

QNAP

Specially made for Ubuntu Linux & QNAP NAS

QWA-AC2600 Dual band dual concurrent
wireless PCIe expansion NIC



Easy to build a network for your device

1

Wireless
network card
advantages

2

QWA-AC2600
Introduction

3

Build a AP
station
step-by-step

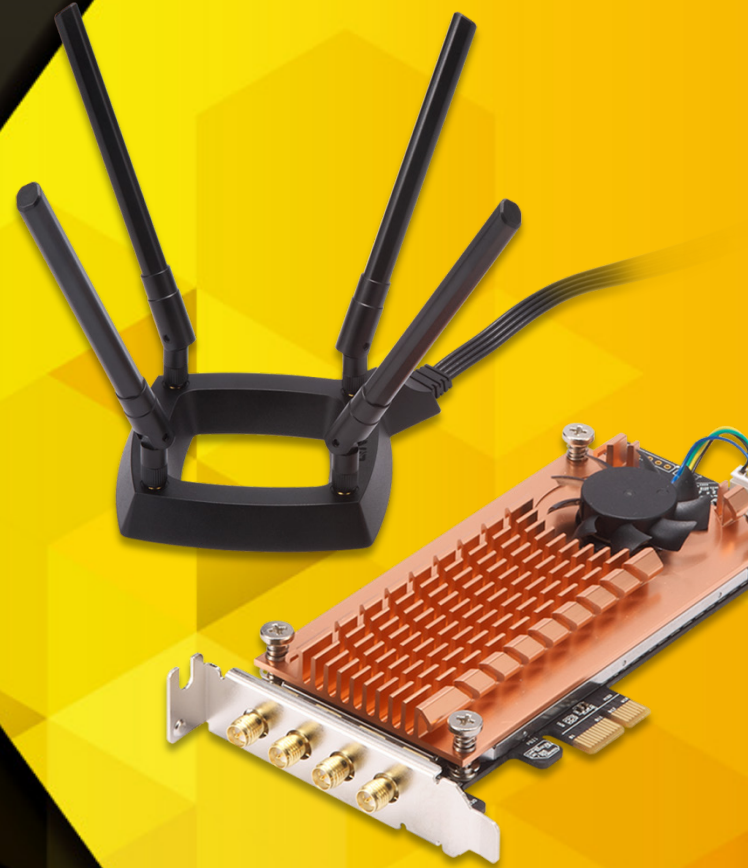
4

Application
introduction

QNAP

1

Wireless network card advantages



What are the advantages of wireless network card?

- ➔ **Direct access** to wireless terminal data, effectively reducing the physical wireless routers loading.
- ➔ QWA-AC2600 provides 5Ghz and 2.4Ghz dual-band, allow **working together at some time**.
- ➔ **Flexible configuration and expansion**, one single PC/NAS can be configured with 2 or more NICs for expansion
- ➔ Create **private network** applications

