPA2-Enterprise

WPA3-Open-Transition

WPA2/WPA3-Personal

WPA2/WPA3-Enterprise

Unicast	Security Setting	Operation
	Open	Edit Delete

3

4

FAT AP networking – FAT AP Bridge mode

Check radio setting on AP

DCN

China(CN) Fat Mode - Bridge Mode admin Logout

Running Status Radio Settings ×

Radio	Status	Mode	Channel Bandwidth	Channel	Transmit Power(dBm)	Multicast Rate(Mbps)	STBC Mode	Beacon Interval	DTIM Period	RTS Threshold	Max Clients	Operation
2.4G	Enabled	802.11axg	HT20	11	28	auto	Enabled	100	1	2346	400	Edit
5G	Enabled	802.11axa	HT40	149	27	auto	Enabled	100	1	2346	400	Edit

Running Status

- Running Status
- Setup Wizard
- AP Mode
- Basic Settings
- Advanced Settings
- Radio Settings
- WDS Settings
- Statistics
- System Maintenance

FAT AP networking – FAT AP Bridge mode

Configure radio parameters

DCN

Running Status

Setup Wizard

AP Mode

Basic Settings

Advanced Settings

Radio Settings

WDS Settings

Statistics

System Maintenance

China(CN)

Fat Mode - Bridge Mode

admin

Logout

Running Status

Radio Settings

Radio	Status	Mode	Channel Bandwidth	Channel	Transmit Power(dBm)	Multicast Rate(Mbps)	STBC Mode	Beacon Interval	DTIM Period	RTS Threshold	Max Clients	Operation
2.4G	Enabled	802.11axg	HT20						1	2346	400	Edit
5G	Enabled	802.11axa	HT40						1	2346	400	Edit

Radio Settings

Status

Enabled

Disabled

Mode

802.11axa

Channel Bandwidth

HT40

Channel

auto

Transmit Power

27

Multicast Rate

auto

STBC Mode

Enabled

Disabled

Beacon Interval

100

DTIM Period

1

RTS Threshold

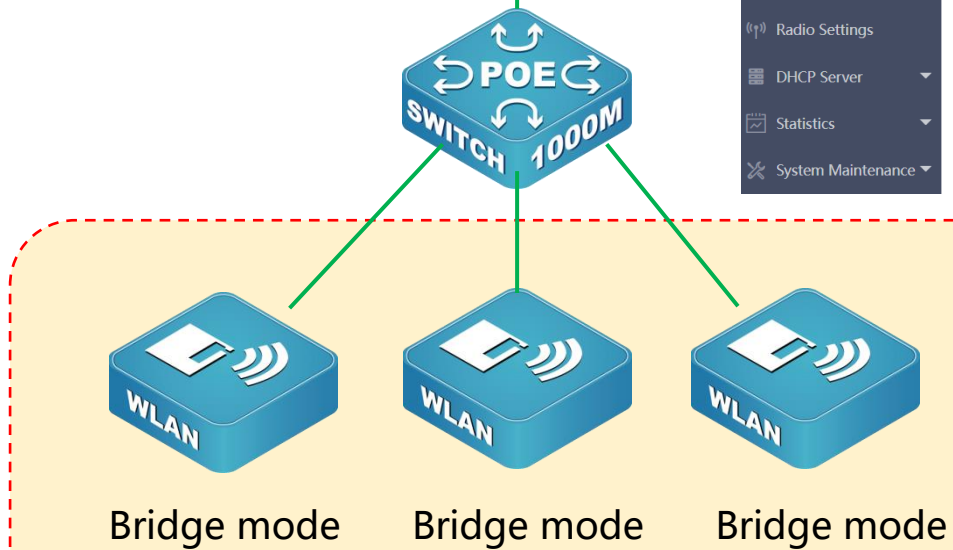
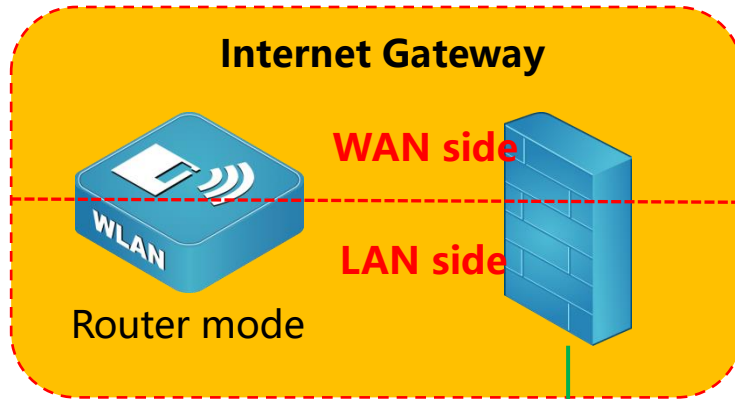
2346

Max Clients

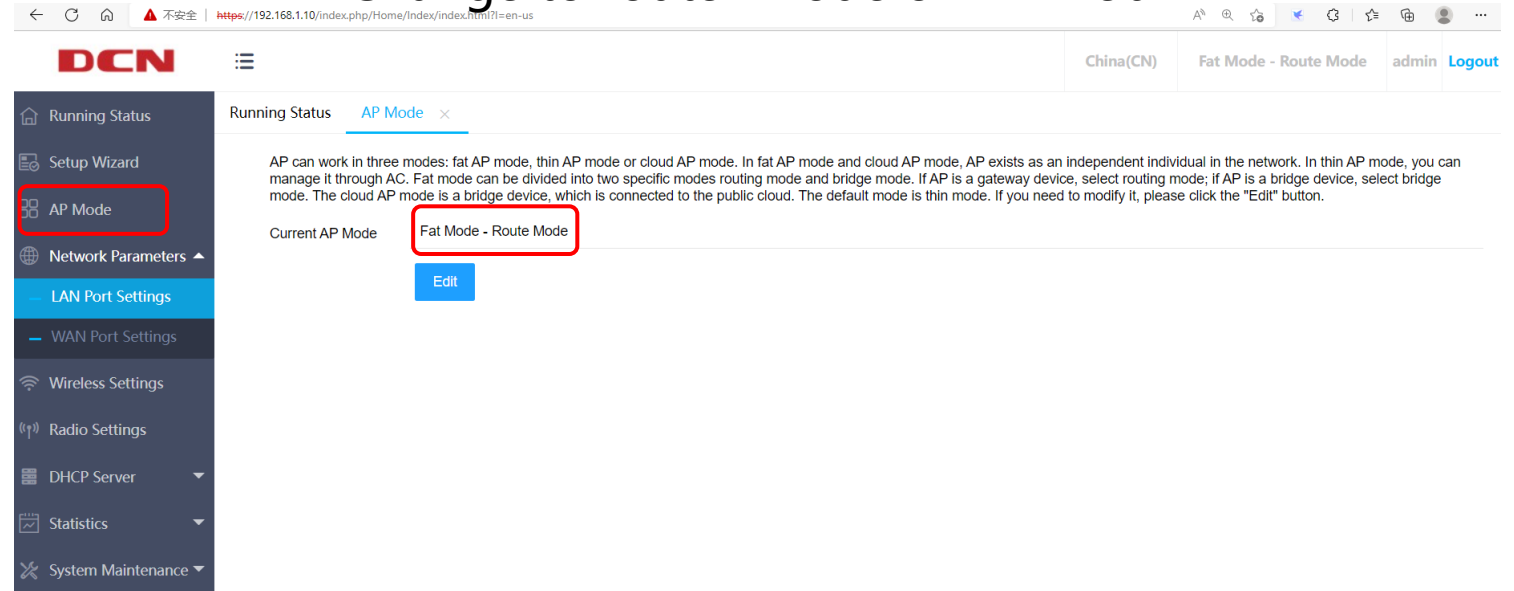
400

Save

FAT AP networking – FAT AP Router mode



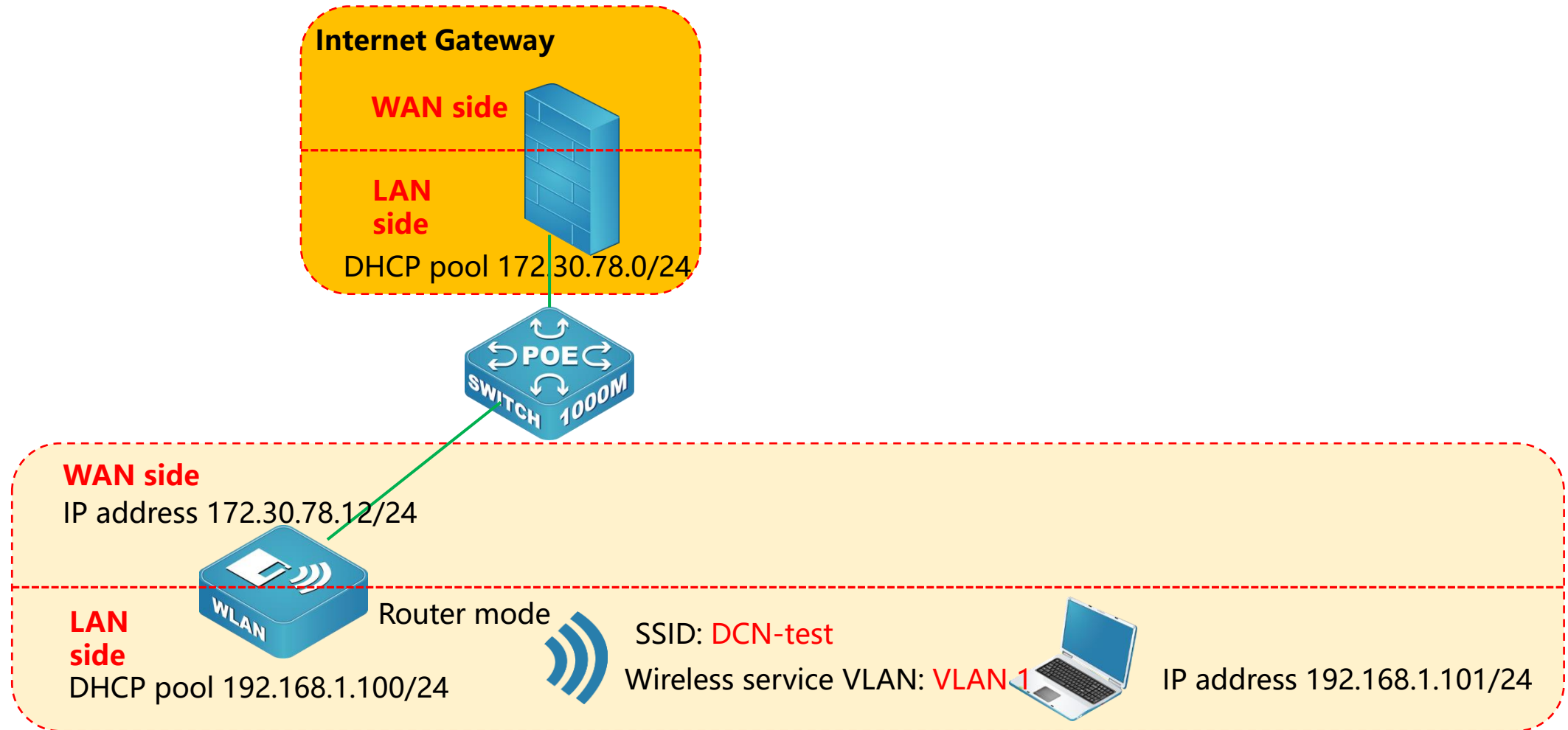
Change to router mode on AP web



Compared with the bridge mode, the router mode adds the following functions:

- ◆ NAT function from LAN side to WAN side.
- ◆ The PPPoE dialing function on the WAN side.
- ◆ DHCP server function on the LAN side.

FAT AP networking – FAT AP Router mode



FAT AP networking – FAT AP Router mode

Change working mode on AP

The screenshot shows the DCN web interface for configuring an AP. The left sidebar contains navigation links: Running Status, AP Mode (selected), System Settings, Statistics, and System Maintenance. The main content area is titled 'Running Status' and 'AP Mode'. It includes a descriptive paragraph about AP modes and a section for 'AP Mode Switch' with four radio buttons: Fat Mode (selected), Fit Mode, Cap Mode, and Route Mode (selected). Below these are 'Save' and 'Return' buttons. A 'Message' dialog box is open, displaying a warning: 'Switching the AP mode will restart the device. After switching to Route Mode, the device can only be managed by accessing the web page through the wireless or lan port. Do you confirm the preservation?' with 'OK' and 'Cancel' buttons.

DCN

China(CN) Fit Mode admin Logout

Running Status AP Mode

AP can work in three modes: fat AP mode, thin AP mode or cloud AP mode. In fat AP mode and cloud AP mode, AP exists as an independent individual in the network. In thin AP mode, you can manage it through AC. Fat mode can be divided into two specific modes routing mode and bridge mode. If AP is a gateway device, select routing mode; if AP is a bridge device, select bridge mode. The cloud AP mode is a bridge device, which is connected to the public cloud. The default mode is thin mode. If you need to modify it, please click the "Edit" button.

AP Mode Switch

☒ Fat Mode ☐ Fit Mode ☐ Cap Mode

☒ Route Mode ☐ Bridge Mode

Save Return

Message

Switching the AP mode will restart the device. After switching to Route Mode, the device can only be managed by accessing the web page through the wireless or lan port. Do you confirm the preservation?

OK Cancel

FAT AP networking – FAT AP Router mode

Configure IP address for AP downlink port

The screenshot shows the DCN web interface. The browser address bar displays `https://192.168.1.10/index.php/Home/Index/index.html?l=en-us`. The interface includes a top navigation bar with the DCN logo, a language selector set to 'China(CN)', a mode selector set to 'Fat Mode - Route Mode', and a user profile 'admin' with a 'Logout' link. A left sidebar contains a menu with items: Running Status, Setup Wizard, AP Mode, Network Parameters (expanded), LAN Port Settings (highlighted with a red box), WAN Port Settings, Wireless Settings, Radio Settings, DHCP Server, Statistics, and System Maintenance. The main content area has tabs for 'Running Status', 'AP Mode', and 'LAN Port Settings' (selected). Below the tabs, a red-bordered box contains the text: 'This page shows the basic network parameters of LAN port.' Below this box is a table with two rows: 'IP Address' with value '192.168.1.10' and 'Subnet Mask' with value '255.255.255.0'. An 'Edit' button is located below the table.

This page shows the basic network parameters of LAN port.	
IP Address	192.168.1.10
Subnet Mask	255.255.255.0

[Edit](#)

Note:

In routing mode, the uplink port of the AP becomes a WAN port. If the debugging computer is connected to the WAN port, it cannot access the default IP address on the LAN side..

FAT AP networking – FAT AP Router mode

Configure DHCP service on AP

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DCN

☰

China(CN)Fat Mode - Route ModeadminLogout

🏠 Running Status

📋 Setup Wizard

🔧 AP Mode

🌐 Network Parameters ▲

— LAN Port Settings

— WAN Port Settings

📶 Wireless Settings

📡 Radio Settings

📄 DHCP Server ▲

— DHCP Server

— Client List

— Static IP Distribution

📊 Statistics ▼

🔧 System Maintenance ▼

Running StatusAP Mode ×LAN Port Settings ×WAN Port Settings ×DHCP Server ×

The DHCP server is built in this device. It can automatically configure the TCP/IP protocol of your computer in LAN.

LAN Port IP Address	192.168.1.10
DHCP Server	Enabled
IP Pool Start Address	192.168.1.100
IP Pool End Address	192.168.1.199
Lease(minutes)	120
Default Gateway	
DNS Server	

Edit

FAT AP networking – FAT AP Router mode

Configure uplink port on AP

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DCN

☰

China(CN)

Fat Mode - Route Mode

admin

Logout

🏠 Running Status

📋 Setup Wizard

🔧 AP Mode

🌐 Network Parameters ▲

— LAN Port Settings

— WAN Port Settings

📶 Wireless Settings

📡 Radio Settings

📄 DHCP Server ▼

📊 Statistics ▼

🔧 System Maintenance ▼

Running Status

AP Mode ×

LAN Port Settings ×

WAN Port Settings ×

This page shows the basic network parameters of WAN port.

MAC Address

00:03:0F:DA:6C:C0

Connection Type

DHCP

IP Address

172.30.78.12

Subnet Mask

255.255.255.0

Default Gateway

172.30.78.1

DNS Server

202.103.24.68

Packet MTU

1500

Edit

FAT AP networking – FAT AP Router mode

Configure uplink connection type

←↻🏠

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DCN

☰

China(CN)

Fat Mode - Route Mode

admin

Logout

🏠 Running Status

📋 Setup Wizard

🔧 AP Mode

🌐 Network Parameters ▲

— LAN Port Settings

— WAN Port Settings

📶 Wireless Settings

📻 Radio Settings

📡 DHCP Server ▲

— DHCP Server

— Client List

— Static IP Distribution

📊 Statistics ▼

🔧 System Maintenance ▼

Running Status

AP Mode ×

LAN Port Settings ×

WAN Port Settings ×

DHCP Server ×

This page shows the basic network parameters of WAN port.

MAC Address

00:03:0F:DA:6C:C0

Connection Type*

DHCP

Static IP

DHCP

PPPoE

IP Address

Subnet Mask

Default Gateway

DNS Server

202.103.24.68

Packet MTU*

1500

Save

Return

FAT AP networking – FAT AP Router mode

Configure PPPoE dial-up connection

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DCN

☰

China(CN)Fat Mode - Route ModeadminLogout

🏠 Running Status

📋 Setup Wizard

🔧 AP Mode

🌐 Network Parameters ▲

— LAN Port Settings

— WAN Port Settings

📶 Wireless Settings

📡 Radio Settings

📡 DHCP Server ▼

📊 Statistics ▼

🔧 System Maintenance ▼

Running StatusWAN Port Settings ×

This page shows the basic network parameters of WAN port.

MAC Address00:03:0F:DA:6C:C0

Connection Type*PPPoE

Internet Account*Please Input Internet Account

Internet Password*Please Input Internet Password

Packet MTU*1492

Save

Return

www.dcnglobal.com

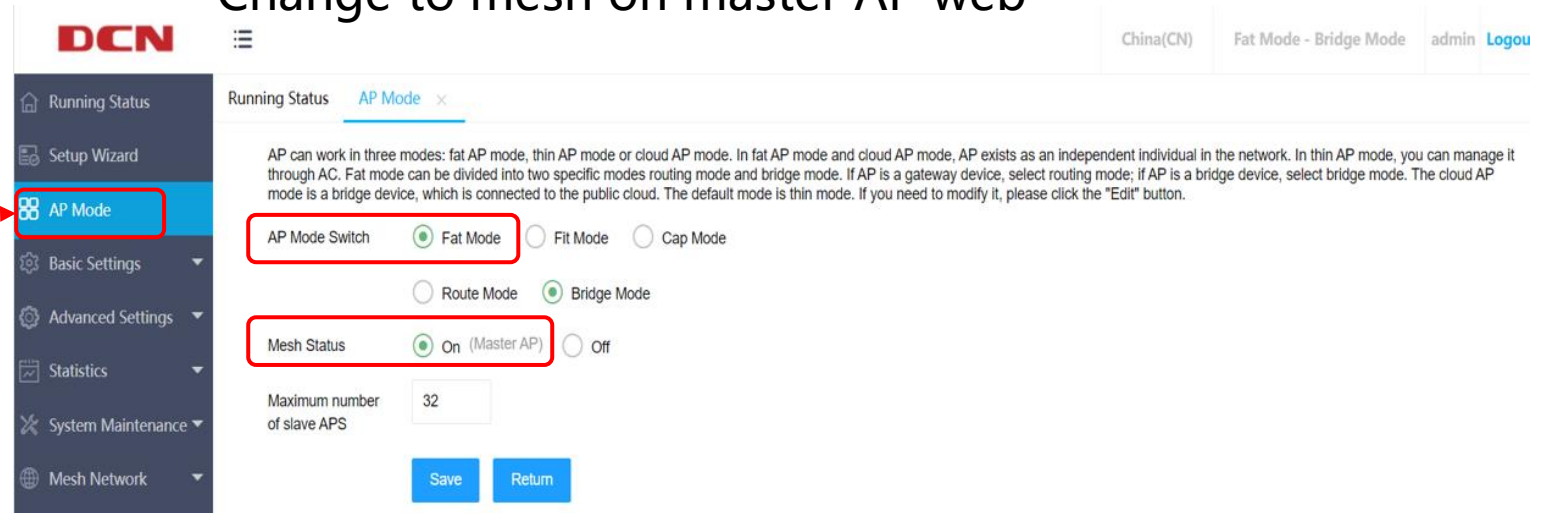
61

- **FAT AP networking**
- **AP wired mesh networking**
- **FIT AP + AC simple layer-2 networking**
- **FIT AP + AC recommended layer-3 networking**
- **Cloud AP networking**

AP wired mesh networking



Change to mesh on master AP web

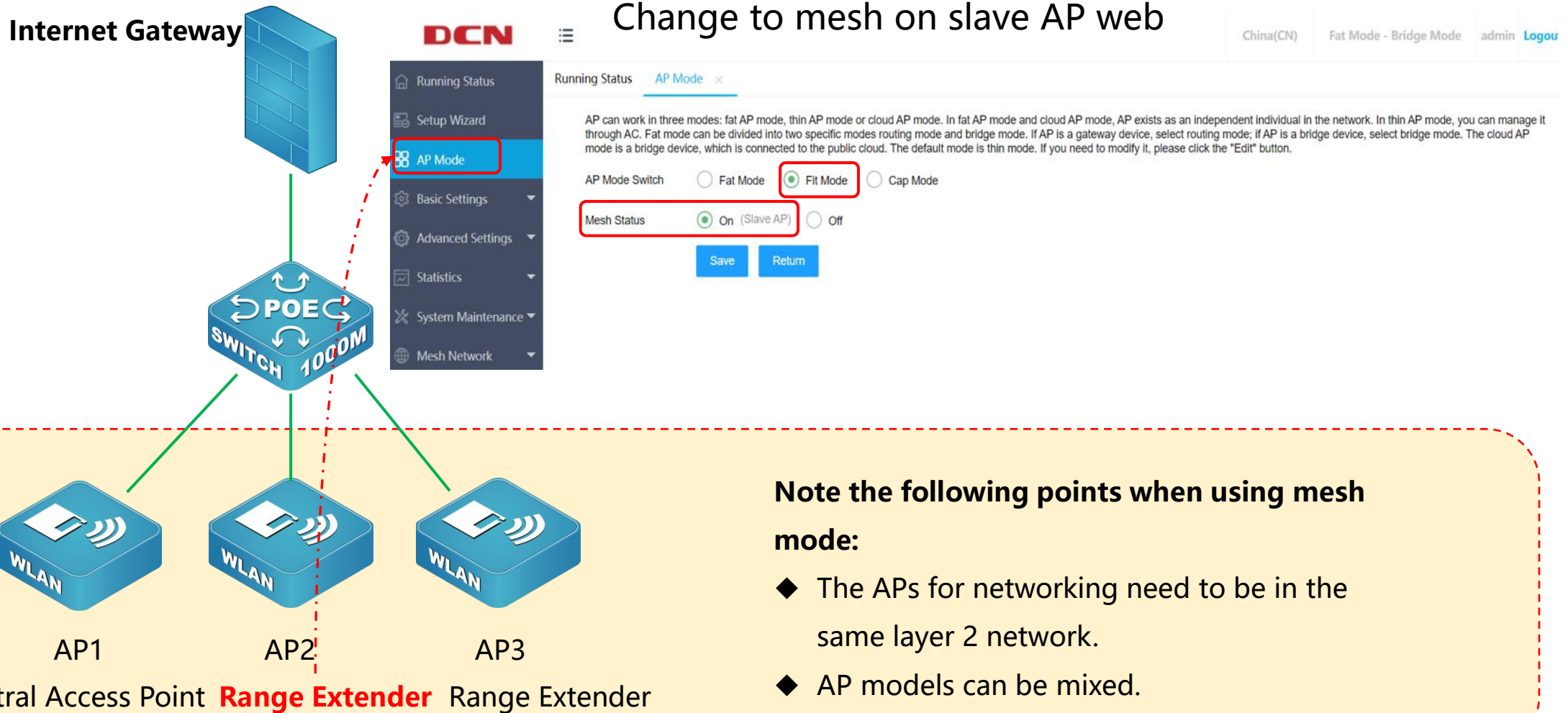


Note the following points when using Mesh mode:

- ◆ The AP software version starts with 4.14.x.x.
- ◆ It is recommended to set only one Central Access Controller AP in one layer 2 network.