Good news for DIY maker

Build your own wireless
network base station

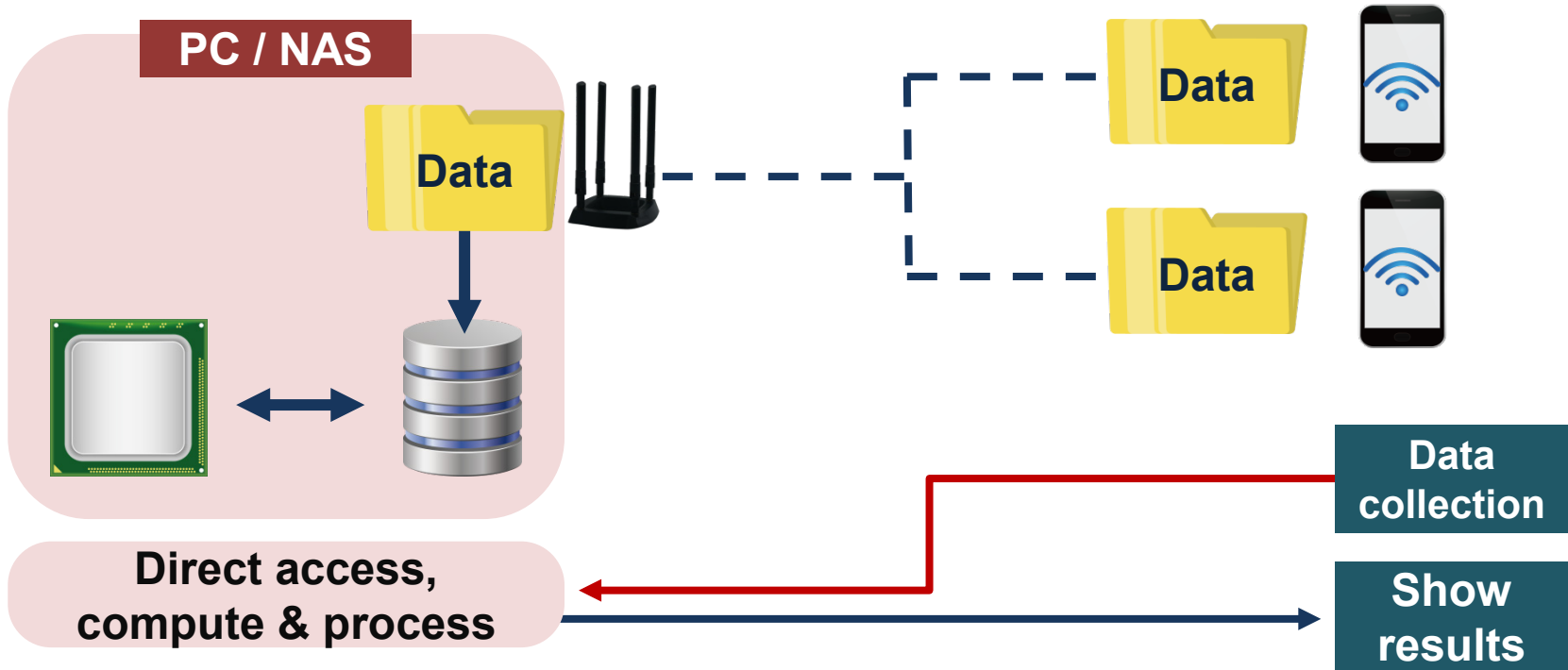


Ubuntu
system



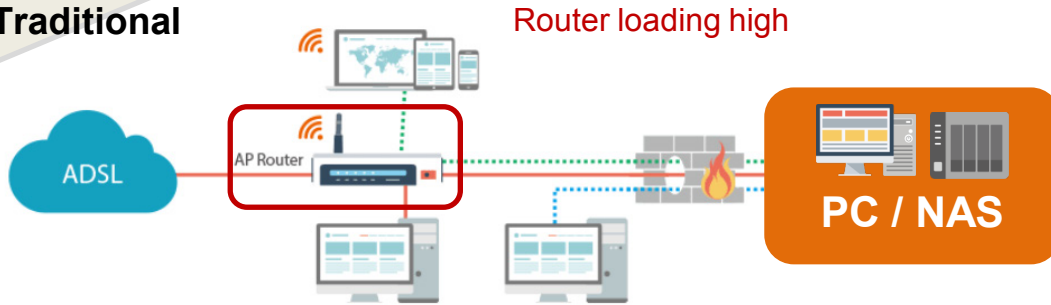
QWA-AC2600

Wireless edge computing



Enjoy network optimization with traffic shunting

Traditional



Separate NAS traffic to avoid busy routers slowing down the network

NOW



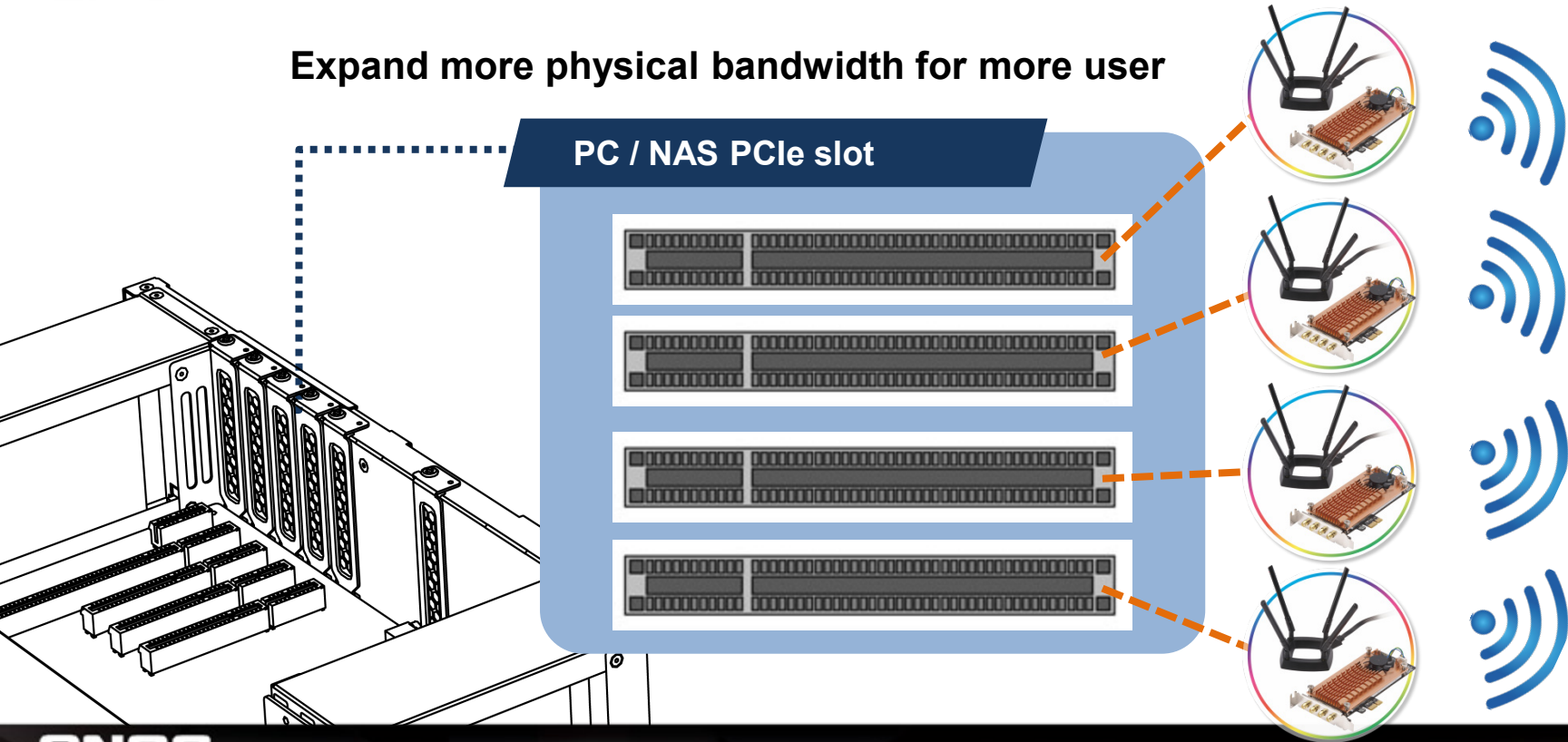
Set up a flexible wireless environment

Through QWA-AC2600 dual IC design, It allow dual-band working at some time, 1 band as client and 1 band as AP.



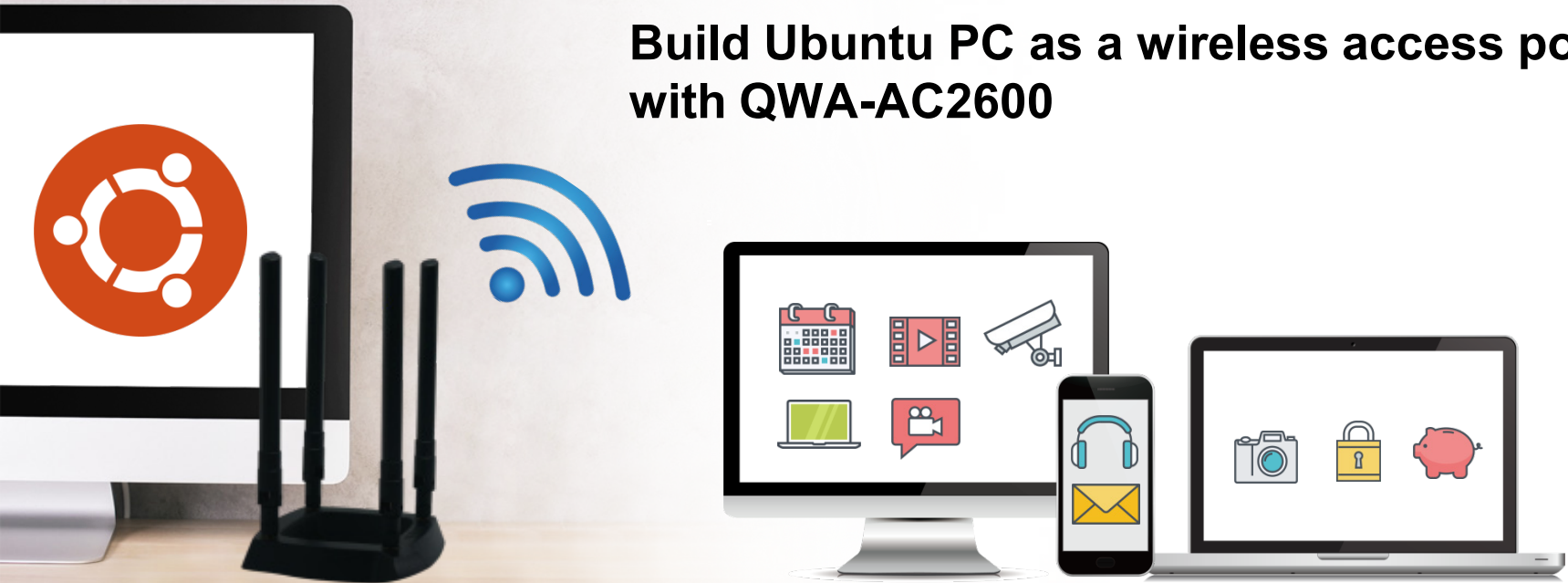
Add multiple expansion wireless NICs IN A PC/NAS

Expand more physical bandwidth for more user



Turn Ubuntu PC into wireless AP

Build Ubuntu PC as a wireless access point
with QWA-AC2600



Turn QNAP NAS into wireless AP

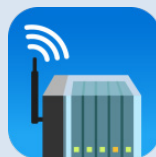
TS-253Be



QWA-AC2600



WirelessAP
Station app



Supports NAS models with PCIe slot(s)

ARM-based processor

- TS-x31XU
- TS-832X
- TS-1635, TS-1635AX
- *TS-531P, TS-531X, TS-831X

*QTS 4.3.5 or newer required



x86-based processor

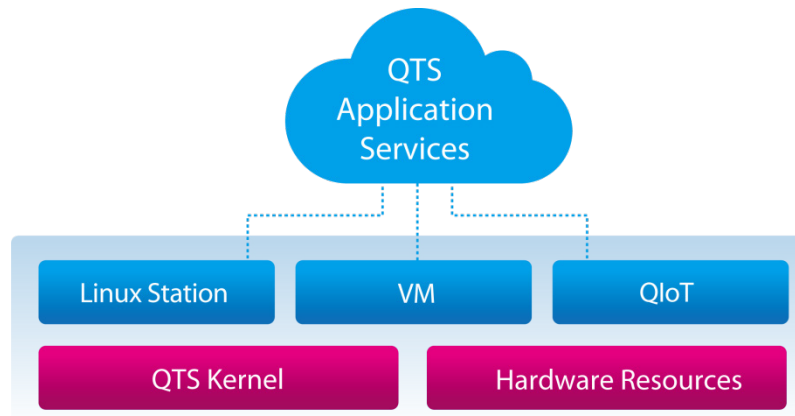
- TS-x53B/x53Be, TS-x53BU
- TVS-x63, TS-x63U
- TVS-x73/x73e, TS-x73U
- TS-x77
- TVS-x82/x82T, TVS-1582TU



Freely set up independent, secure wireless connection interface

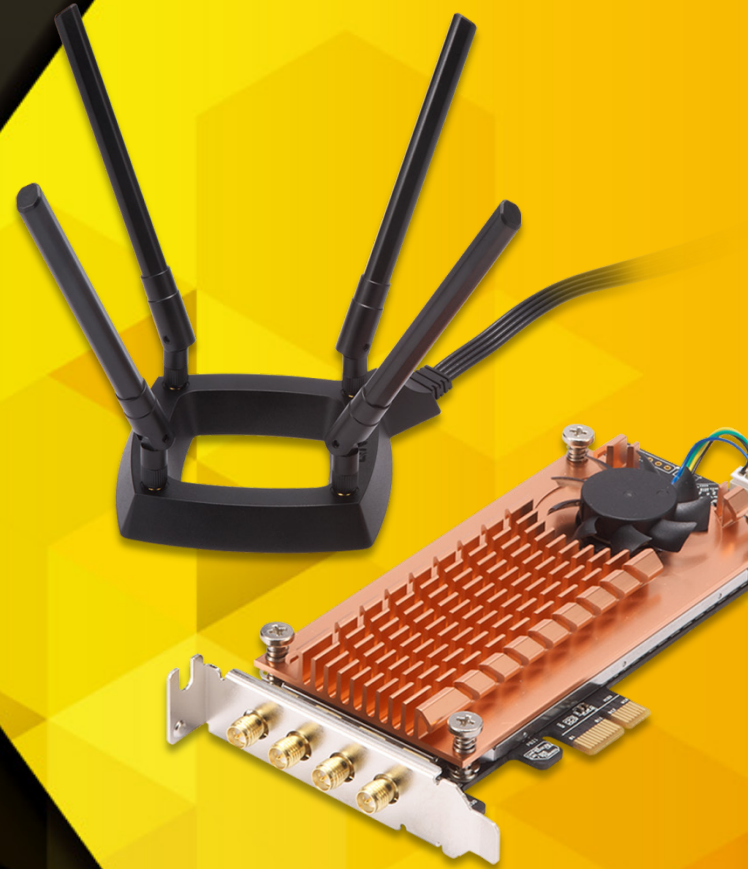
you can also assign individual NICs to the Container or use different QNAP services as required through integration with QNAP Network & Virtual Switch, and enjoy a separate wireless connection interface.

For example: If you need to set up a private IOT environment, you can set it up to not pass through any other devices, so that your IoT network becomes a highly secure and reliable independent network.