Central Access Point Range Extender Range Extender

AP wired mesh networking



AP wired mesh networking

Check status on master AP web

Running Status

Setup Wizard

AP Mode

Basic Settings

Ethernet Settings

Wireless Settings

Advanced Settings

Statistics

System Maintenance

Mesh Network

Device Information

Serial Number: WL88200XW1Sunkz11

Device Model: WL8200-X4

Startup Mode: Warm Start

Firmware Version: 4.14.3.5

Boot Version: 2.3.3

Running Time: 3 days 3 hours 21 minutes 14 seconds

Network Information

IP Address: 172.30.78.13

MAC Address: 00:03:7F:12:DD:A0

Default Gateway: 172.30.78.1

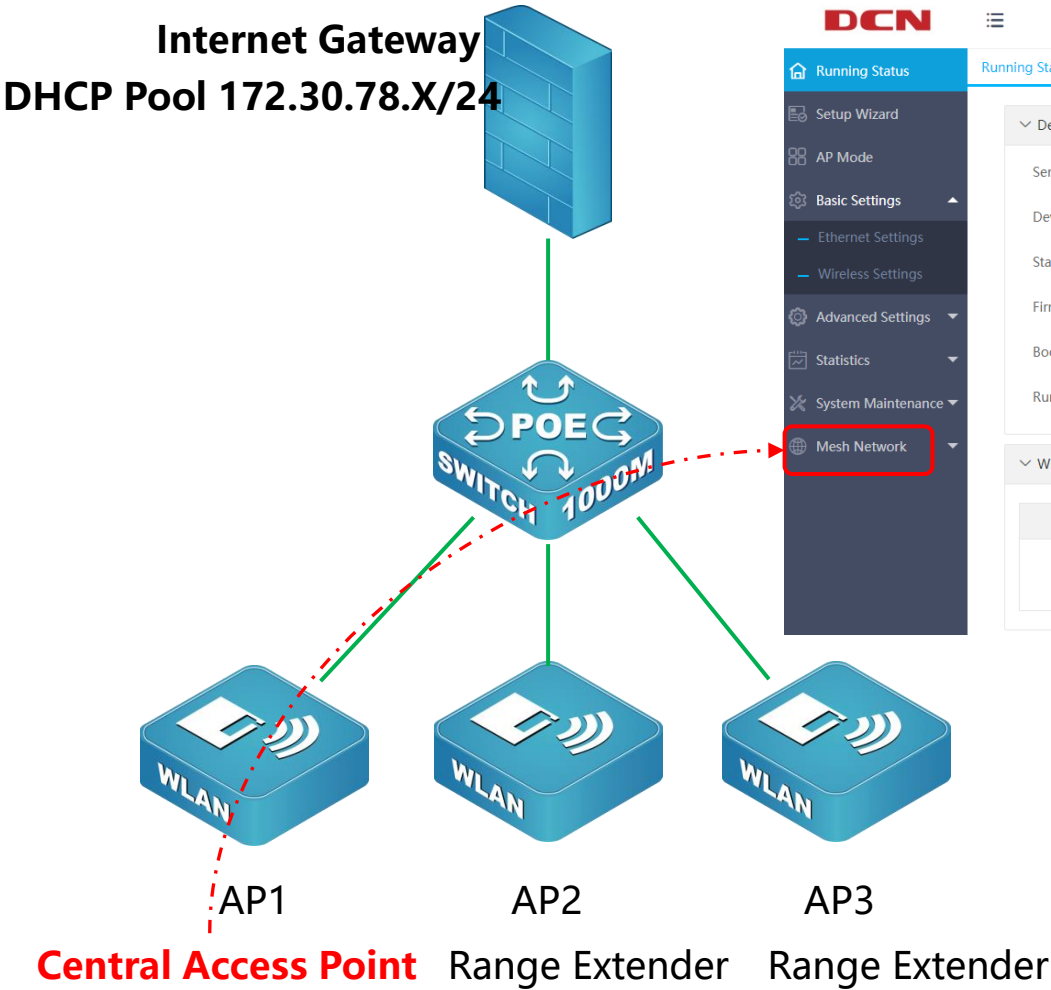
DNS Server: 202.103.44.150

Downlink VLAN: 1

Manage Status: --

Wireless Information

SSID	VLAN	Radio	Status	Mode	Channel Bandwidth	Channel	Transmit Power(dBm)	Channel Utilization(%)	Client Number
Guest Network	1	2.4G	Enabled	11axg	HT20	11	21	14	0
		5G	Enabled	11axa	HT40	44	24	2	0

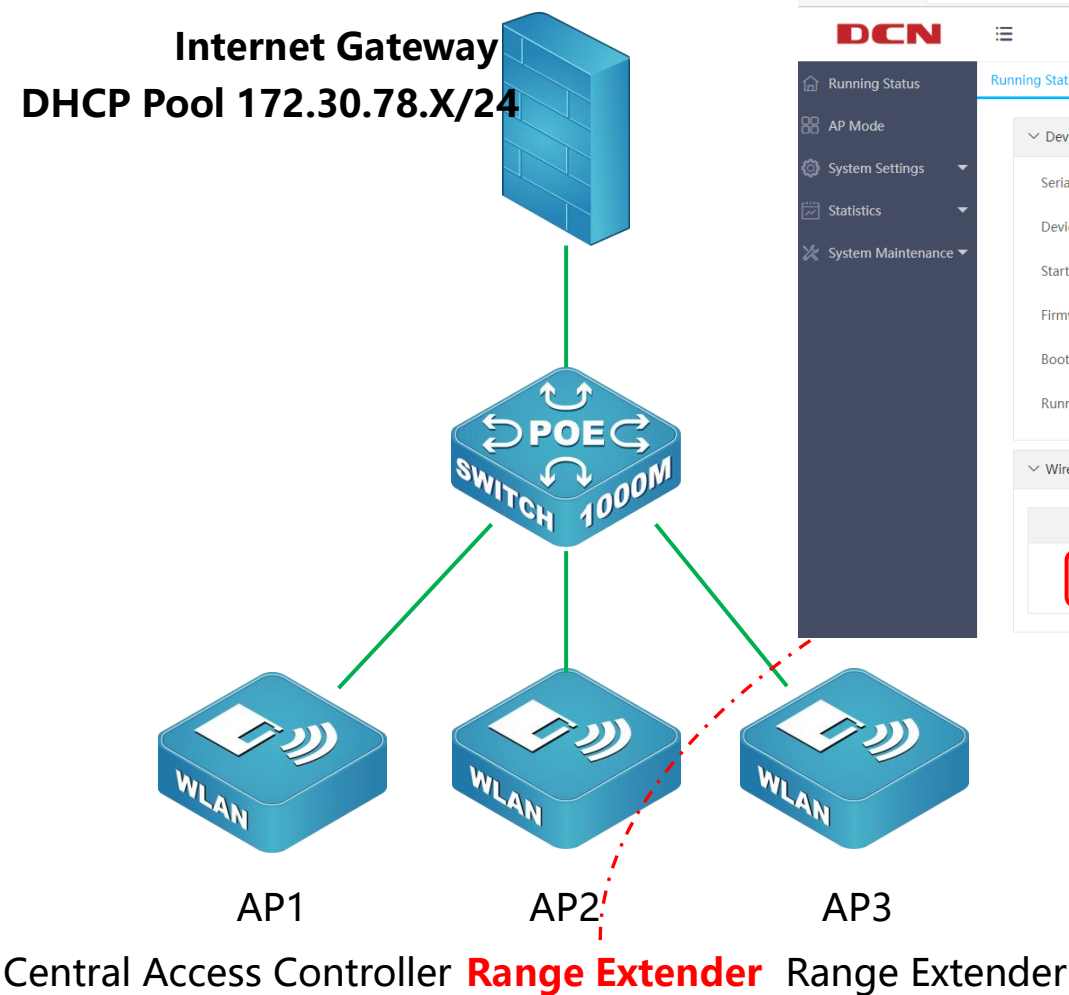


Get IP address form DHCP Pool

Default SSID
It can only be modified and cannot be deleted.

AP wired mesh networking

Check status on slave AP web



DCN

Running Status

Running Status

Device Information

Serial Number: WL8200XW2ConsoleCANTUSE

Device Model: WL8200-XW2

Startup Mode: Cold Start

Firmware Version: 4.14.3.5

Boot Version: 2.3.3

Running Time: 3 days 3 hours 22 minutes 21 seconds

Network Information

IP Address: 172.30.78.14

MAC Address: 00:03:0F:74:FF:00

Default Gateway: 172.30.78.1

DNS Server: 202.103.44.150

Downlink VLAN: 1

Manage Status: Have Been Managed 172.30.78.13

Wireless Information

SSID	VLAN	Radio	Status	Mode	Channel Bandwidth	Channel	Transmit Power(dBm)	Channel Utilization(%)	Client Number
Guest Network	1	2.4G	Enabled	11axg	HT20	11	20	25	0
		5G	Enabled	11axa	HT40	44	20	7	0

Get IP address form DHCP Pool

Default SSID
It can only be modified and cannot be deleted.

AP wired mesh networking

Check all AP info on master AP web

DCN

Running Status

Setup Wizard

AP Mode

Basic Settings

Advanced Settings

Statistics

System Maintenance

Mesh Network

Mesh Settings

AP List

Client Statistics

Network Settings

AP Upgrade

Blacklist

China(CN)

Fat Mode - Bridge Mode

admin

Logout

Running Status

AP List

Refresh

SN	MAC Address	IP Address	Type	Location	Channel	Transmit Power	Status	Running Time	Online Time	Operation
WL88200XW1Sunkz11 Master	00:03:7f:12:dd:a0	172.30.78.13	WL8200-X4		11/44	12/12	--	3 days 3 hours 53 minutes 9 seconds	--	statistical Client Manage
WL8200XW2ConsoleCANTUSE Slave	00:03:0f:74:ff:00	172.30.78.14	WL8200-XW2		11/44	12/12	Online	3 days 3 hours 52 minutes 40 seconds	3 days 1 hours 26 minutes 0 seconds	statistical Restart Client Delete Manage Restore Factory Join blacklist

Prev

1

Next

total 2 items

10item/page

AP wired mesh networking

Add new SSID on Master AP

DCN

Running Status

Setup Wizard

AP Mode

Basic Settings

Ethernet Settings

Wireless Settings

Advanced Settings

Statistics

System Maintenance

Mesh Network

Mesh Settings

AP List

Client Statistics

Network Settings

AP Upgrade

Blacklist

Running Status

Wireless Settings

Add

SSID	Vlan ID	Radio Enable
Guest Network	1	2.4G/5G

Country Code Settings

Country CodeChina

Unicast

Security Setting

Operation

ff

Open

Edit

Delete

Message

SSID*Please Input SSID

VLAN ID*Please Input VLAN ID

Radio*☒ 2.4G☒ 5G

Client Isolation*☐ On☒ Off

Hidden SSID*☐ On☒ Off

WDS Mode*☐ Enabled☒ Disabled

Multicast To Unicast*☐ On☒ Off

Security Setting*Open

Speed Limit Mode*☒ SSID Speed Limit☐ Client Speed Limit

Uplink Speed Limit(kBps)Please Input Uplink Speed Limit(Range:0-524286)(Optional)

Downlink Speed Limit(kBps)Please Input Downlink Speed Limit(Range:0-524286)(Optional)

Save

AP wired mesh networking

Check new SSID on Master AP

←↻🏠

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DCN

China(CN)Fat Mode - Bridge ModeadminLogout

🏠 Running Status

📋 Setup Wizard

🔧 AP Mode

⚙️ Basic Settings

— Ethernet Settings

— Wireless Settings

⚙️ Advanced Settings

📊 Statistics

🔧 System Maintenance

🌐 Mesh Network

— Mesh Settings

— AP List

— Client Statistics

— Network Settings

— AP Upgrade

— Blacklist

Running StatusWireless Settings

Add

SSID	Vlan ID	Radio Enable	Client Isolation	Hidden SSID	WDS Mode	Multicast To Unicast	Security Setting	Operation
Guest Network	1	2.4G/5G	Off	On	Disabled	Off	Open	EditDelete
DCN-test	1	2.4G/5G	Off	Off	Disabled	Off	Open	EditDelete

Country Code Settings

Country CodeChinaSave

AP wired mesh networking

Check new SSID on slave AP

← ↻ 🏠 ⚠️ 不安全 | <https://172.30.78.14/index.php/home/index/index.html?l=en-us> A 🌐 📶 ⚙️ ☆ 📄

DCN ☰ China(CN) Fit Mode

🏠 Running Status

🔧 AP Mode

⚙️ System Settings ▾

📊 Statistics ▾

🔧 System Maintenance ▾

Running Status

▽ Device Information

Serial Number: WL8200XW2ConsoleCANTUSE

Device Model: WL8200-XW2

Startup Mode: Cold Start

Firmware Version: 4.14.3.5

Boot Version: 2.3.3

Running Time: 3 days 4 hours 5 minutes 44 seconds

▽ Network Information

IP Address: 172.30.78.14

MAC Address: 00:03:0F:74:FF:00

Default Gateway: 172.30.78.1

DNS Server: 202.103.44.150

Downlink VLAN: 1

Manage Status: Have Been Managed 172.30.78.13

▽ Wireless Information

SSID	VLAN	Radio	Status	Mode	Channel Bandwidth	Channel	Transmit Power(dBm)	Channel Utilization(%)	Client Number
Guest Network	1	2.4G	🟢 Enabled	11axg	HT20	11	20	24	0
		5G	🟢 Enabled	11axa	HT40	44	20	5	0
DCN-test	1	2.4G	🟢 Enabled	11axg	HT20	11	20	24	0
		5G	🟢 Enabled	11axa	HT40	44	20	5	0

AP wired mesh networking

Set mesh networks managed by Imcloud platform on master AP web

The screenshot displays the DCN (DCN Global) web interface for configuring an AP. The top navigation bar includes the DCN logo, a menu icon, and user information: China(CN), Fat Mode - Bridge Mode, admin, and a Logout link. The left sidebar contains a list of navigation items: Running Status, Setup Wizard, AP Mode, Basic Settings, Advanced Settings, Statistics, System Maintenance, and Mesh Network. The Mesh Network section is expanded, showing sub-items: Mesh Settings (highlighted with a red box), AP List, Client Statistics, Network Settings, AP Upgrade, and Blacklist. The main content area shows the 'Mesh Settings' page with tabs for Air-Match, Automatic channel adjustment, Automatic power adjustment, and Connect to the public cloud (highlighted with a red box). Under the 'Connect to the public cloud' tab, there is a 'Status*' field with two radio buttons: 'On' and 'Off' (selected, highlighted with a red box). Below the radio buttons are 'Save' and 'Cancel' buttons.

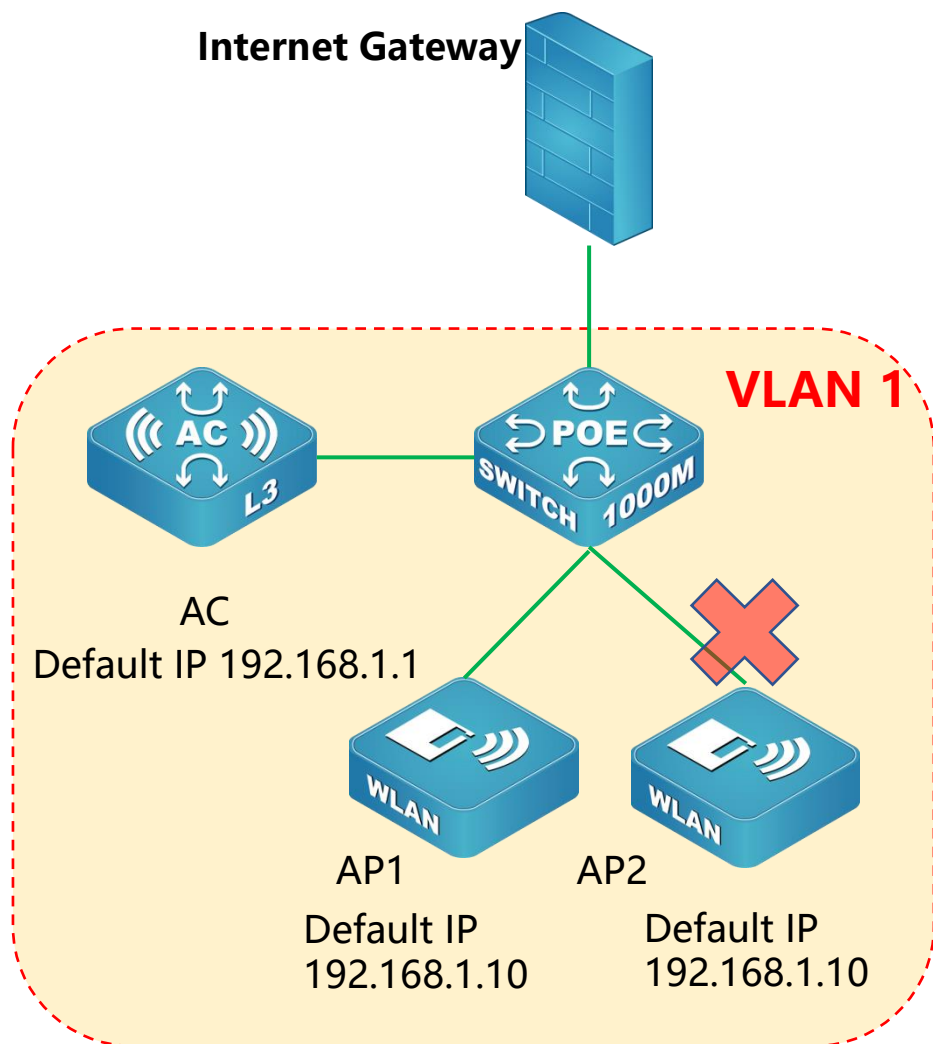
AP wired mesh networking

Mesh supported AP models

Model	FW version	CAP	RE	RE Qty
WL8200-X10	4.14.3.x	Yes	Yes	32
WL8200-X4		Yes	Yes	32
WL8200-X2		Yes	Yes	16
WL8200-XW2		Yes	Yes	16
WL8200-XT2/XIT2		Yes	Yes	16
WL8200-X1	5.15.3.x	Yes	Yes	8
WL8200-XW1		NA	Yes	NA

- **FAT AP networking**
- **AP wired mesh networking**
- **FIT AP + AC simple layer-2 networking**
- **FIT AP + AC recommended layer-3 networking**
- **Cloud AP networking**

FIT AP + AC simple layer-2 networking – Network topology

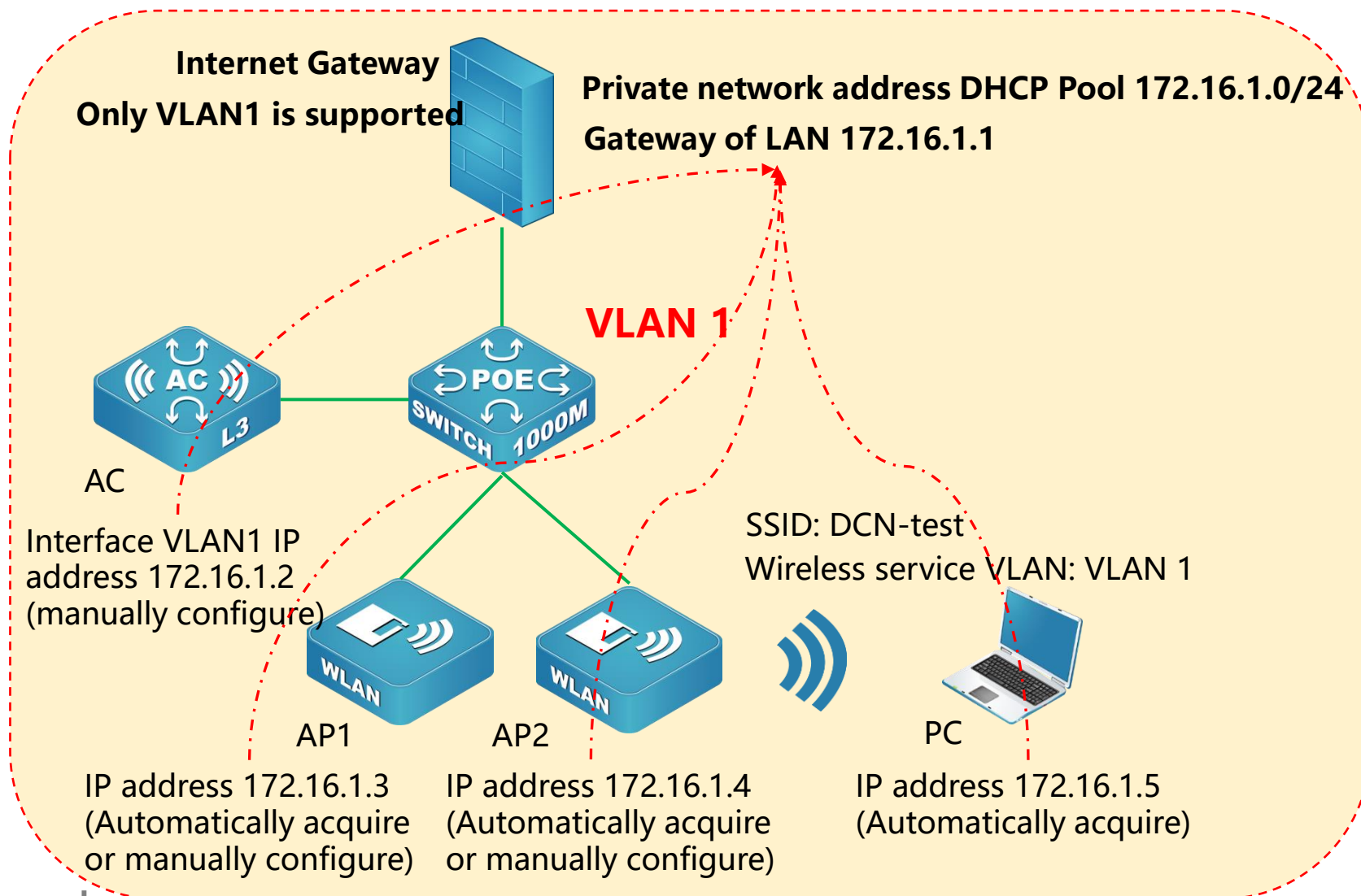


Such networking is not particularly applicable in real production networks.