QNAP

2 **QWA-AC 2600**
introduction



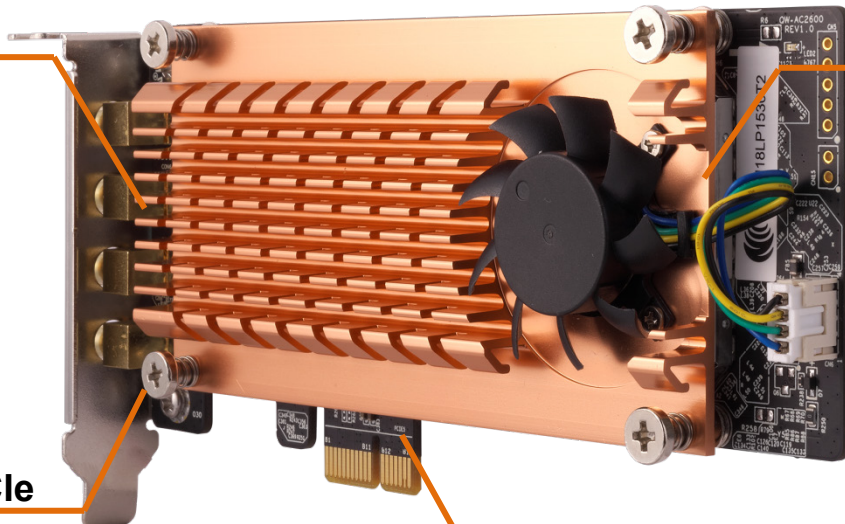
QWA-AC2600 PCIe wireless NIC

4 X Detachable RP-SMA connector

For extending to Quad-antenna magnetic base

Low profile PCIe

3 size bracket for all QNAP NAS
(include X70 model)



Active cooling module to ensure the transmission quality

Adjust the 3-level fan speed by real time chip temperature

Up to 500 MB/s PCIe bandwidth

With a PCIe 2.0 x1 interface

5 GHz and 2.4 GHz dual band

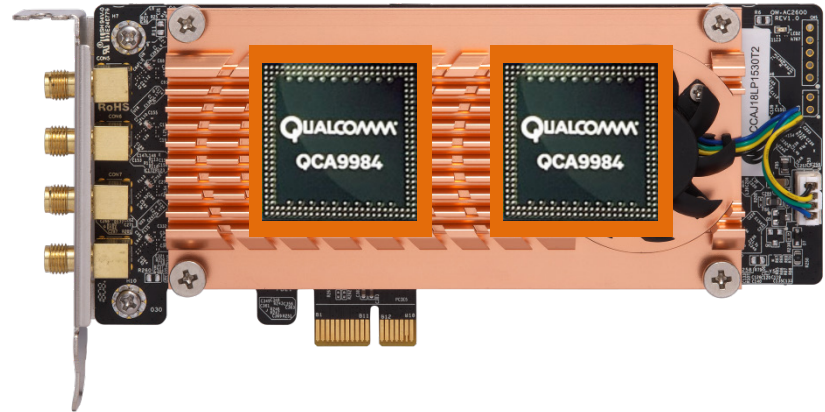
Up to 2600 Mbps total bandwidth

802.11ac (5GHz): up to 1733 Mbps

802.11n (2.4GHz): up to 800 Mbps



Dual Qualcomm QCA9984
support Dual Band Dual
Concurrent



High mobility Quad-antenna base

0.8 m RF high frequency coaxial cable

For optimized antenna placement

4 detachable omni-directional high gain antennas

Upgrade or replace the antenna by demand



Flexible deployments with the antenna base



Wall-mount

Attached on the wall or ceiling



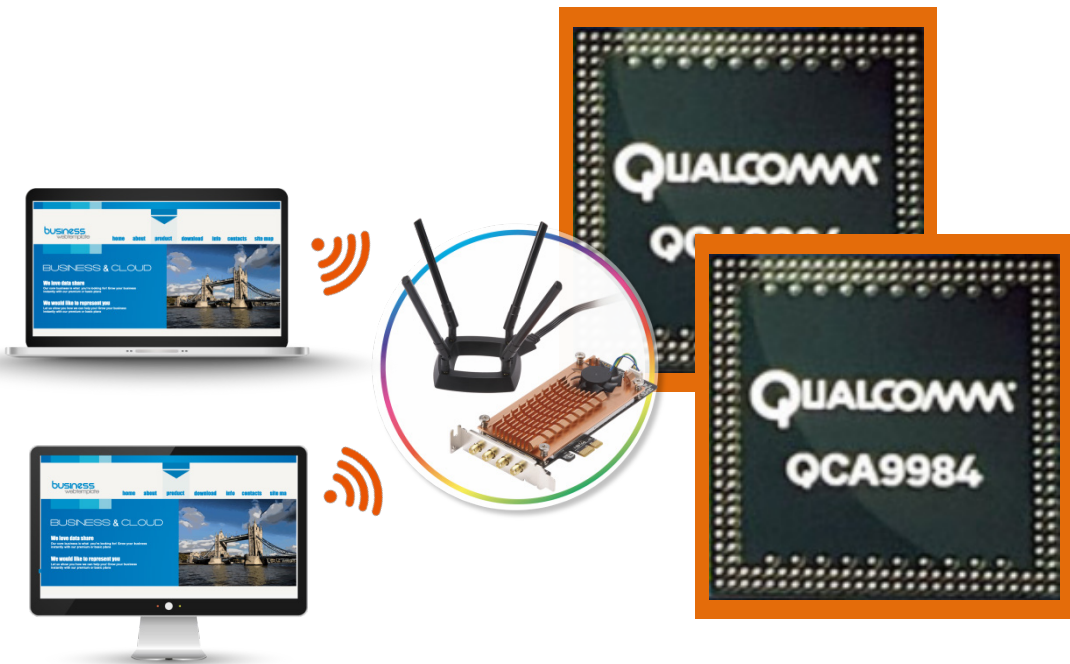
Magnetic

Attached to metal surfaces

2 Qualcomm QCA9984 wireless NIC

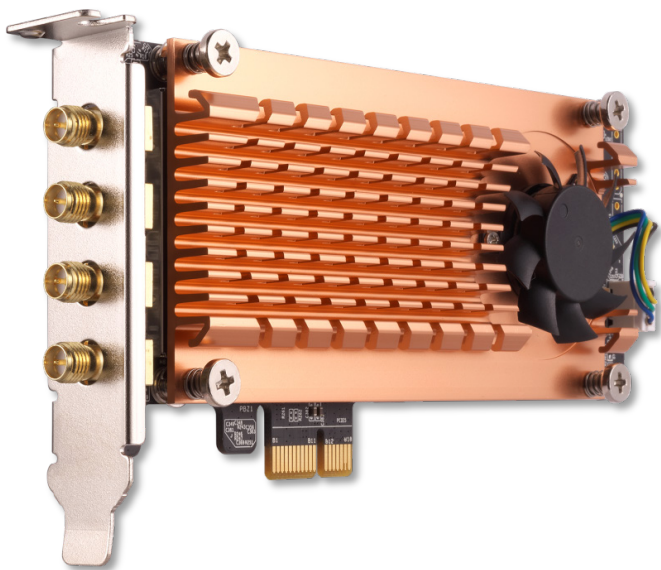
4 x 4 MU-MIMO

- Simultaneously communicate with multiple devices
- Compliant with IEEE 802.11ac wave 2
- Compatible with IEEE 802.11ac, IEEE 802.11n and IEEE 802.11a/b/g