Reason:

- ◆ The wireless management IP address of AC will be changed according to the network planning.
- ◆ There will be many APs, not only one. We need to manually set the IP address used by each AP (by default, all AP will use 192.168.1.10), so as to ensure that each AP can communicate with AC normally.
- ◆ In order to simplify the IP address allocation for APs, we can choose to use DHCP service.

FIT AP + AC simple layer-2 networking – Network topology



- ◆ If the Internet gateway is just a simple device that can only support VLAN1, this is the most convenient way to network.
- ◆ The IP address of the AP can be automatically obtained or manually configured. Just avoid address conflicts.
- ◆ The advantage of this networking is that AC and AP can access the Internet and the networking is simple without any configuration of the switch.
- ◆ The disadvantage is that all devices are in VLAN1. If wireless customers manually configure IP addresses, IP address conflicts may occur and affect the stable operation of the network.

FIT AP + AC simple layer-2 networking – Network topology

Configure VLAN on AC

DCN

Monitor Basic Network Wireless Authentication User System Upgrade admin

Port Settings

VLAN Management

DHCP Server(IPv4)

DHCP Server(IPv6)

Route Management

DNS Configuration

System Overview VLAN Management x

Page Operation

+ ↺

Vlan ID	Associated Port	IP Address	Subnet Mask	IPv6 Address	Prefix Length	Operation
1	1/0/1 1/0/2 1/0/3 1/0/4 1/0/5 1/0/6 1/0/7 1/0/8 1/0/9 1/0/10 1/0/11 1/0/12 1/0/13 1/0/14 1/0/15 1/0/16 1/0/17 1/0/18 1/0/19 1/0/20 1/0/21 1/0/22 1/0/23 1/0/24 1/0/25 1/0/26 1/0/27 1/0/28	192.168.1.1	255.255.255.0			 

< 1 > go to 1 page confirm Totle 1 Items 10 Items/Page

Port Name	Config State	Mode	Pvid	Operation
Ethernet1/0/1	Enable	Access	1	
Ethernet1/0/2	Enable	Access	1	
Ethernet1/0/3	Enable	Access	1	
Ethernet1/0/4	Enable	Access	1	
Ethernet1/0/5	Enable	Access	1	

< 1 2 3 ... 6 > go to 1 page confirm Totle 29 Items 5 Items/Page

FIT AP + AC simple layer-2 networking – Network topology

Configure VLAN interface on AC

The screenshot displays the DCN (Data Center Network) web interface for configuring a VLAN interface on an AC (Access Controller). The main menu includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The left sidebar shows Port Settings, VLAN Management, DHCP Server(IPv4), DHCP Server(IPv6), Route Management, and DNS Configuration. The main content area is titled 'VLAN Management' and shows a table of VLANs. A modal dialog box titled 'Edit Vlan' is open, allowing configuration for Vlan ID 1. The dialog includes fields for Vlan ID, Address Type (IPv4 selected), IP Address (172.16.1.2), and Subnet Mask (255.255.255.0). A red box highlights the 'Save' button.

Vlan ID	Associated Port	IP Address	Subnet Mask	IPv6 Address	Prefix Length	Operation
1	1/0/1, 1/0/2, 1/0/3, 1/0/4, 1/0/5, 1/0/6, 1/0/7, 1/0/8, 1/0/9, 1/0/10, 1/0/11, 1/0/12, 1/0/13, 1/0/14, 1/0/15, 1/0/16, 1/0/17, 1/0/18, 1/0/19, 1/0/20, 1/0/21, 1/0/22, 1/0/23, 1/0/24, 1/0/25, 1/0/26, 1/0/27, 1/0/28	192.168.1.1	255.255.255.0			 

1

go to 1 page confirm Totle 1 Items 10 Items/Page

Port Name	Config State
Ethernet1/0/1	Enable
Ethernet1/0/2	Enable
Ethernet1/0/3	Enable
Ethernet1/0/4	Enable
Ethernet1/0/5	Enable

1 2 3 ... 6 go to 1 page confirm Totle 29 Items

1

If Vlan is a three-tier interface, please configure IP address and Subnetmask.

Address Type * ☒ IPv4 ☐ IPv6

IP Address 172.16.1.2

Subnet Mask 255.255.255.0

Save Cancel

FIT AP + AC simple layer-2 networking – Network topology

Configure and check wireless management IP address on AC

DCN

Monitor

Basic Network

Wireless

Authentication

User

System

Upgrade

admin

Setup Wizard

AP Management

SSID Management

Wireless Client

Wireless Managem...

System Overview

Setup Wizard

Wireless Management IP

Wireless Management IP

Please Select

Please Select

127.0.0.1(Loopback)

172.16.1.2(Vlan1)

DCN

Monitor

Basic Network

Wireless

Authentication

User

System

Upgrade

System Overview

AP List

SSID List

Wireless Client List

DHCP User List

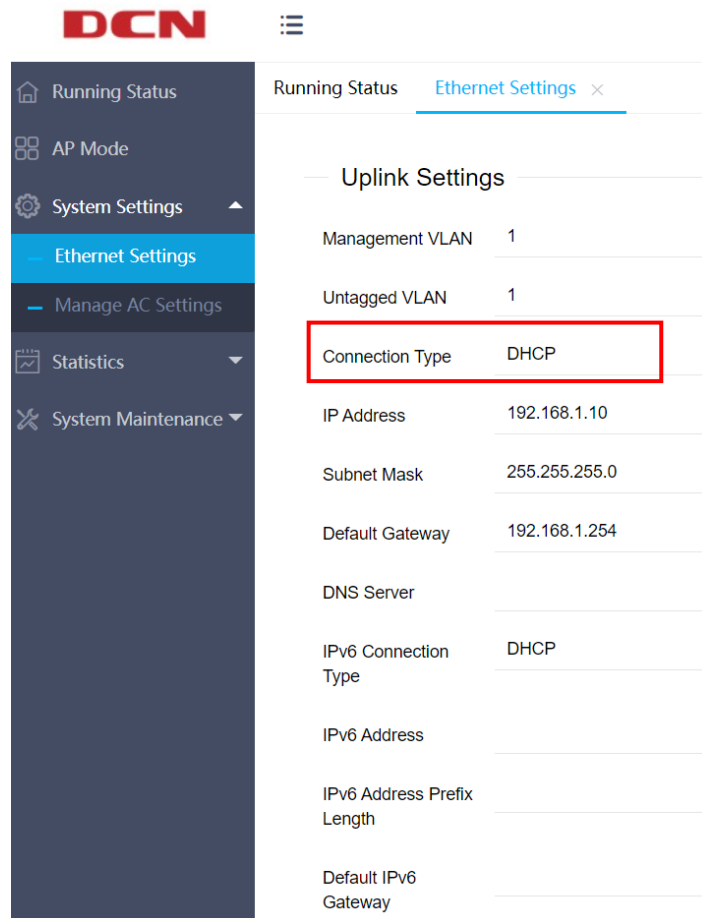
System Overview

Device Information

Device Model	DCWS-6028-C	Device Name	DCWS-6028-C
Wireless Managed Address	172.16.1.2	Software Version	7.5.4.3(R0002.0077)
MAC Address	00-03-0f-dc-39-85	S/N	WL023410K828000039
Max Managed AP Number	256	License Managed AP Number	16
Country Code	US	Uptime	2d:01:30

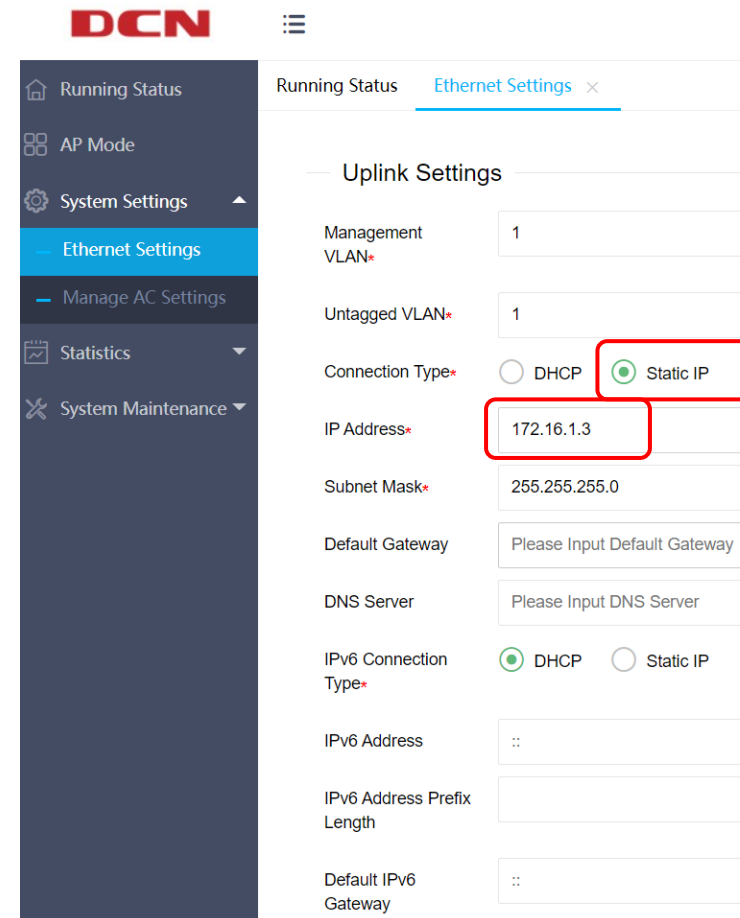
FIT AP + AC simple layer-2 networking – Network topology

Configure IP address on AP Web



The screenshot shows the DCN web interface for an AP. The left sidebar contains a menu with 'Ethernet Settings' highlighted. The main content area is titled 'Ethernet Settings' and shows 'Uplink Settings'. The 'Connection Type' is set to 'DHCP', which is highlighted with a red box. Other settings include Management VLAN (1), Untagged VLAN (1), IP Address (192.168.1.10), Subnet Mask (255.255.255.0), Default Gateway (192.168.1.254), DNS Server, IPv6 Connection Type (DHCP), IPv6 Address, IPv6 Address Prefix Length, and Default IPv6 Gateway.

Uplink Settings	
Management VLAN	1
Untagged VLAN	1
Connection Type	DHCP
IP Address	192.168.1.10
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.254
DNS Server	
IPv6 Connection Type	DHCP
IPv6 Address	
IPv6 Address Prefix Length	
Default IPv6 Gateway	



The screenshot shows the DCN web interface for an AP. The left sidebar contains a menu with 'Ethernet Settings' highlighted. The main content area is titled 'Ethernet Settings' and shows 'Uplink Settings'. The 'Connection Type' is set to 'Static IP', which is highlighted with a red box. The 'IP Address' is set to '172.16.1.3', which is also highlighted with a red box. Other settings include Management VLAN (1), Untagged VLAN (1), Subnet Mask (255.255.255.0), Default Gateway (Please Input Default Gateway), DNS Server (Please Input DNS Server), IPv6 Connection Type (DHCP), IPv6 Address (::), IPv6 Address Prefix Length, and Default IPv6 Gateway (::).

Uplink Settings	
Management VLAN*	1
Untagged VLAN*	1
Connection Type*	☐ DHCP ☒ Static IP
IP Address*	172.16.1.3
Subnet Mask*	255.255.255.0
Default Gateway	Please Input Default Gateway
DNS Server	Please Input DNS Server
IPv6 Connection Type*	☒ DHCP ☐ Static IP
IPv6 Address	::
IPv6 Address Prefix Length	
Default IPv6 Gateway	::

FIT AP + AC simple layer-2 networking – Network topology

Check managed AP on AC

DCN

System Overview

AP List

SSID List

Wireless Client List

DHCP User List

Route Information

ARP Information

AP RF Scanning

Client RF Scanning

Logs And Warnings

MonitorBasic NetworkWirelessAuthenticationUserSystemUpgrade

admin

System OverviewAP List x

Page Operation

> Conditional Search

Refresh

Print

AP Name	AP MAC	AP IP	AP Location	AP Model	AP Status	Uptime	Client Number
00-03-0f-11-22-00	00-03-0f-11-22-00	172.16.1.3		WL8200-X1	Managed	0d:00:01:04	0

<1>

>

go to

1

page

confirm

Total 1 Items

10 Items/Page

FIT AP + AC simple layer-2 networking – Network topology

Check SSID on AC

DCN Monitor Basic Network Wireless Authentication User System Upgrade admin

System Overview SSID List x Page Operation

SSID	Authentication Method	VLAN	Hidden SSID	Associated AP Number	Associated Client Number	2.4G Client Number	5G 1 Client Number	5G 2 Client Number	Down Tra
Guest Network	No Authentication	1	0	1	0	0	0	0	0

AP List
SSID List
Wireless Client List
DHCP User List
Route Information

DCN Monitor Basic Network Wireless Authentication User System Upgrade admin

System Overview SSID Management x Page Operation

SSID	Authentication Method	VLAN	Hidd...	Associated AP Number	Associated Client Number	2.4G Client Number	5G 1 Client Number	5G 2 Client Number	Down...	Operation
Guest Network	No Authentication	1	Off	0	0	0	0	0	0	

Setup Wizard
AP Management
SSID Management
Wireless Client
Wireless Managem...

FIT AP + AC simple layer-2 networking – Network topology

Configure SSID on AC

The screenshot displays the DCN AC Web UI for configuring an SSID. The interface includes a top navigation bar with tabs: Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The 'Wireless' tab is active. On the left, a sidebar menu shows 'SSID Management' selected. The main content area is titled 'SSID Management' and contains the following configuration sections:

- General Configuration:**
 - NetworkID: 1
 - SSID: Guest Network (highlighted with a red box)
 - Radio: ☒ 2.4G ☒ 5G 1 ☒ 5G 2
 - Hidden SSID: ☐ On ☒ Off
 - Terminal Isolation: ☐ On ☒ Off
 - Vlan: 1
- Advanced configuration:**
 - Uplink Bandwidth Per Client(Kbps): 0
 - Downlink Bandwidth Per Client(Kbps): 0
 - Time Limited Strategy: [Empty field] +
 - WDS Model: ☐ On ☒ Off
- Security Configuration:**
 - Authentication Method: No Authentication
- Select AP Group:**
 - Message: An AP group can bind up to 16 SSIDs. An out of limit AP group cannot be selected.
 - Options: ☐ To be selected, ☐ Selected AP Group, ☐ Default

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FIT AP + AC simple layer-2 networking – Network topology

Configure SSID on AC

DCN

Monitor Basic Network **Wireless** Authentication User System Upgrade admin

System Overview SSID Management x Page Operation

Setup Wizard AP Management **SSID Management** Wireless Client Wireless Management...

General Configuration

NetworkID 1

SSID * DCN-test

Radio * ☒ 2.4G ☒ 5G 1 ☒ 5G 2

Hidden SSID * ☐ On ☒ Off

Terminal Isolation * ☐ On ☒ Off

Vlan * 1

Advanced configuration

Uplink Bandwidth Per Client(Kbps) 0 Downlink Bandwidth Per Client(Kbps) 0

Time Limited Strategy + WDS Model * ☐ On ☒ Off

Security Configuration

Authentication Method * No Authentication

Select AP Group

An AP group can bind up to 16 SSIDs. An out of limit AP group cannot be selected.

☐ To be selected ☐ Selected AP Group ☐ Default

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← WLAN ?

WLAN ☒

Network acceleration Off >

More settings >

CONNECTED

Yunke_WLAN Connected

AVAILABLE

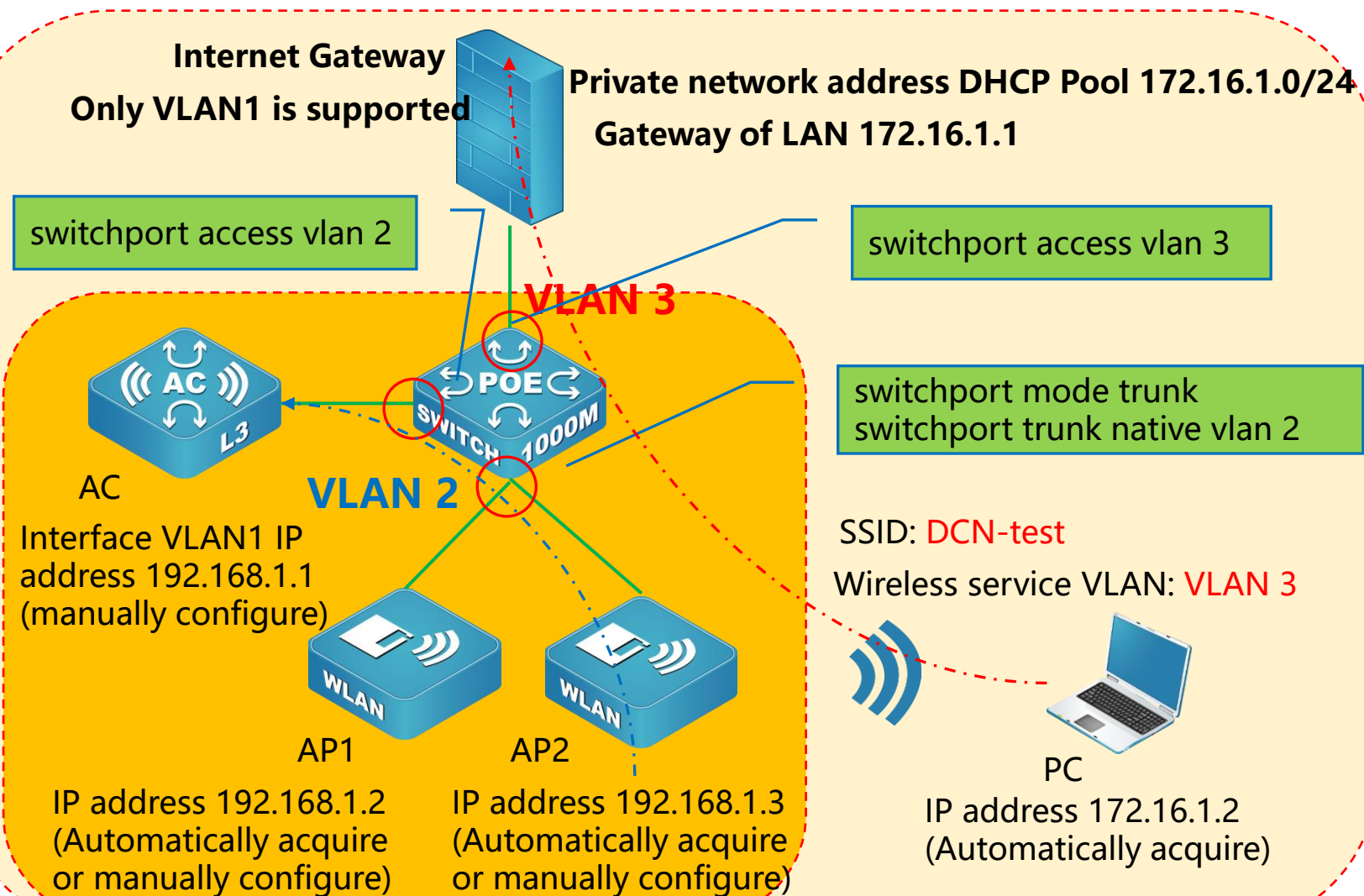
60 Open

DCN Open

DCN-test Open

Add network

FIT AP + AC simple layer-2 networking – Network topology



- ◆ If the AC and AP do not need to be accessed from Internet, they can be planned with special management VLAN2.
- ◆ Wireless service VLAN and device management VLAN are independent.
- ◆ DHCP service can be deployed on AC in VLAN2 to automatically assign IP addresses to APs.
- ◆ Need to config proper VLAN on switches.
- ◆ At this time, VLAN 1 will not be used as wireless service VLAN.

FIT AP + AC simple layer-2 networking – Config DHCP service

Create DHCP service pool on AC

1

2

3

The screenshot displays the DCN web management interface. The top navigation bar contains the following tabs: Monitor, Basic Network (selected), Wireless, Authentication, User, System, and Upgrade. The left sidebar lists the following options: Port Settings, VLAN Management, DHCP Server(IPv4) (highlighted), DHCP Server(IPv6), Route Management, and DNS Configuration. The main content area shows the 'DHCP Server(IPv4)' configuration page. It includes a 'System Overview' tab and a 'DHCP Server(IPv4)' tab. The 'Service Status' tab is active, showing the 'DHCP(IPv4) Service Status' as 'OFF'. The 'Address Pool' and 'Exclude Address' tabs are also visible.

FIT AP + AC simple layer-2 networking – Config DHCP service

Configure DHCP pool on AC

The screenshot shows the DCN web interface for configuring a DHCP pool. The sidebar on the left contains the following menu items: Port Settings, VLAN Management, DHCP Server(IPv4) (highlighted), DHCP Server(IPv6), Route Management, and DNS Configuration. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The main content area is titled 'DHCP Server(IPv4)' and contains the following configuration fields:

- DHCP Pool Name ***: ap-management
- Type ***: ☒ Dynamic Allocation ☐ Static Allocation
- Network ***: 192.168.1.0
- Netmask ***: 255.255.255.0
- Lease**: 1 days, 0 hours, 0 minutes
- Option43**: xxx.xxx.xxx.xxx;xxx.xxx.xxx.xxx
- Default Gateway**: 192.168.1.1
- DNS Server**: xxx.xxx.xxx.xxx +

At the bottom right, there are 'Save' and 'Cancel' buttons.

FIT AP + AC simple layer-2 networking – Config DHCP service

Configure DHCP pool on AC web

The screenshot shows the DCN web interface for configuring a DHCP pool. The sidebar on the left contains the following menu items: Port Settings, VLAN Management, DHCP Server(IPv4) (highlighted), DHCP Server(IPv6), Route Management, and DNS Configuration. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The main content area is titled 'DHCP Server(IPv4)' and contains the following configuration fields:

- DHCP Pool Name: ap-management
- Type: ☐ Dynamic Allocation, ☒ Static Allocation
- MAC Address: xx-xx-xx-xx-xx-xx
- IP Address: xxx.xxx.xxx.xxx
- Netmask: 255.255.255.0
- Lease: 1 days, 0 hours, 0 minutes
- Option43: xxx.xxx.xxx.xxx;xxx.xxx.xxx.xxx
- Default Gateway: 192.168.1.1
- DNS Server: xxx.xxx.xxx.xxx +

At the bottom right, there are 'Save' and 'Cancel' buttons.

FIT AP + AC simple layer-2 networking – Config DHCP service

Enable DHCP service on AC

The screenshot displays the DCN (Data Center Network) web interface. On the left is a dark sidebar with the DCN logo at the top and a list of menu items: Port Settings, VLAN Management, DHCP Server(IPv4) (highlighted in teal), DHCP Server(IPv6), Route Management, and DNS Configuration. The main content area has a top navigation bar with tabs: Monitor, Basic Network (selected), Wireless, Authentication, User, System, and Upgrade. Below this, there's a sub-navigation bar with 'System Overview' and 'DHCP Server(IPv4)' (with a close icon). The 'DHCP Server(IPv4)' section contains three tabs: 'Service Status' (highlighted with a red box), 'Address Pool', and 'Exclude Address'. Under the 'Service Status' tab, there is a 'DHCP(IPv4) Service Status' label followed by a green toggle switch labeled 'ON', which is also highlighted with a red box.

FIT AP + AC simple layer-2 networking – Config DHCP service

Configure excluded address of DHCP service on AC

The image displays two screenshots of the DCN (Data Center Network) web interface, illustrating the steps to configure a DHCP excluded address.

Top Screenshot: The interface shows the 'Basic Network' tab selected. Under 'DHCP Server(IPv4)', the 'Exclude Address' tab is active. A red box highlights the '+' button in the top left corner of the table, indicating where to click to add a new excluded address. The table has columns for 'Number', 'Exclude Start IP', 'Exclude End IP', and 'Operation'. The current state shows a 'null' entry.

Bottom Screenshot: This screenshot shows the 'Exclude Address' form. The 'Exclude Start IP' and 'Exclude End IP' fields are highlighted with a red box. The 'Exclude Start IP' field contains 'xxx.xxx.xxx.xxx' and the 'Exclude End IP' field contains 'xxx.xxx.xxx.xxx'. A red box also highlights the 'Save' button in the bottom right corner of the form.

FIT AP + AC simple layer-2 networking – Config DHCP service

Check AP and assigned IP address on AC web

The screenshot shows the DCN AC web interface. The 'Monitor' tab is selected in the top navigation bar. In the left sidebar, the 'DHCP User List' option is highlighted. The main content area displays the 'DHCP User List' page. The 'IPv4' tab is active, and a table lists the DHCP users. A red box highlights the first entry in the table.

MAC Address	IP Address	Expiration Time
00-03-0f-11-22-00	192.168.1.2	2022-09-24 17:03:00

The screenshot shows the DCN AC web interface. The 'Monitor' tab is selected in the top navigation bar. In the left sidebar, the 'AP List' option is highlighted. The main content area displays the 'AP List' page. The 'Conditional Search' section is empty. A table lists the APs. A red box highlights the first entry in the table.

AP Name	AP MAC	AP IP	AP Location	AP Model	AP Status	Uptime	Client Number
00-03-0f-11-22-00	00-03-0f-11-22-00	192.168.1.2		WL8200-X1	Managed	0d:00:02:30	0

FIT AP + AC simple layer-2 networking – Config wireless service

Configure service VLAN ID in SSID on AC web

The screenshot displays the DCN AC web interface for configuring a wireless service. The left sidebar contains navigation options: Setup Wizard, AP Management, SSID Management (highlighted), Wireless Client, and Wireless Management. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The main content area is titled 'SSID Management' and shows the configuration for a specific SSID.

General Configuration

- NetworkID: 1
- SSID: DCN-test (highlighted with a red box)
- Radio: 2.4G, 5G 1, 5G 2 (all checked)
- Hidden SSID: Off (radio button selected)
- Terminal Isolation: Off (radio button selected)
- Vlan: 3 (highlighted with a red box)

Advanced configuration

- Uplink Bandwidth Per Client(Kbps): 0
- Downlink Bandwidth Per Client(Kbps): 0
- Time Limited Strategy: +
- WDS Model: Off (radio button selected)

Security Configuration

- Authentication Method: No Authentication

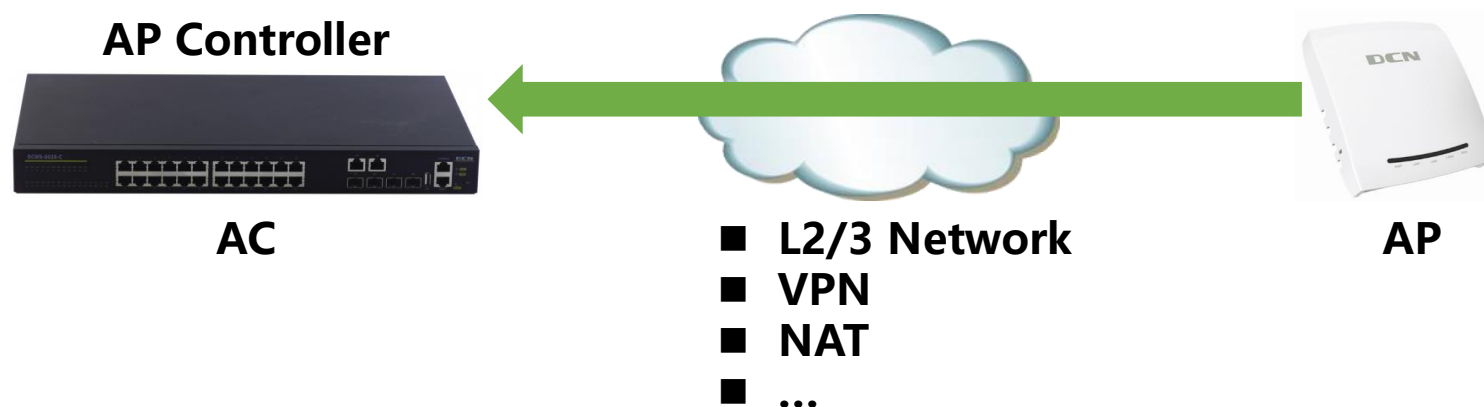
Select AP Group

An AP group can bind up to 16 SSIDs. An out of limit AP group cannot be selected.

- ☐ To be selected
- ☐ Selected AP Group
- ☐ Default

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FIT AP + AC simple layer-2 networking – AP discovers AC



- ◆ AC is listening port 57776 always and will respond if it receives the AP discovery message.
- ◆ ensure that the discovery message sent by AP to AC can reach AC normally.
- ◆ Manually configure the wireless management IP address of AC into FIT AP.
- ◆ AP will send discovery message using **UDP** type and destination **port 57776** to wireless management IP address of AC.
- ◆ After receiving the discovery response message of AC, AP will initiate a **TCP** connection to AC using destination **port 57777**.

FIT AP + AC simple layer-2 networking – AP discovers AC

Config AC management IP on AP web

← → ↺ 🏠 ⚠️ 不安全 | <https://10.10.10.11/index.php/Home/Index/index.html?l=en-us> ☆ ☆ 🗂️ 👤 ...

DCN ☰

China(CN) Fit Mode admin [Logout](#)

Running Status Ethernet Settings × Manage AC Settings ×

AC IP Address 1	192.168.1.254
AC IP Address 2	
AC IP Address 3	
AC IP Address 4	
AC IPv6 Address 1	
AC IPv6 Address 2	
AC IPv6 Address 3	
AC IPv6 Address 4	
AC URL Address	www.acaddr.com

[Edit](#)

FIT AP + AC simple layer-2 networking – DHCP option 43

Configure option43 in DHCP pool on AC web

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

Port Settings VLAN Management DHCP Server(IPv4) DHCP Server(IPv6) Route Management DNS Configuration

System Overview Port Settings x DHCP Server(IPv4) x

DHCP Pool Name * ap-management

Type * ☒ Dynamic Allocation ☐ Static Allocation

Network * 192.168.1.0

Netmask * 255.255.255.0

Lease 1 days 0 hours 0 minutes

Option43 192.168.1.1;100.100.100.1

Default Gateway 192.168.1.1

DNS Server xxx.xxx.xxx.xxx +

```
service dhcp
ip dhcp conflict ping-detection enable
ip dhcp pool ap-management
network-address 192.168.1.0 255.255.255.0
default-router 192.168.1.1
option 43 hex 0104C0A801010104646401
```

Note:
The DHCP option 43 is configured in decimal form on the Web page and in hexadecimal form on the CLI.

FIT AP + AC simple layer-2 networking – DHCP option 43

AC IP: 192.168.1.1

↓ ↓ ↓ ↓

0104 C0 A8 0101

Command:

option 43 hex 0104c0a80101

option 43 hex 0104c0a801010104xxxxxxxxxx

FIT AP + AC simple layer-2 networking – DHCP option 43

- Enable DHCP Server;
- Add DHCP pool;
- Add DHCP Option 43 into the DHCP pool.

```
Switch(config)#ip dhcp pool AP
```

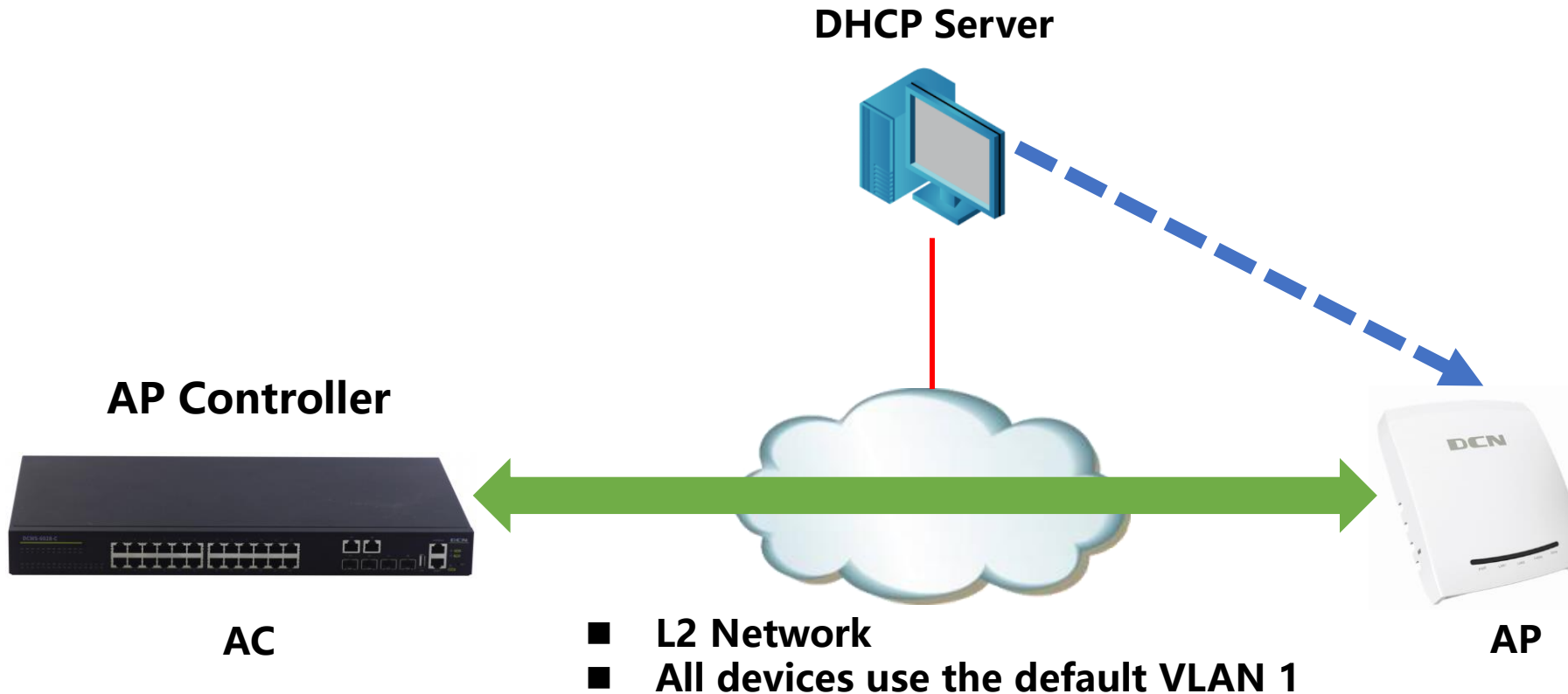
```
Switch(dhcp-AP-config)#network-address 192.168.100.1 24
```

```
Switch(dhcp-AP-config)#default-router 192.168.100.254
```

```
Switch(dhcp-AP-config)#option 43 hex 0104c0a80101
```

FIT AP + AC simple layer-2 networking

— Priority of discovery mechanism



Priority rules:

- ◆ *AP discover AC > AC discover AP*
- ◆ *Static configuration > DHCP option 43*

Tips:

- ◆ Because the priority of static configuration is the highest, this method can be used for troubleshooting to detect the network and port accessibility between AC and AP.

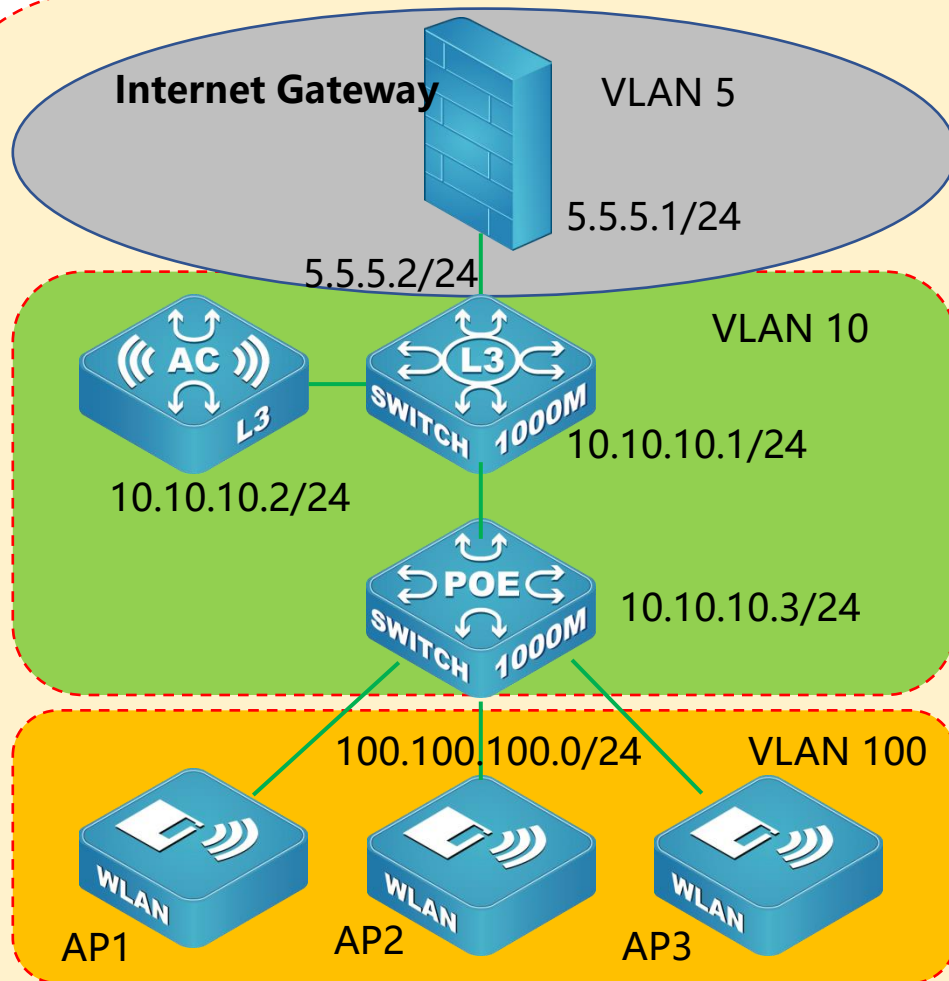
In a real environment, there may be multiple ways of discovery coexisting. In the network environment as shown in the figure above, there will be both the layer-2 broadcast message from AC and the UDP message from AP.

- **FAT AP networking**
- **AP wired mesh networking**
- **FIT AP + AC simple layer-2 networking**
- **FIT AP + AC recommended layer-3 networking**
- **Cloud AP networking**

FIT AP + AC recommended layer-3 networking

— Network topology

VLAN and IP planning



- ◆ L3 switch is the gateway of AC, POE switch, AP and wireless client.
- ◆ The management network segment of AC and POE switches is 10.10.10.X/24. Both are in VLAN10.
- ◆ The management network segment of the AP is 100.100.100.X/24. They are all in VLAN100.
- ◆ The network segment of the wireless client is 200.200.200.X/24. They are all in VLAN1000.
- ◆ Enable DHCP service on L3 switch to distribute IP addresses to APs and wireless clients.
- ◆ L3 switch uses 5.5.5.2 to interconnect with Internet gateway 5.5.5.1



SSID DCN-test & VLAN 1000

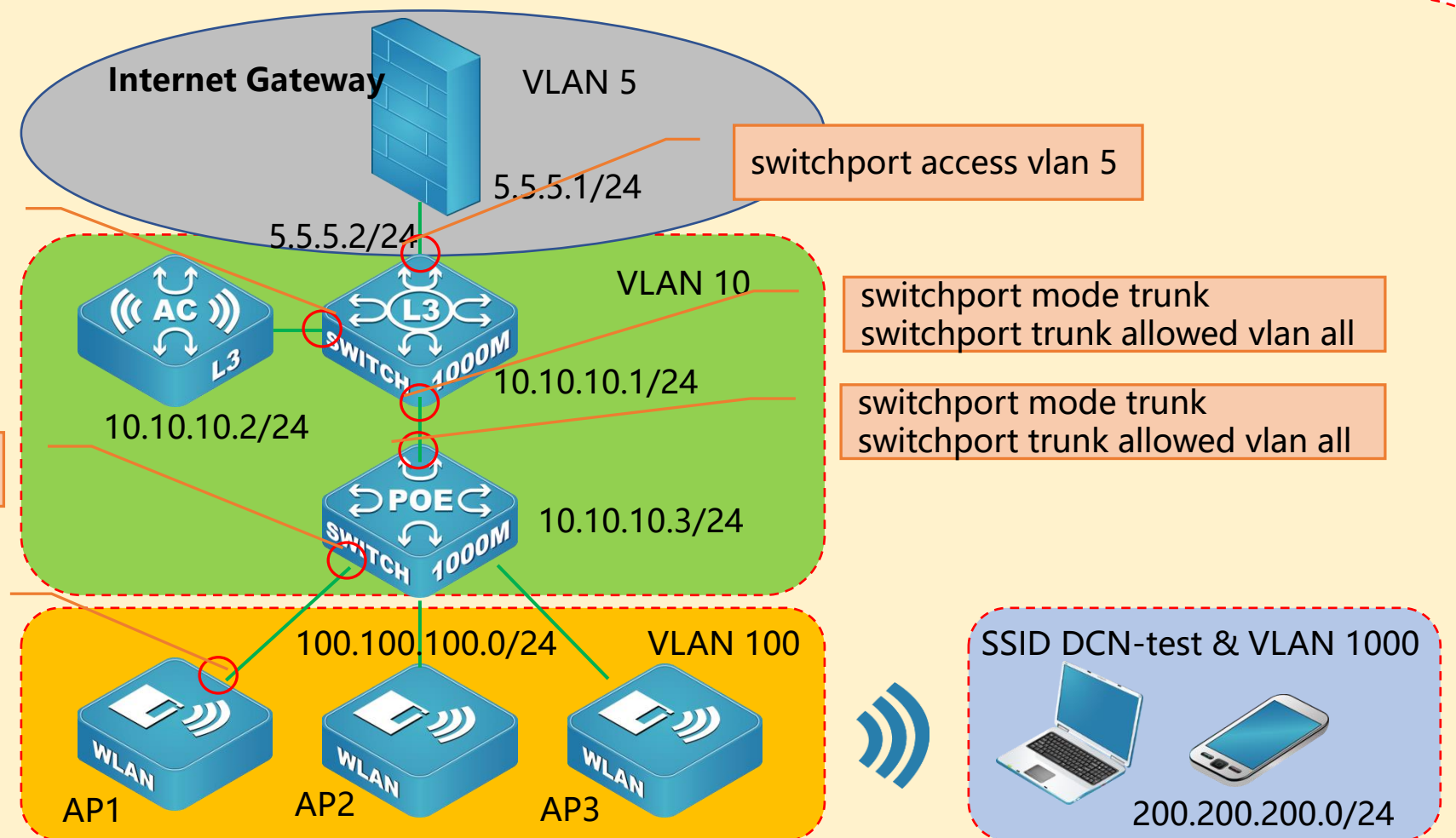


200.200.200.0/24

FIT AP + AC recommended layer-3 networking

— Network topology

VLAN and IP planning



FIT AP + AC recommended layer-3 networking topology

VLAN and IP configuration

```
interface vlan10
ip address 10.10.10.2
255.255.255.0
ip route 0.0.0.0/0 10.10.10.1
```

```
interface vlan10
ip address 10.10.10.3
255.255.255.0
ip route 0.0.0.0/0 10.10.10.1
```