All QNAP NAS PCIe card bracket

Low profile PCIe expansion card design



Low profile bracket



Special half height bracket
(For some QNAP NAS)



Standard full height bracket

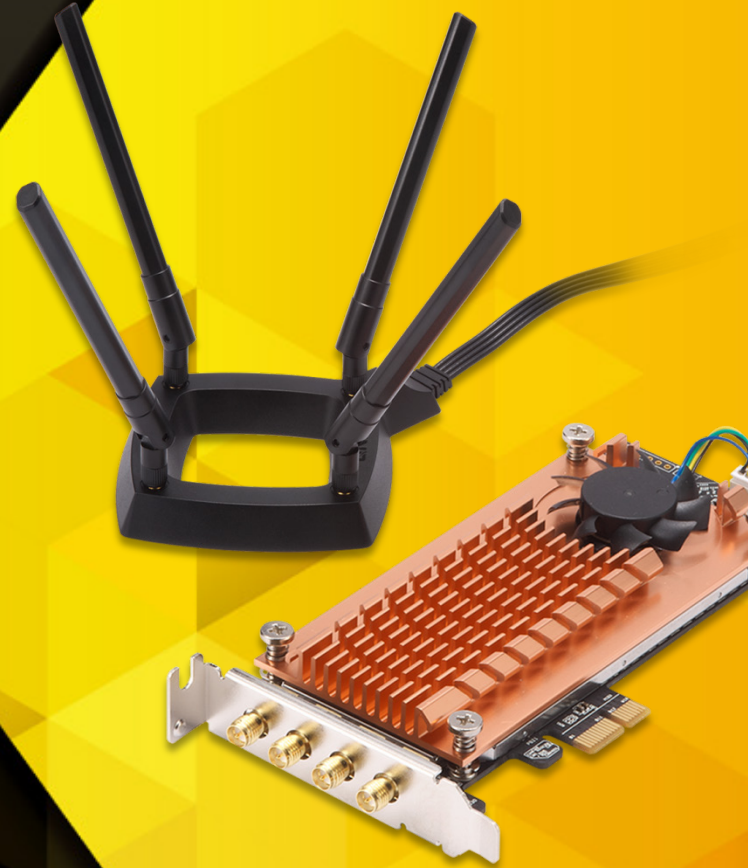


QNAP

3

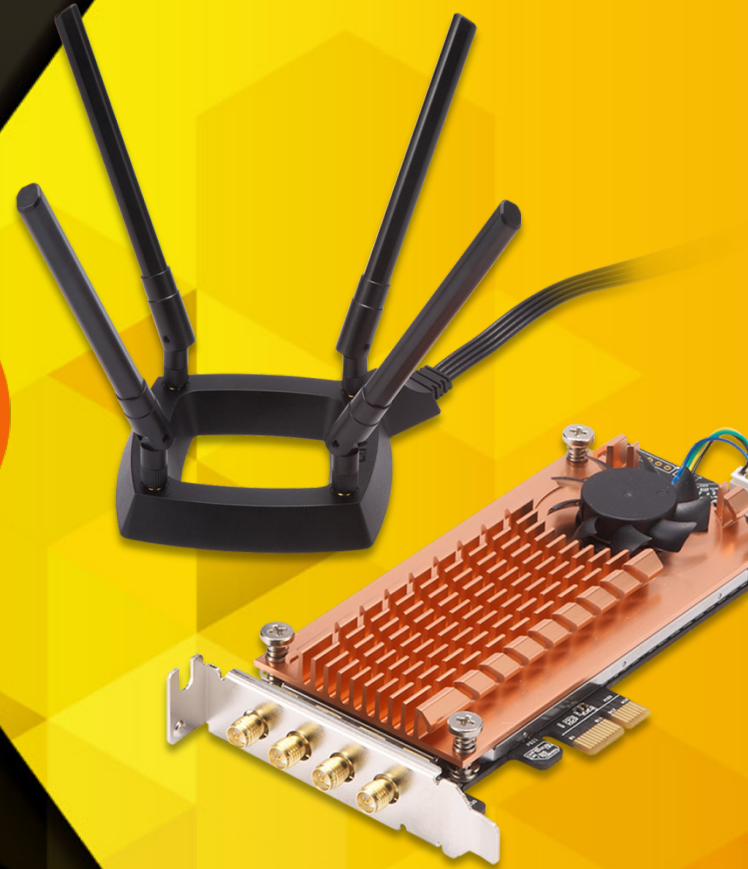
Wireless base station setup

- Ubuntu
- QNAP NAS



QNAP

Ubuntu PC Wireless base station setup



Ubuntu PC system requirement

Ubuntu version : 17.10 or later
Kernel version: 4.13 or later
Driver : ATH10K
(Ubuntu system built-in)



3 step to build a Wireless AP with Ubuntu PC

1



Install Ubuntu
17.10



2



Install QWA-
AC2600



3



Install and setup
AP suite : Hostapd
Client: wpa_supplicant

Install AP Suite

- **AP suite : Hostapd**
 - **command : sudo apt-get install hostapd**
- **Ubuntu default setting will lock the network management function, need to unlock by instruction.**
 - **sudo nmcli radio wifi off**
 - **sudo rfkill unblock all**
- **If need to change network interface card name(or use default name)**
sudo ip link set wlp4s0 name wifiap0
sudo ip link set wlp5s0 name wifiap1

Set up Hostapd #1

1. Create `/etc/hostapd/hostapd_5G.conf` Profile
2. interface set up to `wifiap0`

```
# AP netdevice name (without 'ap' postfix, i.e., wlan0 uses wlan0ap for  
# management frames); ath0 for madwifi  
interface=wifiap0
```

Set up Hostapd #2

3. Set up driver

```
# Driver interface type (hostap/wired/madwifi/test/none/nl80211/bsd);  
# default: hostap). nl80211 is used with all Linux mac80211 drivers.  
# Use driver=none if building hostapd as a standalone RADIUS server  
that does  
# not control any wireless/wired driver.  
driver=nl80211
```

Set up Hostapd #3

4. Set up SSID for Wireless network :

SSID to be used in IEEE 802.11 management frames

`ssid=QNAP-AP`

5. Set up Wireless network operation mode:

Operation mode a(5G)

Default: IEEE 802.11b

`hw_mode=a`

Set up Hostapd #4

6. WPA Setting :

Enable WPA. Setting this variable configures the AP to require WPA

bit0 = WPA

bit1 = IEEE 802.11i/RSN (WPA2) (dot11RSNAEnabled)

wpa=2

Set up Hostapd #5

7. Input password for wireless network :

WPA pre-shared keys for WPA-PSK.

```
wpa_passphrase=QNAP12345
```

8. #Start up hostapd

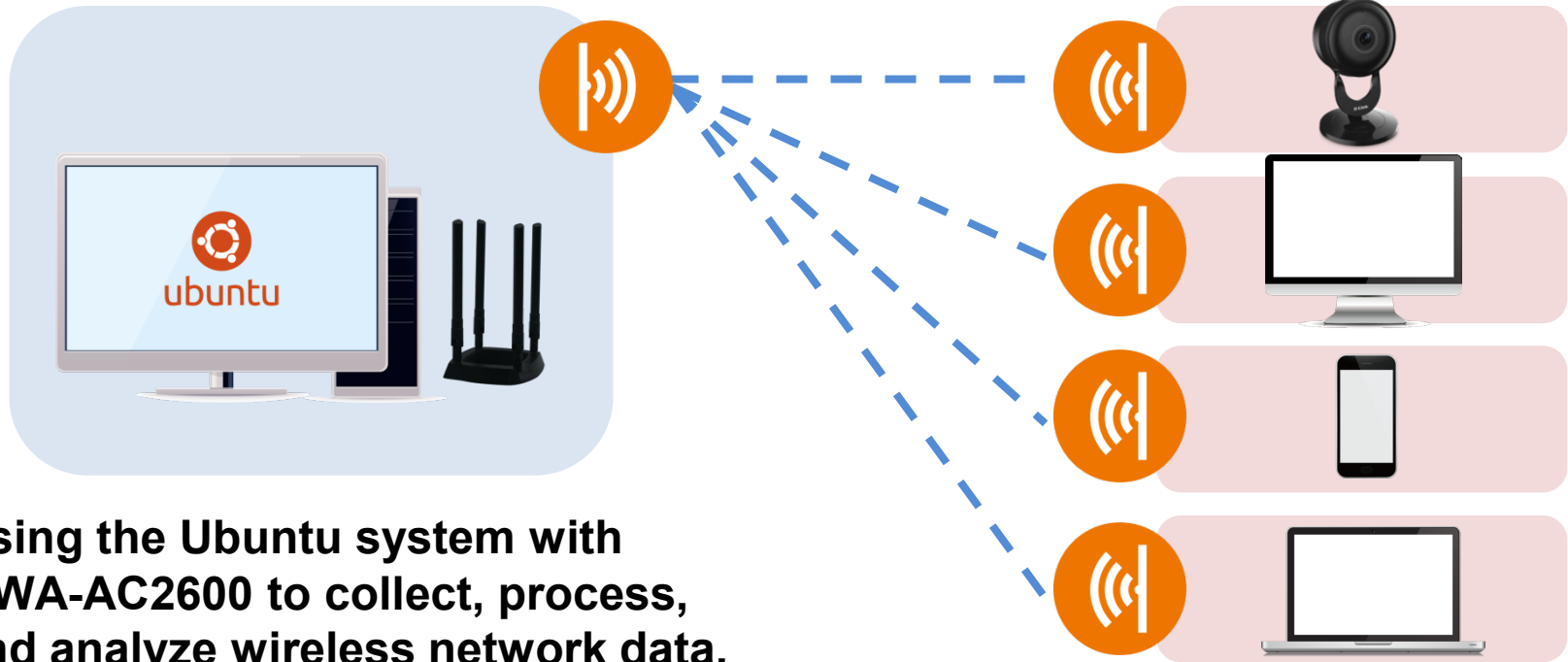
```
sudo /usr/sbin/hostapd -B /etc/hostapd/hostapd_5G.conf  
sudo /usr/sbin/hostapd -B /etc/hostapd/hostapd_2.4G.conf
```

Hostapd detail information

```
interface=wifiap0
driver=nl80211
ssid=QNAP-AP-5G
hw_mode=a
channel=0
preamble=1
auth_algs=3
wpa=2
wpa_key_mgmt=WPA-PSK
rsn_pairwise=CCMP
wpa_passphrase=QNAP12345
wmm_enabled=1
uapsd_advertisement_enabled=1
disassoc_low_ack=1
country_code=TW
```

```
ieee80211d=1
ieee80211n=1
ht_capab=[HT40+][SHORT-GI-20][SHORT-GI-40][LDPC][TX-STBC][RX-STBC1][DSSS_CCK-40][MAX-AMSDU-7935]
ieee80211ac=1
vht_capab=[MAX-MPDU-11454][RXLDPC][VHT160-80PLUS80][SHORT-GI-80][SHORT-GI-160][TX-STBC-2BY1][RX-STBC-1][SU-BEAMFORMER][SU-BEAMFORMEE][MU-BEAMFORMER][BF-ANTENNA-2][BF-ANTENNA-3][SOUNDING-DIMENSION-2][SOUNDING-DIMENSION-3][MAX-A-MPDU-LEN-EXP7][RX-ANTENNA-PATTERN][TX-ANTENNA-PATTERN]
vht_oper_chwidth=1
vht_oper_centr_freq_seg0_idx=0
vht_oper_centr_freq_seg1_idx=0
```