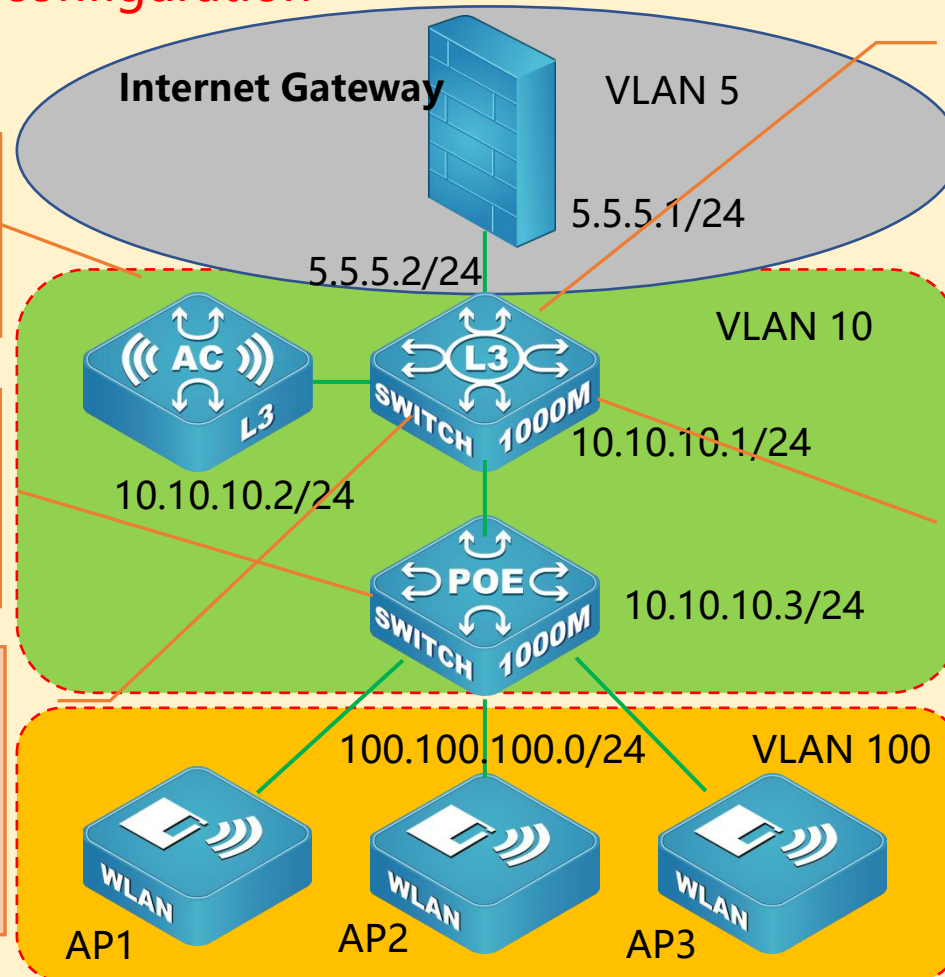
```
ip dhcp pool ap-management-vlan
network-address 100.100.100.0
255.255.255.0
default-router 100.100.100.1
option 43 hex 01040a0a0a02
```

```
interface vlan5
ip address 5.5.5.2 255.255.255.0
interface vlan10
ip address 10.10.10.1 255.255.255.0
interface vlan100
ip address 100.100.100.1
255.255.255.0
interface vlan1000
ip address 200.200.200.1
255.255.255.0
ip route 0.0.0.0/0 5.5.5.1
```

```
ip dhcp pool wireless-service-vlan
network-address 200.200.200.0
255.255.255.0
default-router 200.200.200.1
dns-server 8.8.8.8
```

SSID DCN-test & VLAN 1000

200.200.200.0/24



FIT AP + AC recommended layer-3 networking

Configure VLAN interface on AC

The screenshot displays the DCN web interface for configuring a VLAN interface. The main menu includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The left sidebar shows Port Settings, VLAN Management, DHCP Server(IPv4), DHCP Server(IPv6), Route Management, and DNS Configuration. The main content area is titled 'VLAN Management' and shows a table of VLANs. A modal window 'Edit Vlan' is open, showing the configuration for Vlan ID 1. The IP Address is 10.10.10.2 and the Subnet Mask is 255.255.255.0. The modal also includes a 'Save' button and a 'Cancel' button.

Vlan ID	Associated Port	IP Address	Subnet Mask	IPv6 Address	Prefix Length	Operation
1	1/0/1, 1/0/2, 1/0/3, 1/0/4, 1/0/5, 1/0/6, 1/0/7, 1/0/8, 1/0/9, 1/0/10, 1/0/11, 1/0/12, 1/0/13, 1/0/14, 1/0/15, 1/0/16, 1/0/17, 1/0/18, 1/0/19, 1/0/20, 1/0/21, 1/0/22, 1/0/23, 1/0/24, 1/0/25, 1/0/26, 1/0/27, 1/0/28	192.168.1.1	255.255.255.0			 

Edit Vlan

Vlan ID * 1

If Vlan is a three-tier interface, please configure IP address and Subnetmask.

Address Type * ☒ IPv4 ☐ IPv6

IP Address 10.10.10.2

Subnet Mask 255.255.255.0

Save **Cancel**

FIT AP + AC recommended layer-3 networking

Configure wireless management IP address on AC

The screenshot shows the DCN (Data Center Network) management interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The 'Wireless' tab is selected. On the left sidebar, 'Wireless Management...' is highlighted. The main content area shows a configuration form for 'Wireless Management IP'. A red box highlights the 'Wireless Management IP' label and the input field containing '10.10.10.2(Vlan1)'. Below the input field are 'Save' and 'Cancel' buttons. The interface also shows a 'Page Operation' dropdown in the top right corner.

Field	Value
Wireless Management IP	10.10.10.2(Vlan1)

FIT AP + AC recommended layer-3 networking

Configure default route on AC

1

DCN

Monitor Basic Network Wireless Authentication User System Upgrade admin

Port Settings VLAN Management DHCP Server(IPv4) DHCP Server(IPv6) Route Management DNS Configuration

System Overview Port Settings x Wireless Management IP x Route Management x Page Operation

IPv4 IPv6

+

Destination IP	Subnet Mask	Next Hop	Interface	Metric	Type	Operation
10.10.10.0	255.255.255.0	-	Vlan1	0	Directly	 
127.0.0.0	255.0.0.0	-	Loopback	0	Directly	 

< 1 > go to 1 page confirm Totle 2 Items 10 Items/Page

Static Route Settings

Destination IP * 0.0.0.0

Subnet Mask * 0.0.0.0

Next Hop * 10.10.10.1

Metric Please enter an integer between 1-255

4 Save Cancel

FIT AP + AC recommended layer-3 networking

Check routes on AC

DCN

Monitor Basic Network Wireless Authentication User System Upgrade admin

System Overview Port Settings **1** Wireless Management IP Route Management Page Operation

IPv4 IPv6

+ ↺

Destination IP	Subnet Mask	Next Hop	Interface	Metric	Type	Operation
0.0.0.0	0.0.0.0	10.10.10.1	Vlan1	1	Static	✎ 🗑
10.10.10.0	255.255.255.0	-	Vlan1	0	Directly	✎ 🗑
127.0.0.0	255.0.0.0	-	Loopback	0	Directly	✎ 🗑

< 1 > go to 1 page confirm Totle 3 Items 10 Items/Page

2 Route Management

FIT AP + AC recommended layer-3 networking

Check managed AP on AC web

The screenshot shows the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The left sidebar lists 'System Overview', 'AP List', 'SSID List', 'Wireless Client List', 'DHCP User List', and 'Route Information'. The 'Monitor' tab is active, and the 'AP List' sub-tab is selected. A table displays the list of managed APs. The first row is highlighted with a red box, showing details for an AP with ID 00-03-0f-11-22-00. The table has columns for AP Name, AP MAC, AP IP, AP Location, AP Model, AP Status, Uptime, and Client Number. The 'Client Number' for the highlighted AP is 0. A red circle with the number '1' is placed over the 'AP List' sub-tab, and a red circle with the number '2' is placed over the 'Conditional Search' button.

AP Name	AP MAC	AP IP	AP Location	AP Model	AP Status	Uptime	Client Number
00-03-0f-11-22-00	00-03-0f-11-22-00	100.100.100.2		WL8200-X1	Managed	0d:01:10:39	0

FIT AP + AC recommended layer-3 networking

Set country code on AC web

The screenshot displays the DCN (Defined Cloud Network) web interface for configuring an AC (Access Controller). The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System' (highlighted with a red box and a red circle labeled '1'), and 'Upgrade'. The left sidebar contains various management options, with 'Country Code' (highlighted with a red box and a red circle labeled '2') selected. The main content area shows the 'Country Code' configuration page, which includes a form with a 'Country Code *' field set to 'US--United States' and a 'Save' button.

FIT AP + AC recommended layer-3 networking

Fast configuration guide on AC web

The screenshot displays the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless' (highlighted with a red box and a circled '1'), 'Authentication', 'User', 'System', and 'Upgrade'. The left sidebar contains 'Setup Wizard' (highlighted with a red box and a circled '2'), 'AP Management', 'SSID Management', 'Wireless Client', and 'Wireless Managem...'. The main content area shows the 'General Configuration' step of the Setup Wizard. It includes fields for 'Port Name' (Ethernet1/0/1 (Up)), 'IP Address' (10.10.10.2), 'Subnet Mask' (255.255.255.0), 'IPv6 Address' (xx:xx), and 'Prefix Length' (1-128). A note states: 'Fill in at least one item of IP/IPv6 address, which represents the IP address and wireless management address of VLAN 1.' A 'Next Step' button is located at the bottom right.

DCN

Monitor Basic Network **Wireless** Authentication User System Upgrade

admin

System Overview Setup Wizard ×

Page Operation

General Configuration Wireless AP Group

General Configuration

Port Name Ethernet1/0/1 (Up)

IP Address 10.10.10.2

Fill in at least one item of IP/IPv6 address, which represents the IP address and wireless management address of VLAN 1.

Subnet Mask 255.255.255.0

IPv6 Address xx:xx

Prefix Length 1-128

Next Step

FIT AP + AC recommended layer-3 networking

Fast configuration guide on AC web

The screenshot displays the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The 'Wireless' tab is selected. On the left, a sidebar lists 'Setup Wizard', 'AP Management', 'SSID Management', 'Wireless Client', and 'Wireless Managem...'. The 'Setup Wizard' is active, showing a progress bar with 'General Configuration', 'Wireless', and 'AP Group' steps. The 'Wireless' step is currently selected. The configuration form includes the following fields:

- SSID ***: A text input field containing 'DCN-test'.
- Hidden SSID ***: Radio buttons for 'On' and 'Off', with 'Off' selected.
- Terminal Isolation ***: Radio buttons for 'On' and 'Off', with 'Off' selected.
- Vlan ***: A text input field containing '1000'.
- Authentication Method ***: A dropdown menu set to 'No Authentication'.

At the bottom right of the form, there are two buttons: 'Previous Step' and 'Next Step'.

FIT AP + AC recommended layer-3 networking

Fast configuration guide on AC web

The screenshot shows the DCN AC web configuration interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The 'Wireless' tab is selected. The left sidebar contains 'Setup Wizard', 'AP Management', 'SSID Management', 'Wireless Client', and 'Wireless Managem...'. The 'Setup Wizard' is active, showing a progress bar with 'General Configuration', 'Wireless', and 'AP Group' steps. The 'AP Group' step is currently selected. The configuration form for 'AP Group' includes the following fields and options:

- AP Group Name ***: A text input field containing 'DCN-test-ap-profile'.
- Air-Match ***: Radio buttons for 'On' (selected) and 'Off'.
- LED Status ***: Radio buttons for 'On' (selected) and 'Off'.
- Auto Channel Adjustment ***: Radio buttons for 'On' (selected) and 'Off'.
- AP Escape ***: Radio buttons for 'On' (selected) and 'Off'.
- Eco Mode ***: Radio buttons for 'On' and 'Off' (selected).
- Work Mode ***: Radio buttons for 'dual-4' (selected), 'single-8', and 'dual-8'.

At the bottom right of the configuration area, there are two buttons: 'Previous Step' and 'Save'.

FIT AP + AC recommended layer-3 networking

Check SSID on AC web

The screenshot displays the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The 'Wireless' menu is highlighted with a red box and labeled '1'. The left sidebar contains 'Setup Wizard', 'AP Management', 'SSID Management', 'Wireless Client', and 'Wireless Managem...'. The 'SSID Management' item is highlighted with a red box and labeled '2'. The main content area shows a table of SSIDs. The 'DCN-test' SSID is listed with various client counts. The 'Operation' column for this SSID contains an edit icon, which is highlighted with a red box and labeled '3'.

SSID	Authentication Method	VLAN	Hidd...	Associated AP Number	Associated Client Number	2.4G Client Number	5G 1 Client Number	5G 2 Client Number	Down...	Operation
DCN-test	No Authentication	1000	Off	1	0	0	0	0		

FIT AP + AC recommended layer-3 networking

Configure SSID on AC web, set service VLAN ID and AP group

The screenshot displays the DCN AC web interface for SSID Management. The left sidebar contains navigation options: Setup Wizard, AP Management, SSID Management (highlighted), Wireless Client, and Wireless Management. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The main content area is titled 'SSID Management' and shows the configuration for NetworkID 1. Key fields are highlighted with red boxes: SSID (DCN-test), Vlan (1000), and the 'Selected AP Group' checkbox (DCN-test-ap-profile). The configuration is divided into sections: General Configuration, Advanced configuration, Security Configuration, and Select AP Group. The 'General Configuration' section includes fields for NetworkID, SSID, Radio (2.4G, 5G 1, 5G 2), Hidden SSID, and Terminal Isolation. The 'Advanced configuration' section includes Uplink/Downlink Bandwidth Per Client, Time Limited Strategy, and WDS Model. The 'Security Configuration' section includes Authentication Method. The 'Select AP Group' section includes a warning message and checkboxes for 'To be selected' and 'Selected AP Group'.

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

System Overview Setup Wizard AP Management SSID Management

Page Operation

General Configuration

NetworkID 1

SSID * DCN-test

Radio * 2.4G 5G 1 5G 2

Hidden SSID * On Off

Terminal Isolation * On Off

Vlan * 1000

Advanced configuration

Uplink Bandwidth Per Client(Kbps) 0

Downlink Bandwidth Per Client(Kbps) 0

Time Limited Strategy +

WDS Model * On Off

Security Configuration

Authentication Method * No Authentication

Select AP Group

An AP group can bind up to 16 SSIDs. An out of limit AP group cannot be selected.

To be selected

Selected AP Group

DCN-test-ap-profile

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FIT AP + AC recommended layer-3 networking

Configure SSID on AC web, change authentication method

The screenshot displays the DCN AC web interface for SSID Management. The left sidebar contains navigation options: Setup Wizard, AP Management, SSID Management (highlighted), Wireless Client, and Wireless Management. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The main content area is titled 'SSID Management' and shows configuration for NetworkID 1. The SSID is 'DCN-test'. The 'General Configuration' section includes fields for NetworkID, SSID, Hidden SSID (set to Off), and Vlan (1000). The 'Advanced configuration' section includes Uplink and Downlink Bandwidth Per Client (both 0), Time Limited Strategy, and WDS Model (set to Off). The 'Security Configuration' section shows the Authentication Method dropdown menu open, with options: No Authentication (highlighted), WPA/WPA2-Personal, WPA/WPA2-Enterprise, Portal Authentication, WPA2/WPA3-Personal, and WPA2/WPA3-Enterprise. A red box highlights the dropdown menu. Below the dropdown, there is a message 'AP group cannot be selected.' and checkboxes for 'Selected AP Group' and 'DCN-test-ap-profile'. The footer indicates Copyright (C) 2001-2022 by DC YunKe Networks Co., Ltd.

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

System Overview Setup Wizard x SSID Management x

Page Operation

Setup Wizard

AP Management

SSID Management

Wireless Client

Wireless Management

General Configuration

NetworkID 1

SSID * DCN-test

Radio * 2.4G 5G 1 5G 2

Hidden SSID * On Off

Terminal Isolation * On Off

Vlan * 1000

Advanced configuration

Uplink Bandwidth Per Client(Kbps) 0

Downlink Bandwidth Per Client(Kbps) 0

Time Limited Strategy +

WDS Model * On Off

Security Configuration

Authentication Method * No Authentication

Select AP Group

AP group cannot be selected.

Selected AP Group

DCN-test-ap-profile

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FIT AP + AC recommended layer-3 networking

Configure SSID on AC web, change authentication method

The screenshot displays the DCN AC web interface for SSID Management. The left sidebar contains navigation options: Setup Wizard, AP Management, SSID Management (highlighted), Wireless Client, and Wireless Managem... The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The main content area is titled 'SSID Management' and contains three sections: General Configuration, Advanced configuration, and Security Configuration. In the General Configuration section, NetworkID is 1, SSID is DCN-test, Hidden SSID is Off, and Vlan is 1000. The Advanced configuration section shows Uplink and Downlink Bandwidth Per Client set to 0, and WDS Model is Off. The Security Configuration section shows the Authentication Method set to WPA2/WPA3-Personal and the Password set to 12345678. The Select AP Group section at the bottom indicates that an AP group can bind up to 16 SSIDs and lists 'To be selected' and 'Selected AP Group' options.

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

System Overview Setup Wizard × SSID Management ×

Page Operation

General Configuration

NetworkID 1

SSID * DCN-test

Radio * 2.4G 5G 1 5G 2

Hidden SSID * On Off

Terminal Isolation * On Off

Vlan * 1000

Advanced configuration

Uplink Bandwidth Per Client(Kbps) 0

Downlink Bandwidth Per Client(Kbps) 0

Time Limited Strategy +

WDS Model * On Off

Security Configuration

Authentication Method * WPA2/WPA3-Personal

Password 12345678

Select AP Group

An AP group can bind up to 16 SSIDs. An out of limit AP group cannot be selected.

To be selected

Selected AP Group

DCN-test-ap-profile

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FIT AP + AC recommended layer-3 networking

Check AP group configuration on AC web

DCN

Monitor Basic Network **Wireless** Authentication User System Upgrade

admin

Setup Wizard **2**

System Overview Setup Wizard **1** SSID Management x AP Management x

Page Operation

AP Management

SSID Management

Wireless Client

Wireless Managem...

AP Group List AP List

+ ↺

AP Group ID	AP Group Name	Management VLAN	Untag Vlan	Air-Match	LED Status	Auto Channel Adjustment	Eco Mode	Work Mode	Operation
1	DCN-test-ap-profile	1	1	On	On	On	Off	dual-4	3

< 1 > go to 1 page confirm Totle 1 Items 10 Items/Page

FIT AP + AC recommended layer-3 networking

AP group basic configuration on AC web

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

Setup Wizard

System Overview Setup Wizard × SSID Management × Wireless Management IP × AP Management ×

Page Operation

AP Management 1

Basic Information AP Remote Configuration

Basic Information

AP Group Name * DCN-test-ap-profile

Management VLAN * 1 Suggestion: keep the management vlan and the untag vlan same

Untag Vlan * 1

Air-Match * ☒ On ☐ Off

LED Status * ☒ On ☐ Off

Auto Channel Adjustment * ☒ On ☐ Off

AP Escape * ☒ On ☐ Off

Eco Mode * ☐ On ☒ Off

Work Mode * ☒ dual-4 ☐ single-8 ☐ dual-8

Terminal isolation * ☐ On ☒ Off

Vlan Information

Lan Port1Vlan * 1

Lan Port2Vlan * 1

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FIT AP + AC recommended layer-3 networking

AP group basic configuration on AC web

The screenshot displays the DCN AC web interface for AP group basic configuration. The interface includes a top navigation bar with tabs: Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The left sidebar shows the Setup Wizard and AP Management sections. The main content area is divided into several sections:

- Vlan Information:** This section contains four input fields for Lan Port1Vlan, Lan Port2Vlan, Lan Port3Vlan, and Lan Port4Vlan, all of which are set to the value 1. These fields are highlighted with a red box.
- Radio Information 2.4G:** This section contains three fields: Status (set to On), Bandwidth (set to HT20), and Tx-Power (set to 100%). The Bandwidth field is highlighted with a red box.
- Radio Information 5G_1:** This section contains three fields: Status (set to On), Bandwidth (set to HT40), and Tx-Power (set to 100%). The Bandwidth field is highlighted with a red box.
- Radio Information 5G_2:** This section is partially visible at the bottom of the interface.

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FIT AP + AC recommended layer-3 networking

Set AP remote access method on AC web

DCN

Monitor Basic Network Wireless Authentication User System Upgrade admin

System Overview Setup Wizard × SSID Management × Wireless Management IP × AP Management × Page Operation ▼

Basic Information AP Remote Configuration 1

AP Remote Configuration

Telnet Server * ☒ On ☐ Off

SSH Server * ☒ On ☐ Off

WEB Server * ☒ On ☐ Off

User Name * admin

Password *

Save Cancel

FIT AP + AC recommended layer-3 networking

Check specific AP in AP list on AC web

DCN

Monitor Basic Network **Wireless** Authentication User System Upgrade

admin

Setup Wizard

System Overview Setup Wizard × SSID Management × **AP Management** ×

AP Management **2** AP Group List **AP List** **3**

SSID Management

Wireless Client

Wireless Managem...