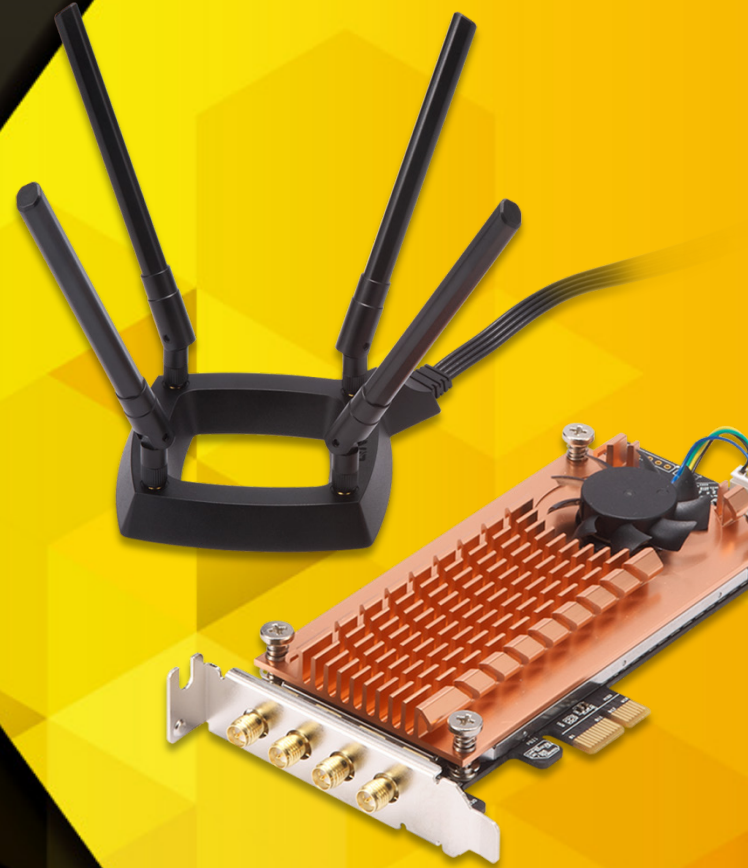
Private ubuntu wireless network architecture



Using the Ubuntu system with QWA-AC2600 to collect, process, and analyze wireless network data.

QNAP

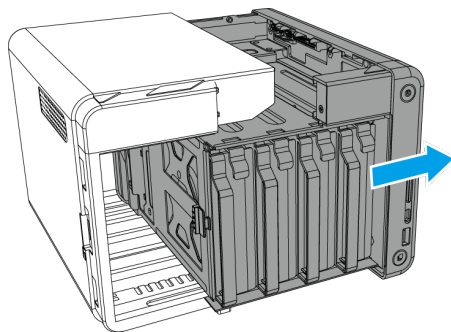
QNAP NAS Wireless base station setup



Installation of QWA-AC2600

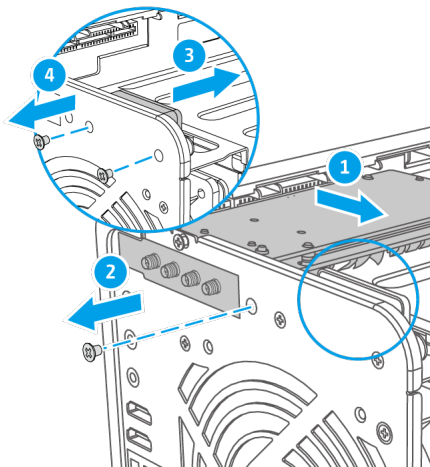
1

Remove the cover
of TS-453Be



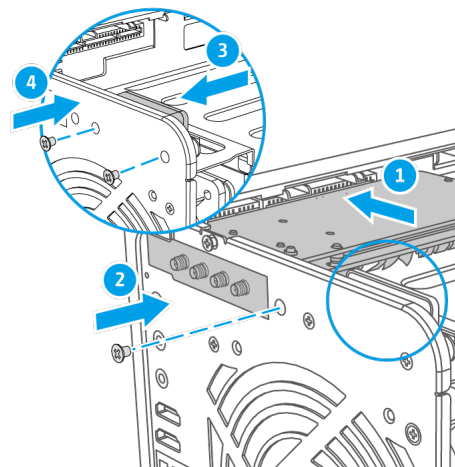
2

Remove the PCIe cover



3

Install QWA-AC2600



NOTE 1 : Some model may require its speaker to be temporary removed to install QWA-AC2600

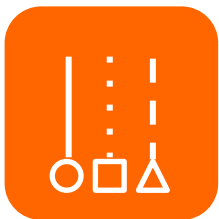
NOTE 2 : Bracket exchange of QWA-AC2600 is required to install it in the some model

Install WirelessAP Station suite

Exclusive wireless Network bandwidth Application suite for NAS



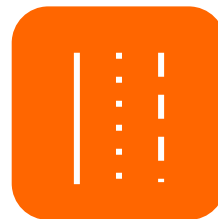
Directly connect to the
NAS with a wireless
network



Scalable physical AP –
add several access
points with multiple
expansion cards



Set up separate wireless
connection interfaces
(such as IoT/VM/Container)
as needed



Enjoy network
optimization with
traffic shunting

Set up separate wireless connection interfaces

Now you can freely set up independent, secure wireless connection interface



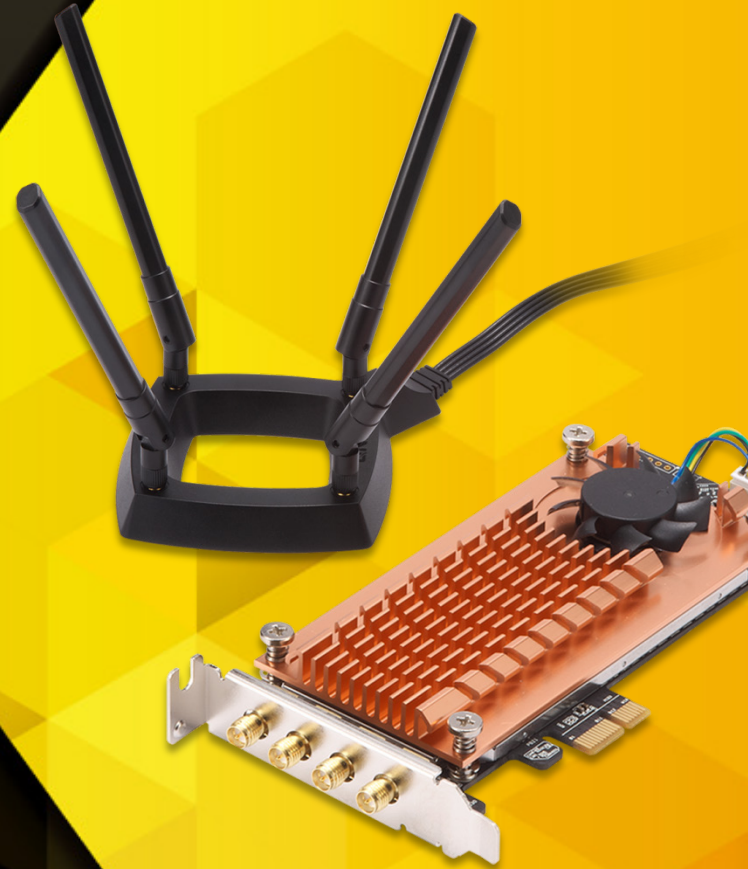
QWA-AC2600



QNAP

4

Application introduction



Setting of QWA-AC2600

Normal application
QNAP NAS wireless AP



Advance application
private network
environment(Router)