> Conditional Search

+ [Copy] [Delete] Clear [Upload] [Download] [Print] [Refresh] [Refresh]

	AP Name	AP MAC	AP IP	AP Location	AP Model	AP Status	Uptime	Client Number	Operation
☐	00-03-0f-11-22-00	00-03-0f-11-22-00	100.100.100.2		WL8200-X1	Managed	0d:21:54:47	0	4 [Edit] [Delete] [Refresh]

< **1** > go to 1 page confirm Totle 1 Items 10 Items/Page

FIT AP + AC recommended layer-3 networking

Configure specific AP on AC web

The screenshot shows the DCN AC web interface for configuring a specific AP. The interface is divided into a left sidebar and a main content area. The sidebar contains the following menu items: Setup Wizard, AP Management (highlighted in green), SSID Management, Wireless Client, and Wireless Managem... The main content area has a top navigation bar with the following tabs: Monitor, Basic Network, Wireless (selected), Authentication, User, System, and Upgrade. Below the navigation bar, there are tabs for System Overview, Setup Wizard, SSID Management, and AP Management (selected). The AP Management tab is active, showing the configuration form for a specific AP. The form is divided into three sections: Basic Information, Radio Information: 2.4G, and Radio Information: 5G. The Basic Information section contains the following fields: AP Name (00-03-0f-11-22-00), AP Group (DCN-test-ap-profile, highlighted with a red box), AP Location, and AP MAC (00-03-0f-11-22-00). The Radio Information: 2.4G section contains the following fields: Channel (Auto) and Tx-Power (Auto, both highlighted with a red box). The Radio Information: 5G section contains the following fields: Channel (Auto) and Tx-Power (Auto, both highlighted with a red box). At the bottom right of the form, there are two buttons: Save and Cancel.

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

Setup Wizard

System Overview Setup Wizard SSID Management AP Management

AP Management

SSID Management

Wireless Client

Wireless Managem...

Basic Information

AP Name * 00-03-0f-11-22-00

AP Group * DCN-test-ap-profile

AP Location

AP MAC * 00-03-0f-11-22-00

Radio Information: 2.4G

Channel Auto

Tx-Power Auto

Radio Information: 5G

Channel Auto

Tx-Power Auto

Save Cancel

FIT AP + AC recommended layer-3 networking

A group of APs batch operation on AC web

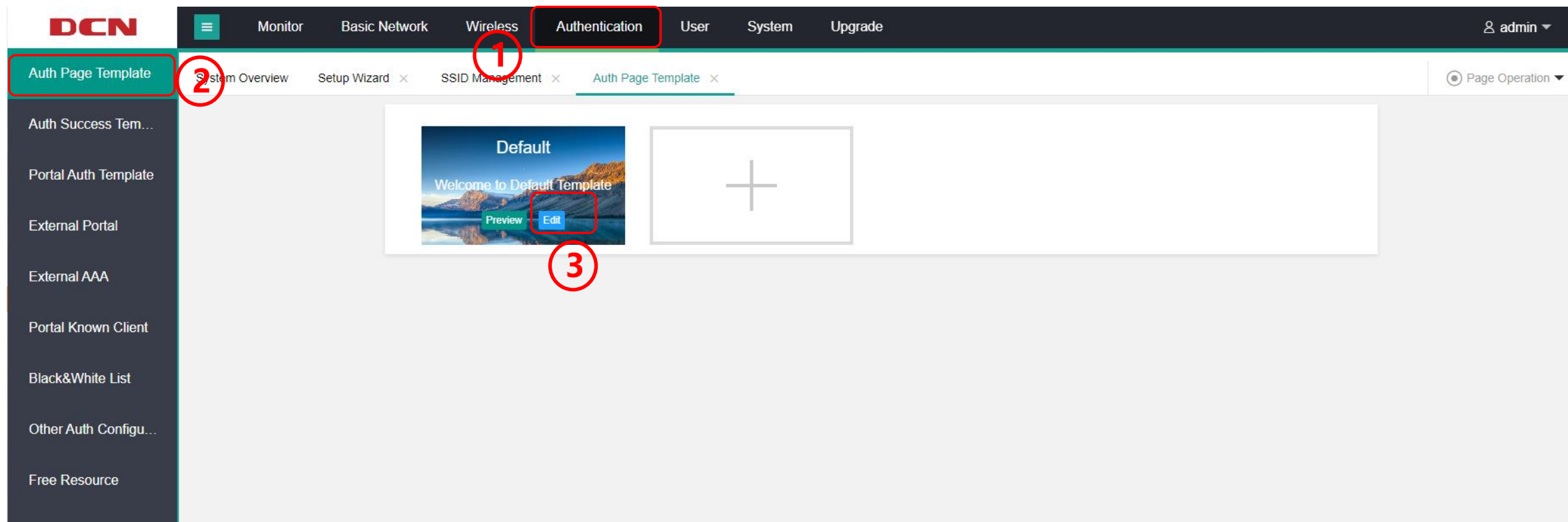
The screenshot shows the DCN AC web interface. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The left sidebar shows Setup Wizard, AP Management, SSID Management, Wireless Client, and Wireless Managem... The main content area is titled AP Management and shows a table of APs. A modal window titled 'Distribution Group' is open, showing a dropdown for 'AP Group' with the value 'DCN-test-ap-profile' selected. Red circles 1, 2, and 3 highlight the selection process.

AP Name	AP MAC	AP IP	AP Location	AP Model	AP Status	Uptime	Client Number	Operation
00-03-0f-11-22-00	00-03-0f-11-22-00	100.100.100.2		WL8200-X1	Managed	0d:21:59:24	0	

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FIT AP + AC recommended layer-3 networking

Configure built-in portal server on AC



FIT AP + AC recommended layer-3 networking

Edit portal authentication template of built-in server on AC web

The screenshot displays the DCN AC web interface for editing a portal authentication template. The interface includes a top navigation bar with tabs: Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The 'Authentication' tab is selected. A sidebar on the left lists various configuration options, with 'Auth Page Template' highlighted. The main content area shows the 'Auth Page Template' configuration for the 'Default' template. A red rounded rectangle highlights the configuration fields, which include:

- Template Name: Default
- Welcome Greeting: Welcome to Default Template
- Agreement type: none (selected), text, External url
- PC Background Image: Select the file, default_pc.jpg
- Mobile Background Image: Select the file, default_mobile.jpg
- Auth-box Background Color: #dddddd
- Welcome Font Color: #333333
- Button Background Color: #009688

Below the configuration fields, there is a preview of the 'Welcome Greeting' page, showing a login form with a 'remember password' checkbox, an 'Agree to abide by the terms of the local operator' checkbox, and a 'Button'.

FIT AP + AC recommended layer-3 networking

Edit portal auth success template of built-in server on AC web

The screenshot displays the DCN AC web interface for editing the portal authentication success template. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication' (highlighted with a red circle 1), 'User', 'System', and 'Upgrade'. The left sidebar shows 'Auth Page Template' with 'Auth Success Tem...' (highlighted with a red circle 2) selected. The main content area shows the 'Auth Success Template' configuration. A 'Notice message *' field (highlighted with a red circle 3) contains the text 'Authentication successful, now you can access the Internet'. Below this is an 'Image' section with a 'Select the file' button and a file named 'auth_success.jpg'. A preview of the image shows a bird flying over mountains with the text 'Authentication successful, now you can access the Internet' overlaid. At the bottom are 'Save' and 'Cancel' buttons.

FIT AP + AC recommended layer-3 networking

Configure portal auth aging time and portal server type on AC web

The screenshot displays the DCN (Defined Cloud Network) web interface for configuring authentication settings. The interface includes a top navigation bar with tabs: Monitor, Basic Network, Wireless, Authentication (highlighted with a red box and a red circle containing the number 1), User, System, and Upgrade. A left sidebar contains various configuration options, with 'Other Auth Configuration...' highlighted by a red box and a red circle containing the number 2. The main content area shows two configuration sections:

- Portal Aging Time:** A section with a dropdown arrow and a text input field labeled 'Portal Aging Time (days)' containing the value '1'. A blue 'Save' button is located to the right.
- Portal Auth Type:** A section with a dropdown arrow and two radio button options: 'External' (selected, indicated by a green dot) and 'Internal' (unselected, indicated by a red box and a red circle containing the number 3). A blue 'Save' button is located to the right.

The top right corner of the interface shows the user 'admin' and a 'Page Operation' dropdown menu.

FIT AP + AC recommended layer-3 networking

Check built-in portal auth template on AC web

The screenshot shows the DCN AC web interface. The top navigation bar includes tabs for Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The 'Authentication' tab is selected and highlighted with a red box and a red circle labeled '1'. The left sidebar contains a list of menu items, with 'Portal Auth Template' highlighted by a red box and a red circle labeled '2'. The main content area shows the 'Portal Auth Template' configuration page. It includes a table with the following columns: Template Name, Authentication Page Template, Successful Jump Page, User group, and Operation. The table contains one row for the 'Default' template. The table is highlighted with a red box.

Template Name	Authentication Page Template	Successful Jump Page	User group	Operation
Default	Default		default	 

FIT AP + AC recommended layer-3 networking

Built-in portal auth user management on AC web

The screenshot displays the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The 'User' menu item is highlighted with a red circle labeled '1'. The left sidebar shows 'User Management' highlighted with a red circle labeled '2'. The main content area shows the 'User Management' tab selected, with a red circle labeled '3' highlighting the 'Add' button (+ icon). Below the buttons is a table with columns: Account, Full Name, Phone Number, User group, and Operation. The table contains one row with 'null' in the Phone Number column.

Account	Full Name	Phone Number	User group	Operation
		null		

FIT AP + AC recommended layer-3 networking

Edit built-in portal auth user account on AC web

The screenshot displays the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System', and 'Upgrade'. The 'User' tab is selected. The left sidebar shows 'User Management'. The main content area has tabs for 'System Overview', 'Portal Auth Template', and 'User Management'. A 'Conditional Search' bar is present. Below it, a table with columns 'Account', 'Full Name', 'Phone Number', 'User group', and 'Operation' is shown. A modal dialog titled 'Add User' is open, containing the following fields:

- Account *: testuser
- Password *: testtest (with a toggle icon)
- Full Name: name_name
- Phone Number: 1234567890
- User group: default (with a dropdown arrow) and a '+ New group' button

At the bottom of the dialog are 'Save' and 'Cancel' buttons. The background table shows a single row with 'null' in the 'Full Name' column.

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FIT AP + AC recommended layer-3 networking

Check built-in portal auth user account on AC web

The screenshot shows the DCN User Management interface. The top navigation bar includes Monitor, Basic Network, Wireless, Authentication, User, System, and Upgrade. The left sidebar shows User Management. The main content area has tabs for System Overview, Portal Auth Template, and User Management. Below the tabs is a Conditional Search bar. A table of user accounts is displayed with columns: Account, Full Name, Phone Number, User group, and Operation. The 'testuser' account is highlighted with a red box. The table shows one user with the account 'testuser', full name 'name_name', phone number '1234567890', and user group 'default'. The bottom of the table shows pagination information: 1 page, 1 item, 10 items per page.

Account	Full Name	Phone Number	User group	Operation
testuser	name_name	1234567890	default	 

FIT AP + AC recommended layer-3 networking

Apply portal auth template to specific SSID on AC web

DCN

Monitor Basic Network Wireless Authentication User System Upgrade

admin

Setup Wizard AP Management SSID Management Wireless Client Wireless Managem...

System Overview External AAA Black&White List Other Auth Configuration Setup Wizard AP Management SSID Management Auth Page Template Port Settings Page Operation

General Configuration

NetworkID 1

SSID * DCN-test

Radio * ☒ 2.4G ☒ 5G 1 ☒ 5G 2

Hidden SSID * ☐ On ☒ Off

Terminal Isolation * ☐ On ☒ Off

Vlan * 1000

Advanced configuration

Uplink Bandwidth Per Client(Kbps) 0

Downlink Bandwidth Per Client(Kbps) 0

Time Limited Strategy + WDS Model * ☐ On ☒ Off

Security Configuration

Authentication Method * Portal Authentication

Portal Authentication Template Default

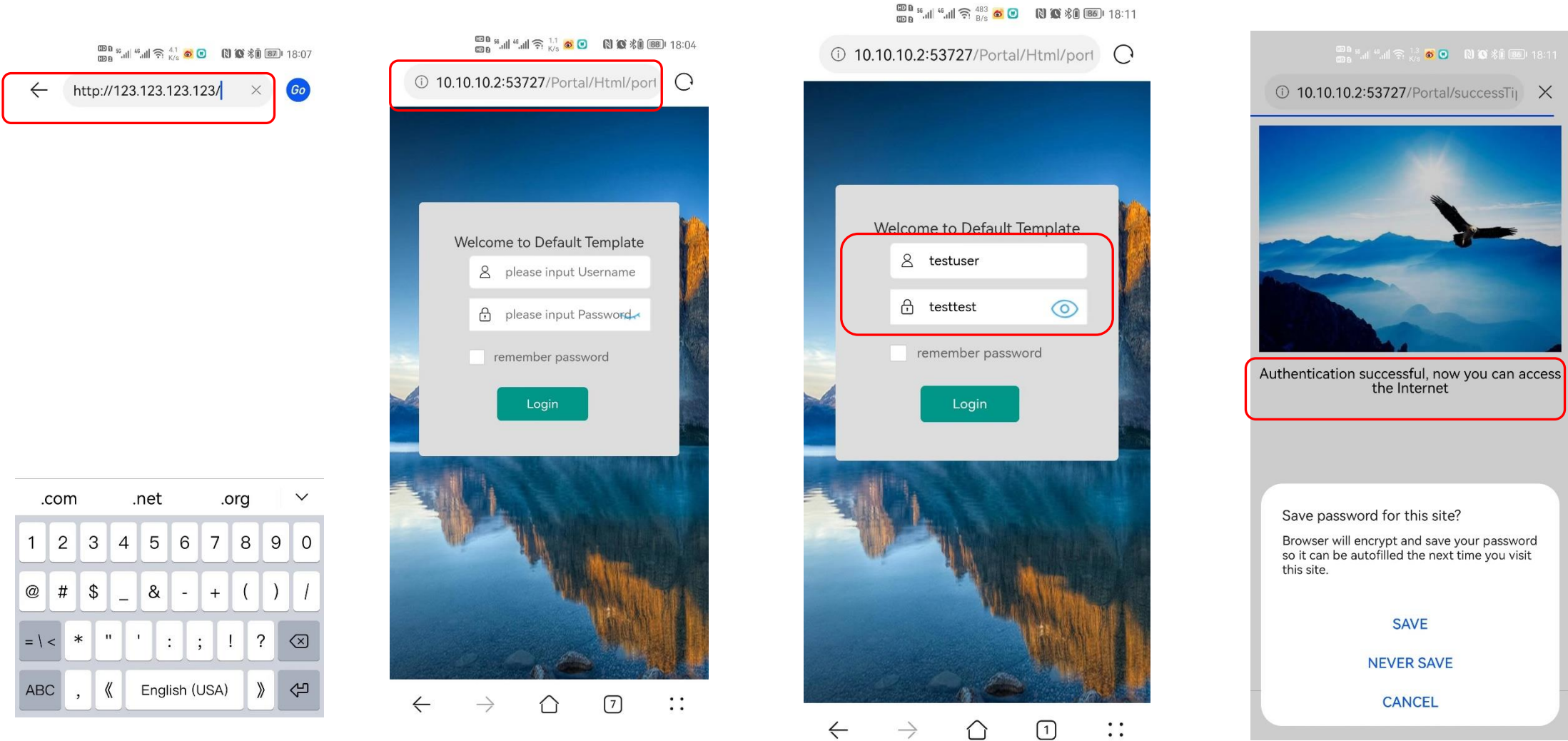
Select AP Group

An AP group can bind up to 16 SSIDs. An out of limit AP group cannot be selected.

To be selected	Selected AP Group
	DCN-test-ap-profile

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FIT AP + AC recommended layer-3 networking



FIT AP + AC recommended layer-3 networking

Check wireless client information on AC web

DCN

Monitor Basic Network **Wireless** Authentication User System Upgrade admin

System Overview Setup Wizard **1** Wireless Client

> Conditional Search

Client MAC	Client IPv4	SSID	AP MAC	Client Type	Uptime	NetBios Name	Operation
c2-f1-88-28-e8-46	200.200.200.4	DCN-test	00-03-0f-11-22-00	OXF-AN10	0d:00:08:31		Forced Offline

< 1 > go to 1 page confirm Totle 1 Items 10 Items/Page

- **FAT AP networking**
- **AP wired mesh networking**
- **FIT AP + AC simple layer-2 networking**
- **FIT AP + AC recommended layer-3 networking**
- **Cloud AP networking**

Cloud mode of AP networking

Enable cloud mode on AP web

DCN Running Status AP Mode ×

AP can work in three modes: fat AP mode, thin AP mode or cloud AP mode. In fat AP mode and cloud AP mode, AP exists as an independent individual in the network. In thin AP mode, you can manage it through AC. Fat mode can be divided into two specific modes routing mode and bridge mode. If AP is a gateway device, select routing mode; if AP is a bridge device, select bridge mode. The cloud AP mode is a bridge device, which is connected to the public cloud. The default mode is thin mode. If you need to modify it, please click the "Edit" button.

AP Mode Switch ☐ Fat Mode ☐ Fit Mode ☒ Cap Mode

Save Return

DCN Running Status AP Mode ×

Setup Wizard AP Mode Basic Settings Statistics System Maintenance

Device Information

Serial Number:	8102002V13C00123
Device Model:	WL8200-X1
Startup Mode:	Warm Start
Firmware Version:	5.1.1.30
Boot Version:	2.3.2
Running Time:	0 days 0 hours 36 minutes 8 seconds

Network Information

IP Address:	172.30.78.13
MAC Address:	00:03:0F:11:22:00
Default Gateway:	172.30.78.1
DNS Server:	202.103.44.150
Downlink VLAN:	1
Manage Status:	Have Been Managed discovery.dcnimcloud.com

03

Abnormal Situation Handling Guide

- **Basic information for troubleshooting**
- **How to restore AP & AC under boot mode**
- **How to retrieve AC password**
- **What to check if all APs are not online**
- **NAT traversal between AC and AP**
- **How to check BSSID from the same AP**

- **Basic information for troubleshooting**
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Basic information for troubleshooting- AP information

```
admin@Dcn:~# get system detail
```

Property	Value

username	admin
model	WL8200-WH2
version	3.8.2.38
country	CN
nmode-supported	Y
forty-mhz-supported-g	Y
forty-mhz-supported-a	Y
base-mac	00:03:0F:B0:55:90
base-mac-status	on
serial-number	WL021810IC07000200
country-code-is_configurable	1
device-type	61
reboot-mode	cold
usb-support	Y

Basic information for troubleshooting - AC information

DCWS-6028#show version

DCWS-6028 Device, Compiled on Jun 06 17:58:03 2020

sysLocation China

CPU MAC 00-03-0f-14-8f-a3

VLAN MAC 00-03-0f-14-8f-a2

Software Version 7.0.6.1(R0001.0057)

Bootrom Version 7.0.24

Hardware Version R01

CPLD Version 0.08

Serial No AA33004902

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Last reboot was cold reset.

Uptime is 0 weeks, 0 days, 0 hours, 5 minutes

Basic information for troubleshooting – AC information

DCWS-6028#show vendor

NAME	LEN	VALUE
-----	-----	-----
SwitchName	9	DCWS-6028
VersionPre	0	
VendNameEn	26	DC YunKe Networks Co.,Ltd.
VendNameBr	3	DCN
VendWWW	28	http://www.dcnetworks.com.cn
VendLocate	5	China
CopyRight	53	Copyright (C) 2001-2020 by DC YunKe Networks Co.,Ltd.
VendContact	12	400-810-9119
WebLogo	2729	
WebLogin	8683	
WebFacebd	21104	
WebBG	14685	
WebLang	2	cn
VendorOid	16	1.3.6.1.4.1.6339
DeviceOid	24	1.3.6.1.4.1.6339.1.5.1.9
KeyNeed	4	0
BaseMac	6	00 03 0f 03 00 00
CliStyle	3	0
HsrpNeed	4	0
DevType(ID)	4	508
ChassisCard	0	
FileVersion	9	10.19.253
IMGPrefix	0	

Basic information for troubleshooting – AC information

```

RomPrefix      0
HardWarePre    0
Prompt         0
UserName       5      admin
PassWord       5      admin
ManagelP       4      192.168.1.1
SupportAPs     3861
                1 DCWL_7952AP_R3  R3  DCWL_7952AP_R3, Indoor Single Radio a/b/g/n
                2 DCWL_7942AP_R3  R3  DCWL_7942AP_R3, Indoor Single Radio b/g/n
                3 DCWL_7962AP_R3  R3  DCWL_7962AP_R3, Indoor Dual Radio a/n, b/g/n
                4 DCWL_7962OT_R3_HP R3  DCWL_7962OT_R3_HP, Outdoor Dual Radio a/n, b/g/n
                5 DCWL_7942AP_R4  R4  DCWL_7942AP_R4, Indoor Single Radio b/g/n
                6 DCWL_7942AP_R4_HP R4  DCWL_7942AP_R4_HP, Indoor Single Radio b/g/n
                7 DCWL_7962AP_R4  R4  DCWL_7962AP_R4, Indoor Dual Radio a/n, b/g/n
                8 DCWL_7942AP_E   R1  DCWL_7942AP_E, Indoor Single Radio b/g/n
                9 DCWL_7962AP_E   R1  DCWL_7962AP_E, Indoor Dual Radio a/n, b/g/n
               10 DCWL_7962OT     R1  DCWL_7962OT, Outdoor Dual Radio a/n, b/g/n
               11 DCWL_7942AP_W   R1  DCWL_7942AP_W, Indoor Single Radio b/g/n
               12 DCWL_7942AP_WH  R1  DCWL_7942AP_WH, Indoor Single Radio b/g/n
               13 DCWL_7942OT_R3_HP R3  DCWL_7942OT_R3_HP, Outdoor Single Radio b/g/n
               14 DCWL_7962OT_R4_HP R4  DCWL_7962OT_R4_HP, Outdoor Dual Radio a/n, b/g/n
               15 DCWL_7942OT_R4_HP R4  DCWL_7942OT_R4_HP, Outdoor Single Radio b/g/n
               16 DCWL_7942AP_R4_5 R4_5 DCWL_7942AP_R4_5, Indoor Single Radio b/g/n
               17 DCWL_7962AP_R4_5 R4_5 DCWL_7962AP_R4_5, Indoor Dual Radio a/n, b/g/n
               21 DCWL_7942AP_R5   R5  DCWL_7942AP_R5, Indoor Single Radio b/g/n
               22 DCWL_7962AP_R5   R5  DCWL_7962AP_R5, Indoor Dual Radio a/n, b/g/n

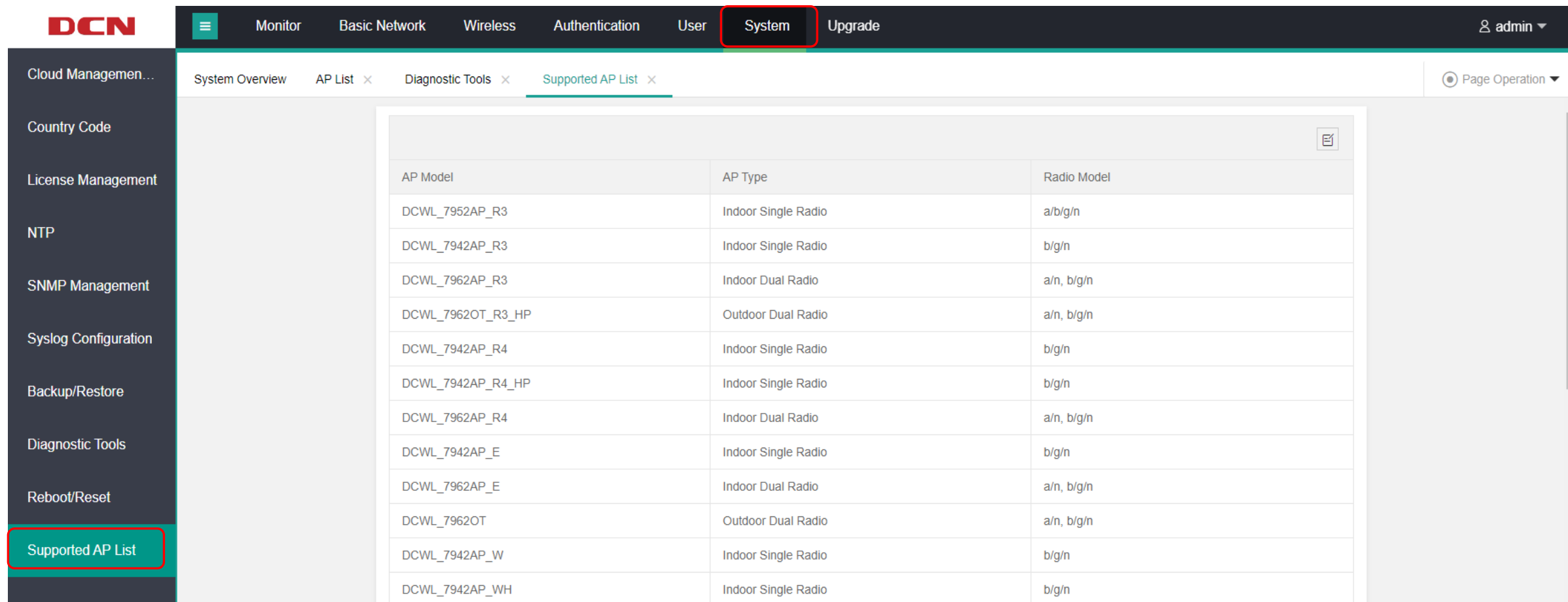
```

Basic information for troubleshooting – AC information

23 DCWL_7962OT_R5 R5 DCWL_7962OT_R5, Outdoor Dual Radio a/n, b/g/n
24 DCWL_7942AP_R5_1 R5_1 DCWL_7942AP_R5_1, Indoor Single Radio b/g/n
25 DCWL_7962AP_R5_1 R5_1 DCWL_7962AP_R5_1, Indoor Dual Radio a/n, b/g/n
26 DCWL_1000WAP_R1 R1 DCWL_1000WAP_R1, Indoor Single Radio b/g/n
27 DCWL_2000WAP_R1 R1 DCWL_2000WAP_R1, Indoor Single Radio b/g/n
28 DCWL-1000WAP R1.1 DCWL_1000WAP(R1.1), Indoor Single Radio b/g/n
29 WL8200-I2(R1) R1 WL8200-I2(R1), Indoor Dual Radio a/n/ac, b/g/n
30 WL8200-I3(R1) R1 WL8200-I3(R1), Indoor Dual Radio a/n/ac, b/g/n
31 DCWL_2000WAP(L) R1 DCWL_2000WAP(L), Indoor Single Radio b/g/n
32 EAP280(L) R1 EAP280(L), Indoor Single Radio b/g/n
33 DCWL_8200_W2 R1 DCWL_8200_W2, Indoor Dual Radio a/n/ac, b/g/n
36 DCWL-7962AP-D R1 DCWL-7962AP-D, Indoor Dual Radio a/n, b/g/n
37 DCWL_7942OT_R5 R5 DCWL_7942OT_R5, Outdoor Single Radio b/g/n
38 DCWL_7962OT_R6 R1 DCWL_7962OT_R6, Outdoor Single Radio b/g/n
39 WL8200-T2 R1 WL8200-T2, Outdoor Dual Radio a/n/ac, b/g/n
40 WL8200_T3 R1 WL8200_T3, Outdoor Dual Radio a/n/ac, b/g/n
41 WL8200-WL2 R1 WL8200-WL2, Indoor Dual Radio a/n/ac, b/g/n
42 WL8200-IT2 R1 WL8200-IT2, Outdoor Dual Radio a/n/ac, b/g/n
58 DCWL-2000WAP(R2) R2 DCWL-2000WAP(R2), Indoor Single Radio b/g/n
59 WL8200-I2(R2) R2 WL8200-I2(R2), Indoor Dual Radio a/n/ac, b/g/n
60 WL8200-I3(R2) R2 WL8200-I3(R2), Indoor Three Radio a/n/ac, b/g/n
61 WL8200-WH2 R1 WL8200-WH2, Indoor Dual Radio a/n/ac, b/g/n
62 WL8200-IT3 R1 WL8200-IT3(R1), Outdoor Dual Radio a/n/ac, b/g/n
63 WL8200-T3 R1 WL8200-T3(R1), Outdoor Dual Radio a/n/ac, b/g/n
64 WL8200-I1 R1 WL8200-I1, Indoor Dual Radio a/n/ac, b/g/n
65 WL8200-TL2 R1 WL8200-TL2, Outdoor Dual Radio a/n/ac, b/g/n
66 WL8200-TL1 R1 WL8200-TL1, Outdoor Single Radio b/g/n

Basic information for troubleshooting – AC information

Check supported AP list on AC web

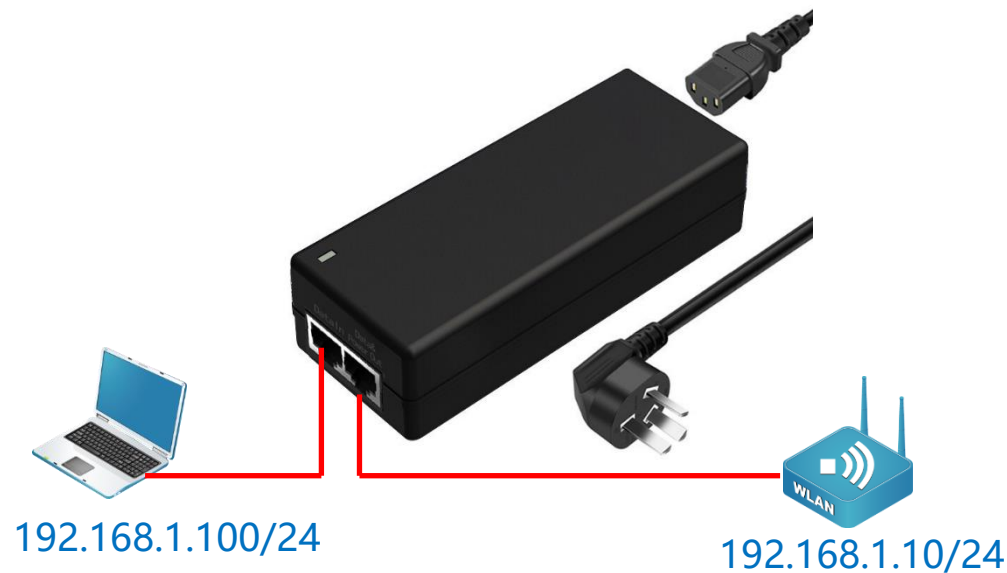


The screenshot shows the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System' (highlighted with a red box), and 'Upgrade'. The left sidebar contains various management options, with 'Supported AP List' highlighted by a red box. The main content area displays the 'Supported AP List' page, which includes a table of supported AP models, types, and radio models.

AP Model	AP Type	Radio Model
DCWL_7952AP_R3	Indoor Single Radio	a/b/g/n
DCWL_7942AP_R3	Indoor Single Radio	b/g/n
DCWL_7962AP_R3	Indoor Dual Radio	a/n, b/g/n
DCWL_7962OT_R3_HP	Outdoor Dual Radio	a/n, b/g/n
DCWL_7942AP_R4	Indoor Single Radio	b/g/n
DCWL_7942AP_R4_HP	Indoor Single Radio	b/g/n
DCWL_7962AP_R4	Indoor Dual Radio	a/n, b/g/n
DCWL_7942AP_E	Indoor Single Radio	b/g/n
DCWL_7962AP_E	Indoor Dual Radio	a/n, b/g/n
DCWL_7962OT	Outdoor Dual Radio	a/n, b/g/n
DCWL_7942AP_W	Indoor Single Radio	b/g/n
DCWL_7942AP_WH	Indoor Single Radio	b/g/n

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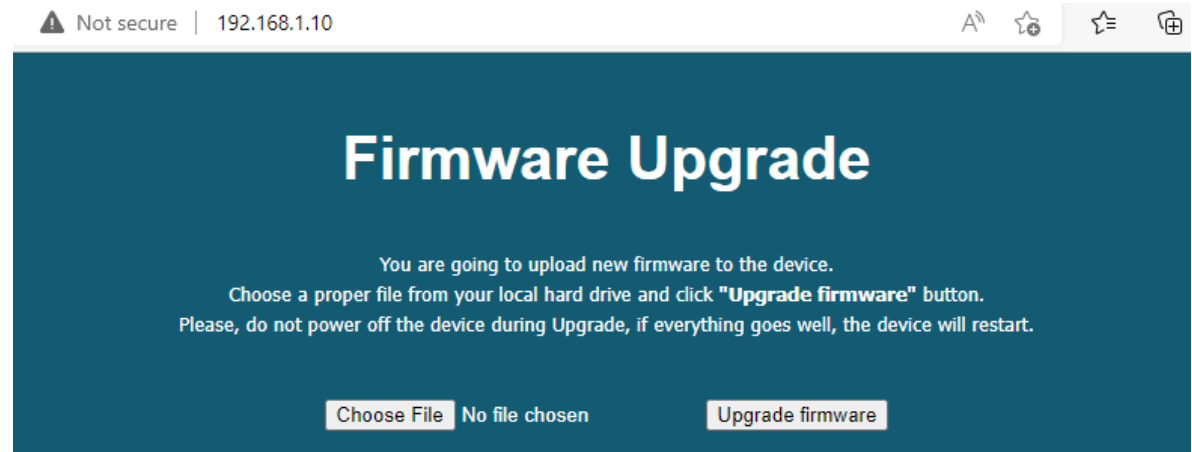
How to restore AP under boot mode



```
C:\Users\Caroline>ping 192.168.1.10
```

```
Pinging 192.168.1.10 with 32 bytes of data:  
Reply from 192.168.1.10: bytes=32 time=100ms TTL=128  
Reply from 192.168.1.10: bytes=32 time=50ms TTL=128  
Reply from 192.168.1.10: bytes=32 time=51ms TTL=128  
Reply from 192.168.1.10: bytes=32 time=51ms TTL=128
```

Press and hold the reset button of the AP and power up the AP. When the power indicator of AP is on, release the reset button after about 8 seconds. Then you can enter the Web interface of the AP boot mode.

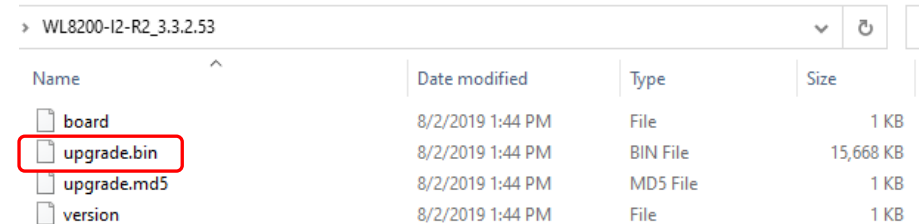


Note:

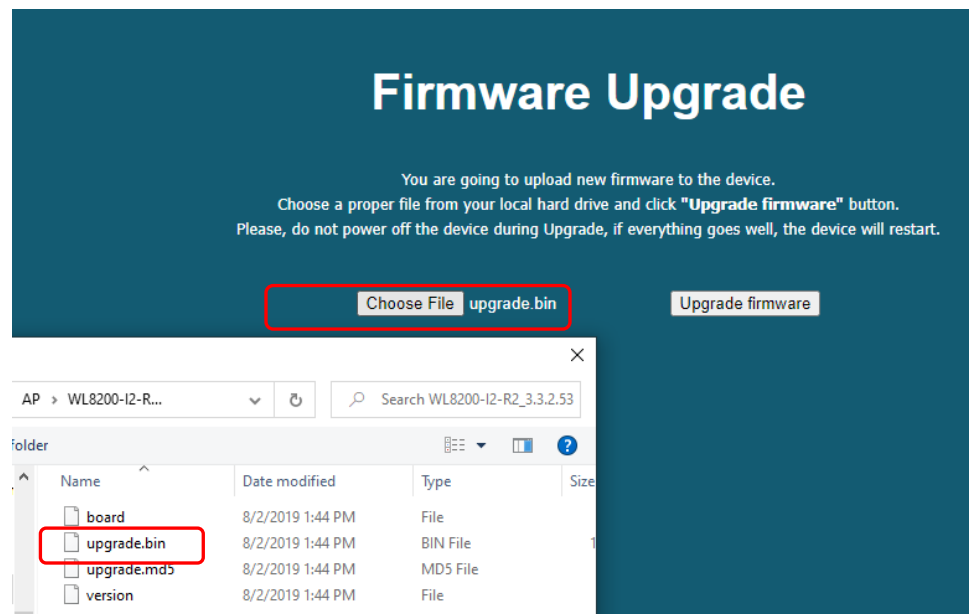
1. Under normal circumstances, you can ping the default IP address of the AP. If not, please try to reset the AP first.
2. You must use the http protocol, not the https protocol.

How to restore AP under boot mode

Unzip the AP firmware file "WL8200-xxxxx.tar", you can see the "upgrade.bin" file. Select that "upgrade.bin" file in the Web page, then click "upgrade firmware" and wait patiently for the AP to complete the repairment and the "upgrade success" page will appear.



WL8200-I2-R2_3.3.2.53			
Name	Date modified	Type	Size
board	8/2/2019 1:44 PM	File	1 KB
upgrade.bin	8/2/2019 1:44 PM	BIN File	15,668 KB
upgrade.md5	8/2/2019 1:44 PM	MD5 File	1 KB
version	8/2/2019 1:44 PM	File	1 KB



Check Success And Updating

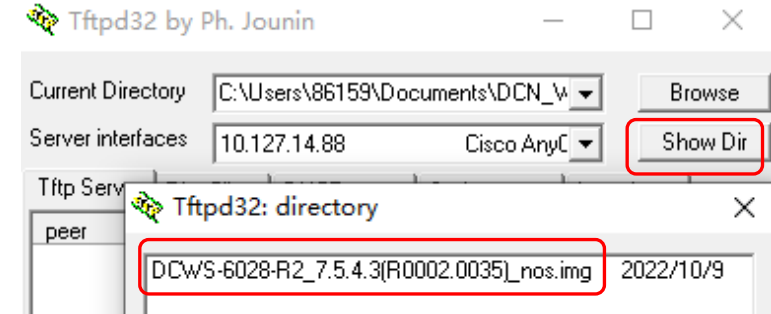
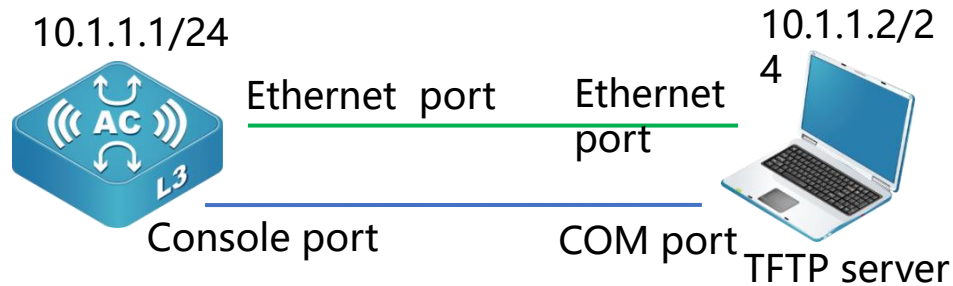
Don't power off.Update is in progress and you should wait for automatic reset of the device.
You can close this page.Update time depends on image size and may take up to a few minutes.

20%

Upgrade Success

The platform is upgraded successfully by the specified firmware.
The device is resetting automaticly,you can close this page or restart the device.

How to restore AC under boot mode



Bootrom version: 8.0.11

Creation date: Mar 9 2022 - 21:18:51

Testing RAM...
0x10000000 RAM OK.

(Re)start USB...

USB0: Port (usbActive) : 0 Interface (usbType = 2) : USB
EHCI 1.00

scanning bus 0 for devices... 1 USB Device(s) found
scanning usb for storage devices... 0 Storage Device(s)
found

scanning usb for ethernet devices... 0 Ethernet Device(s)
found

[Boot]:

[Boot]: showconfig

Host IP Address: 10.1.1.1

Server IP Address: 10.1.1.2

[Boot]:

If you can enter the boot command line of AC, you can perform the following steps to try to repair.

(1) Get the effective IP address in AC and the IP address of TFTP server.

[Boot]: **showconfig**

(2) Configure the IP address of the debugging computer as the IP address of the TFTP server and start the TFTP service.

(3) [Boot]: **run tftp:DCWS-6028-R2_7.5.4.3(R0002.0035)_nos.img**

(4) After the above operations are completed normally, you can enter the CLI of AC, and then perform upgrade operation in the CLI.

**copy tftp://10.1.1.2/DCWS-6028-R2_7.5.4.3(R0002.0035)_nos.img
nos.img**

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How to retrieve AC password

```
[Boot]: dir
Scanning JFFS2 FS: . done.
-rw-r--r-- 10201 Thu Jan 01 04:02:15 1970
startup20220810.cfg
-rw-r--r-- 4571 Fri Jan 02 19:44:37 1970 startup_20220630.cfg
-rw-r--r-- 32 Thu Jan 01 02:27:26 1970 configCtrl.licx
-rw-r--r-- 2673 Fri Jan 02 00:40:07 1970 startup.cfg
-rw-r--r-- 70 Fri Jan 02 00:40:07 1970 portal-locale.cfg
-rw-r--r-- 6707 Thu Jan 01 00:55:04 1970
startup_20220801.cfg
-rw-r--r-- 3754 Thu Jan 01 03:06:44 1970 startup-1x.cfg
-rw-r--r-- 245 Thu Jan 01 00:00:25 1970 dh1024.pem
-rw-r--r-- 156 Thu Jan 01 00:00:25 1970 dh512.pem
-rw-r--r-- 245 Thu Jan 01 00:00:25 1970 wsdh1024.pem
-rw-r--r-- 156 Thu Jan 01 00:00:25 1970 wsdh512.pem
-rw-r--r-- 928 Thu Jan 01 00:00:25 1970 wssl2_cert.pem
-rw-r--r-- 916 Thu Jan 01 00:00:25 1970 wssl2_key.pem
-rw-r--r-- 48 Thu Jan 01 00:00:38 1970 default_license.lic
-rw-r--r-- 23238357 Thu Jan 01 23:20:18 1970 nos.img
[Boot]:
[Boot]: boot startup-config null
...default factory-config will be used.
[Boot]:
[Boot]: reboot
```

Note:

After the left side operations, the switch will start with the factory configuration and be able to enter the CLI normally. The username and password are the default. Never execute the 'write' command after entering CLI.

```
DCWS-6028-C#type startup.cfg
!$1,511
!
no service password-encryption
!
hostname DCWS-6028-C
sysLocation China
sysContact 400-810-9119
!
authentication logging enable
!
username admin privilege 15 password 0 admin
!
authentication line console login local
!
```

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What to check if all APs are not online

If all APs are not online, please check these aspects in turn.

Check IP and Port

- Generally, check whether the IP addresses of AC and AP can reach each other through ping command. Except for Traversing NAT scenario.
- Configure the wireless management IP address of AC statically in FIT AP to check whether the network and port are normal.

Check Device-type and AP mode

- Check whether the vendor file of AC contains the device-type of AP.
- Check whether the mode of AP is FIT.

Check configuration and debug info

- Check whether the relevant commands and services are normal in the CLI of AC.
- Configure the relevant debug command in the CLI of AC for analysis and judgment.

What to check if all APs are not online

Check IP connection on AC web

The screenshot displays the DCN AC web interface. The top navigation bar includes 'Monitor', 'Basic Network', 'Wireless', 'Authentication', 'User', 'System' (highlighted with a red box), and 'Upgrade'. The left sidebar lists various management functions, with 'Diagnostic Tools' highlighted by a red box. The main content area shows the 'Diagnostic Tools' tab selected, with sub-tabs for 'Ping Tools' and 'Trace Route' (both highlighted with red boxes). The 'Ping Tools' section contains a 'Destination IP' input field, a 'Times' dropdown menu set to '1', and an 'Execute Ping' button. Below these is an 'Information Display' area.

What to check if all APs are not online

DCWS-6028#ping ?

A.B.C.D Destination ipv4 address

ethernet Ethernet

host Ping destination hostname <1-64>

character

src Use ipv4 source address option

vrf VPN Routing/Forwarding instance

<cr>

DCWS-6028#traceroute ?

A.B.C.D Trace route to destination address

ethernet Ethernet

host Trace route to destination hostname

source Use ipv4 source address option

vrf VPN Routing/Forwarding instance

What to check if all APs are not online - AC CLI

```
DCWS-6028#show wireless
```

```
Administrative Mode..... Enable
Operational Status..... Enabled
WS IP Address..... 10.10.10.2
WS IPv6 Address..... ----
WS Auto IP Assign Mode ..... Disable
WS Switch Static IP ..... 10.10.10.2
WS Switch Static IPv6 ..... ----
AP Authentication Mode..... None
AP Auto Upgrade Mode..... Disable
AP Independent Auto Upgrade Mode..... Disable
AP Validation Method..... Local
```

What to check if all APs are not online - AP CLI

```
admin@Dcn:~# sh
```

```
BusyBox v1.30.1 () built-in shell (ash)
```

```
admin@Dcn:~# cd /tmp/
```

```
admin@Dcn:/tmp# touch consoleredirect
```

```
admin@Dcn:/tmp# ubus call mapd
```

```
show_disc_info
```

```
mapd show disc info.
```

```
static sw ip num = 1.
```

```
static sw ip[0] = 192.168.1.254
```

```
provision ip primary ipv4 = 192.168.1.254
```

```
dhcp sw ip num = 1.
```

```
dhcp sw ip[0] = 10.10.10.2
```

```
dhcpv6 sw ip num = 0.
```

```
ac_domain: www.acaddr.com
```

```
dns sw ip[0] = 0.0.0.0
```

```
dns sw ip[1] = 0.0.0.0
```

```
dns sw ip[2] = 0.0.0.0
```

```
dns sw ip[3] = 0.0.0.0
```

If you login CLI of AP with telnet,
you need to redirect the
debugging information to the
telnet terminal.

What to check if all APs are not online – AC CLI

- ◆ Default Configuration: The debug command is off by default.
- ◆ Use relevant debug command:
 - ◆ Can only operate in the CLI of AC;
 - ◆ If you log in to AC through Telnet, you need to add command “AC#**terminal monitor**” .

```
DCWS-6028#debug wireless discovery detail
```

```
detail WD_LEVEL_DISC_INFO debug is on
```

```
DCWS-6028#
```

```
DCWS-6028#debug wireless discovery packet all
```

```
packet WD_LEVEL_DISCOVERY_IP_TX debug is on
```

```
packet WD_LEVEL_DISCOVERY_L2_TX debug is on
```

```
packet WD_LEVEL_INITIAL_ID_TX debug is on
```

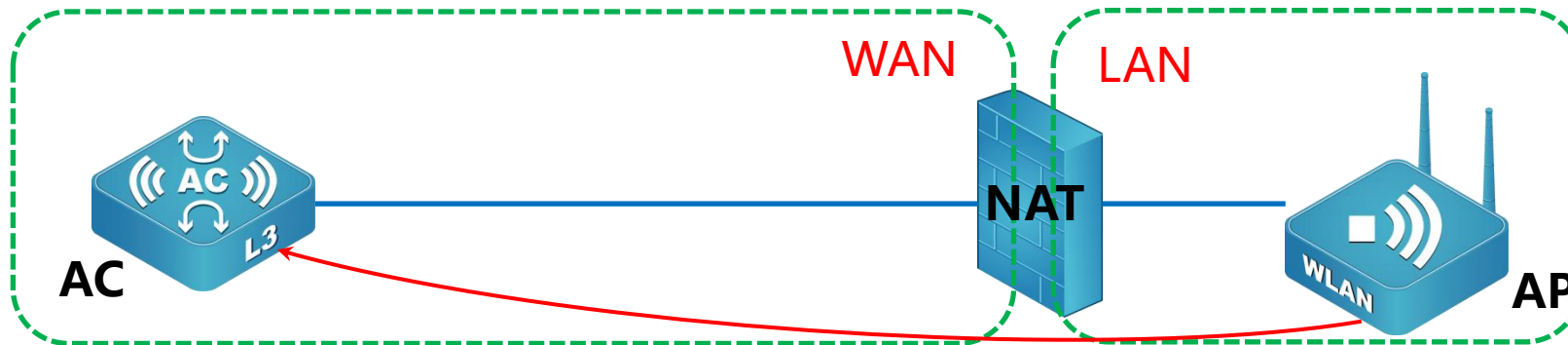
```
packet WD_LEVEL_DISCOVERY_IP_RX debug is on
```

```
packet WD_LEVEL_DISCOVERY_L2_RX debug is on
```

```
packet WD_LEVEL_INITIAL_ID_RX debug is on
```

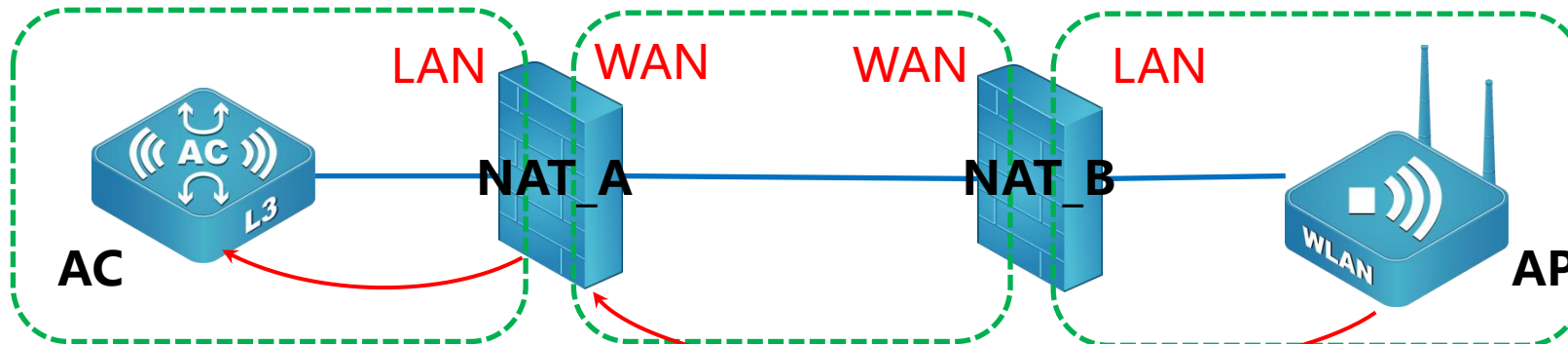
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Traversing NAT scenario analysis – AP online process



Destination address: AC
Destination port: UDP 57776、TCP 57777

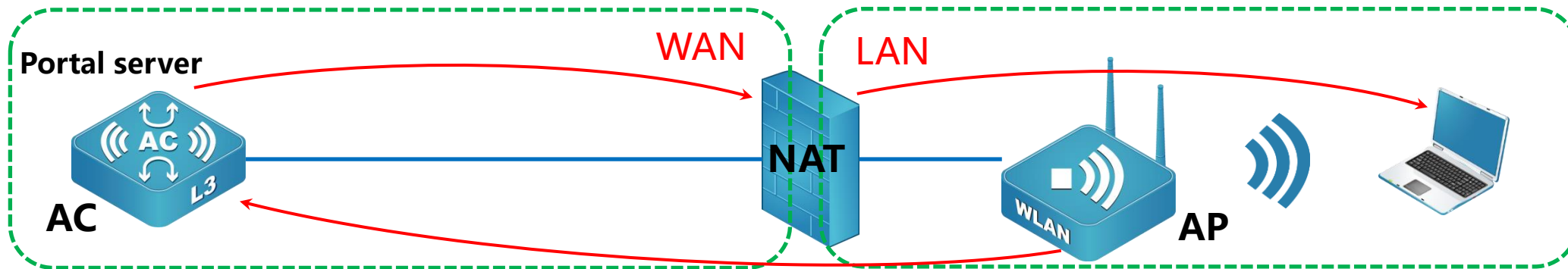
AC is located on WAN side of NAT device. Although AP is on LAN side, AP can directly access AC, so no special configuration is required on NAT device for AP going online.



Destination address: NAT_A
Destination port: UDP 57776、TCP 57777

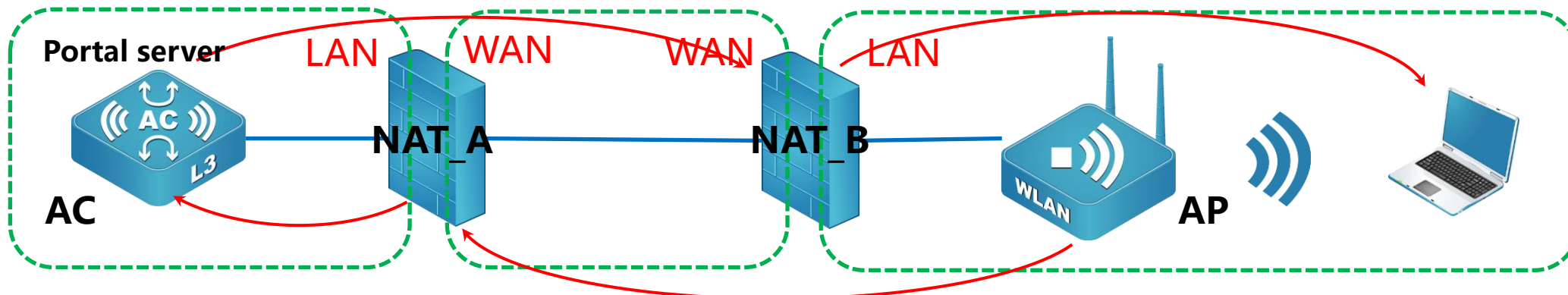
When the AC is on the LAN side of the NAT device, the discovery message sent by the AP needs to be forwarded to reach the AC. Therefore, port mapping rules need to be configured on NAT_A to forward UDP message arriving at NAT_A with destination port number 57776 and TCP message with destination port number 57777 to AC.

Traversing NAT scenario analysis – AC Redirect portal page



Destination address: AC

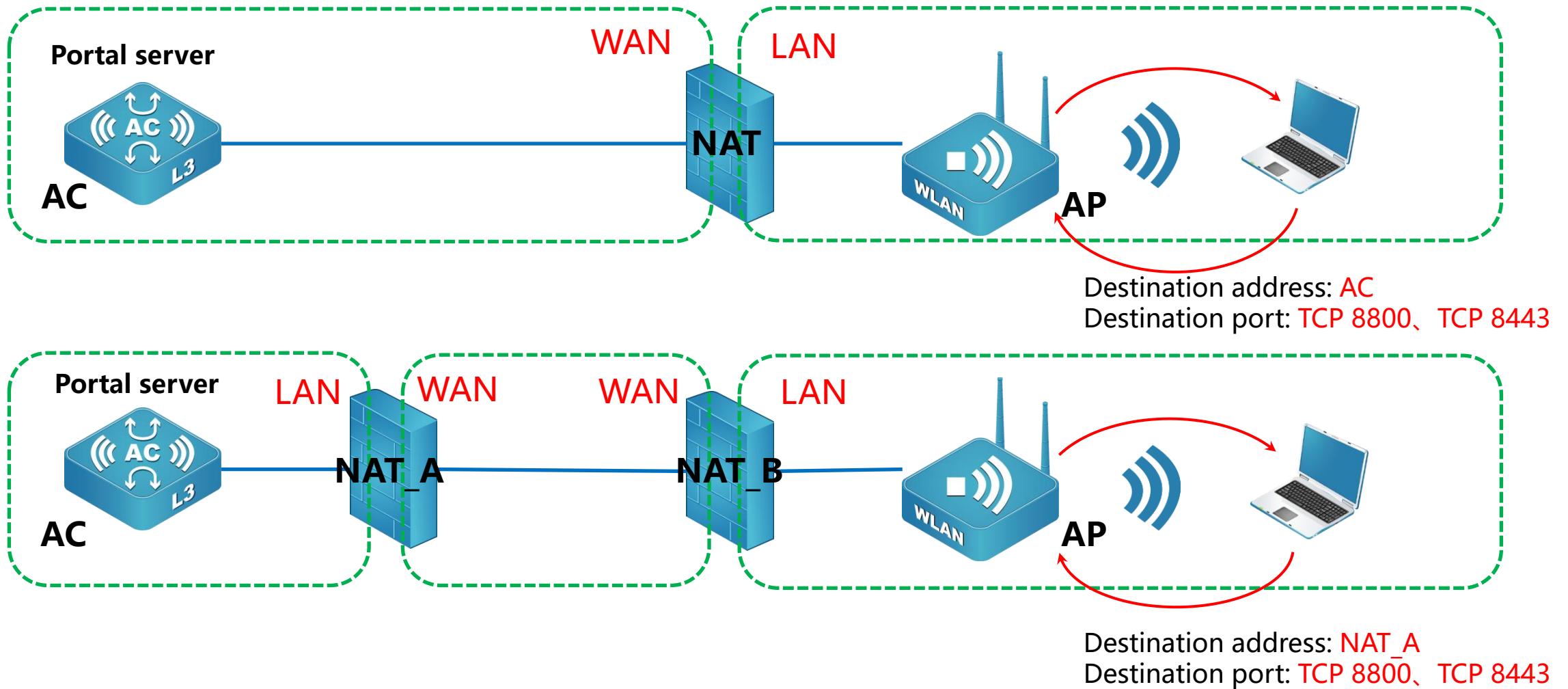
Destination port: TCP 53725, TCP 53726, TCP 8800, TCP 8443



Destination address: NAT_A

Destination port: TCP 53725, TCP 53726, TCP 8800, TCP 8443

Traversing NAT scenario analysis – AP Redirect portal page



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How to check BSSID from the same AP

Report from Wi-Fi scanning software:

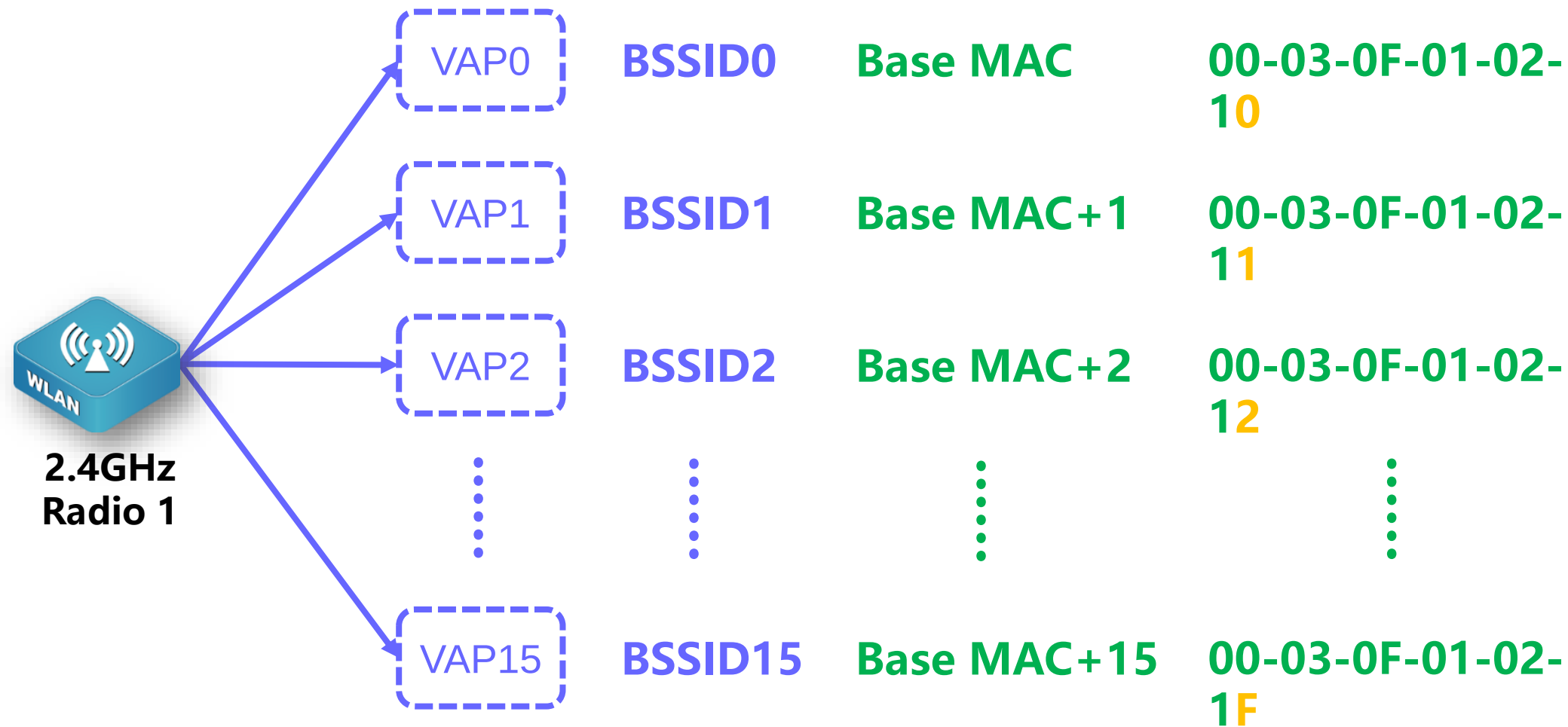
SSID	MAC Address	RSSI	Chan	Max Speed	WEP	WPA	WPA2	WPA3	WPS	Vendor
Yunke_WLAN	00:03:0F:83:DA:81	-50	36+44	866.7 Mbps		PSK-(TKIP CCMP)	PSK-(TKIP CCMP)			Digital China (Shanghai) Network
DCN	00:03:0F:83:DA:80	-50	36+44	866.7 Mbps Open						Digital China (Shanghai) Network
DCN_WLAN	00:03:0F:DA:6C:C0	-19	11	286.8 Mbps Open						Digital China (Shanghai) Network
60	00:03:0F:83:D3:12	-74	6	144.4 Mbps Open						Digital China (Shanghai) Network
Yunke_WLAN	00:03:0F:83:D3:11	-71	6	144.4 Mbps		PSK-(TKIP CCMP)	PSK-(TKIP CCMP)			Digital China (Shanghai) Network
DCN	00:03:0F:83:D3:10	-65	6	144.4 Mbps Open						Digital China (Shanghai) Network
DCN_WLAN	00:03:0F:DA:6C:D0	-37	149+153	1201 Mbps Open						Digital China (Shanghai) Network
Yunke_WLAN	00:03:0F:83:D3:21	-73	36+44	866.7 Mbps		PSK-(TKIP CCMP)	PSK-(TKIP CCMP)			Digital China (Shanghai) Network
DCN	00:03:0F:83:D3:20	-74	36+44	866.7 Mbps Open						Digital China (Shanghai) Network
60	00:03:0F:78:B4:82	-50	6	144.4 Mbps Open						Digital China (Shanghai) Network
Yunke_WLAN	00:03:0F:78:B4:81	-48	6	144.4 Mbps		PSK-(TKIP CCMP)	PSK-(TKIP CCMP)			Digital China (Shanghai) Network
DCN	00:03:0F:78:B4:80	-50	6	144.4 Mbps Open						Digital China (Shanghai) Network
60	00:03:0F:83:E4:B2	-22	1	144.4 Mbps Open						Digital China (Shanghai) Network
Yunke_WLAN	00:03:0F:83:E4:B1	-21	1	144.4 Mbps		PSK-(TKIP CCMP)	PSK-(TKIP CCMP)			Digital China (Shanghai) Network
DCN	00:03:0F:83:E4:B0	-26	1	144.4 Mbps Open						Digital China (Shanghai) Network

ESSID

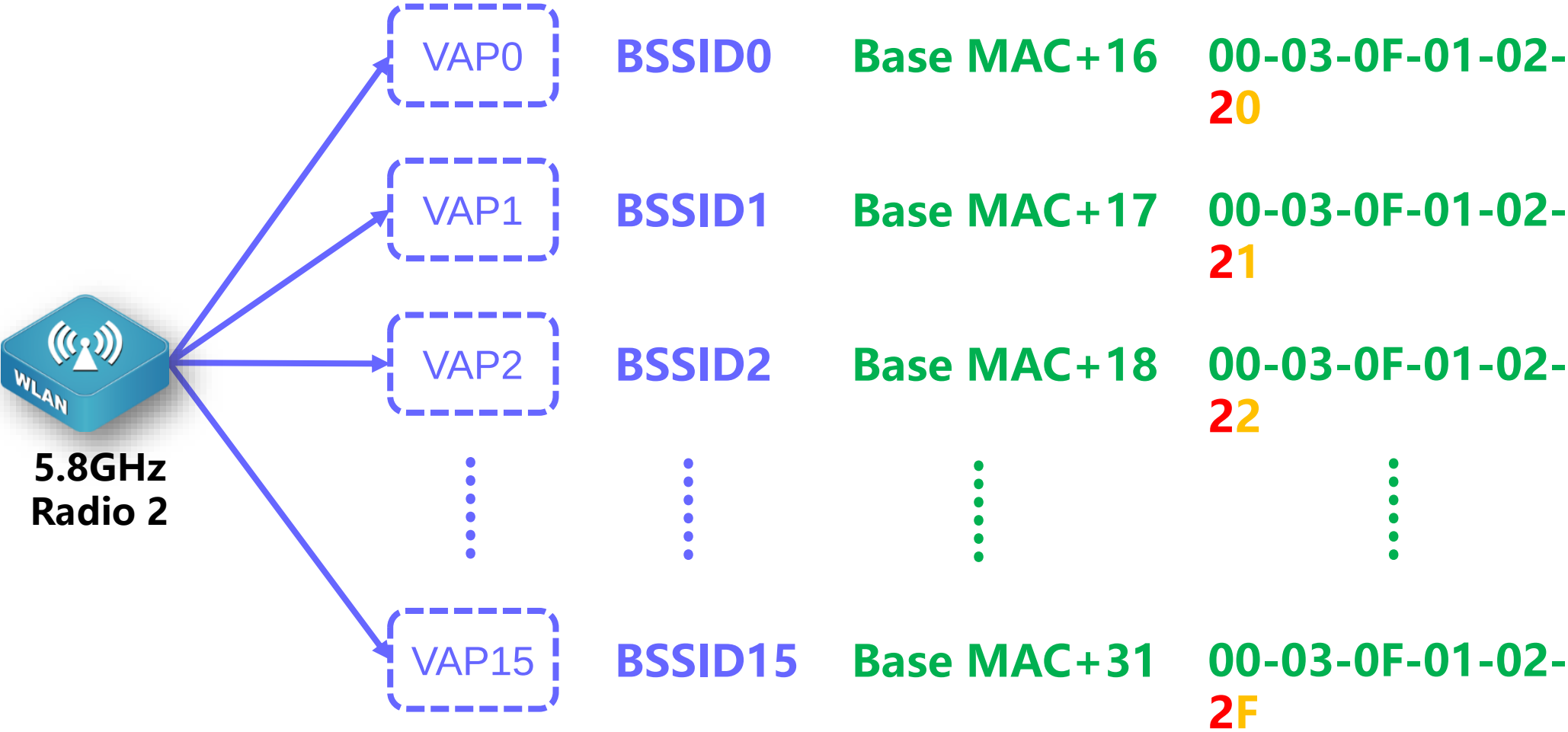
BSSID

They are BSSIDs generated by the same AP.
The MAC address of this AP is 00-03-0F-DA-6C-C0.

How to check BSSID from the same AP



How to check BSSID from the same AP



How to check BSSID from the same AP