3 Step convert a QNAP NAS into an AP



Download and install WirelessAP Station form QTS App Center

1

Click “Add Access Point”



WirelessAP Station

Add Access Point

Overview



Overview

Status

2

Select QWA-AC2600



Add Access Point



Select an NIC



Configure



Summary

Select an NIC

Select the NIC that you want to use as an access point (AP).

3

Configure the Access Point

Configure Access Point

Model : QWA-AC2600

Display Name : TL-Network

SSID : myWireless

Password : myPassword

Frequency : 2.4G

Install Wireless AP Station suite

The screenshot displays the QNAP App Center interface. On the left is a sidebar menu with categories like 'My Apps', 'All Apps', 'QTS Essentials', 'Recommended', 'Partners', 'Backup/ Sync', 'Business', 'Content Management', 'Communications', 'Developer Tools', 'Download', 'Entertainment', 'Surveillance', 'Utilities', 'Home Automation', and 'Security'. The main area shows a grid of application cards. The 'WirelessAP Station 1.0.0' app is highlighted with a red border. A blue callout box with white text is overlaid on the right side of the grid, pointing to the highlighted app.

Install and Open WirelessAP Station form App Center

| App Name | Version | Category | Action |
|----------------------|----------|---------------|-----------|
| Qsirch | 3.3.0 | Utilities | + Install |
| Qsync Central | 3.0.3 | Backup/ Sync | Open |
| QVPN Service | 1.1.172 | Utilities | + Install |
| Surveillance | | Surveillance | + Install |
| Surveillance | | Surveillance | + Install |
| Resource Monitor | 1.0.0 | Utilities | Open |
| Surveillance Station | | Surveillance | + Install |
| Text Editor | 1.0.1 | Utilities | + Install |
| Linux Station | 1.5.1935 | Utilities | + Install |
| Video Station | 5.3.0 | Entertainment | + Install |
| WirelessAP Station | 1.0.0 | Utilities | Open |

Add Access Point

WirelessAP Station

WirelessAP Station

Add Access Point Overview

Overview

Access Points

Settings

Logs

Click “Add Access Point” to select and configure a network interface card (NIC) as an access point

No access points available. Click Add Access Point to select and configure an NIC.

Select an NIC

The screenshot shows the 'WirelessAP Station' interface with the 'Add Access Point' wizard open. The current step is 'Select an NIC', which includes a dropdown menu for selecting a network interface card. The first option, 'QW-AC2600-5G (12:34:56:78:90:12)', is highlighted and circled in red. A red hexagon with the number '1' is placed to the left of the dropdown. Below the dropdown, there are two numbered instructions: 1. Ensure that the network card is properly installed on the NAS. 2. Verify that your network interface card is supported by your QNAP NAS. To see the compatibility list, go to <https://www.qnap.com/compatibility/>. At the bottom of the wizard, there are 'Cancel' and 'Next' buttons. The 'Next' button is circled in red, and a red hexagon with the number '2' is placed to its left.

WirelessAP Station

WirelessAP Station

Add Access Point

Select an NIC Configure Summary

Select an NIC

Select the NIC that you want to use as an access point (AP).

1 QW-AC2600-5G (12:34:56:78:90:12)

QW-AC2600-5G (12:34:56:78:90:12)

QW-AC2600-2.4G (00:03:7f:12:34:56)

1. Ensure that the network card is properly installed on the NAS.

2. Verify that your network interface card is supported by your QNAP NAS. To see the compatibility list, go to <https://www.qnap.com/compatibility/>

Cancel

2 Next

Select the NIC that you want to use as an access point

**QWA-AC2600 support
5G/2.4G dual IC**

Configure Access Point

The screenshot displays the 'Configure Access Point' window in the QNAP WirelessAP Station web interface. The window title is 'WirelessAP Station' and the page title is 'Add Access Point'. The navigation bar shows three steps: 'Select an NIC', 'Configure', and 'Summary'. The 'Configure' step is currently active. The configuration form includes the following fields:

- Model : QW-AC2600
- Display name : QW-AC2600-5G
- SSID : WirelessAP5G
- Password : 12345678
- Frequency : 5G

At the bottom of the form, there are 'Cancel' and 'Next' buttons. A red hexagonal callout with the number '1' is positioned over the 'Configure' step in the navigation bar. Another red hexagonal callout with the number '2' is positioned over the 'Next' button. A dark blue banner on the right side of the screen contains the text 'Setting SSID and Password'.

Configure Access Point

The screenshot shows the 'WirelessAP Station' web interface. On the left is a dark sidebar with navigation options: 'Add Access Point', 'Overview', 'Access Points', 'Settings', and 'Logs'. The main content area is titled 'Overview' and contains a table of access points. The first row in the table has a status of 'Activating', which is highlighted with a red rectangular box. The second row has a status of 'Active'. A blue callout box with red text is overlaid on the right side of the table, stating 'Waiting the Status turn to Active'.

| Status | Display name | SSID | Action |
|------------|--------------|--------------|-------------------------------------|
| Activating | QW-AC2600-5G | WirelessAP5G | <input type="checkbox"/> |
| Active | QW-AC2600-5G | WirelessAP5G | <input checked="" type="checkbox"/> |

Editing an Access Point Profile

WirelessAP Station

WirelessAP Station

Add Access Point

Overview

Access Points

QW-AC2600-5G

Settings

Logs

QW-AC2600-5G

Display name : QW-AC2600-5G

Model : QW-AC2600

Status : Active

SSID : WirelessAP5G

Encryption type : WPA2 (Recommended)

Password : 12345678

Frequency : 5G

Channel : Auto

Connection details :

1 device(s) are connecting to this access point

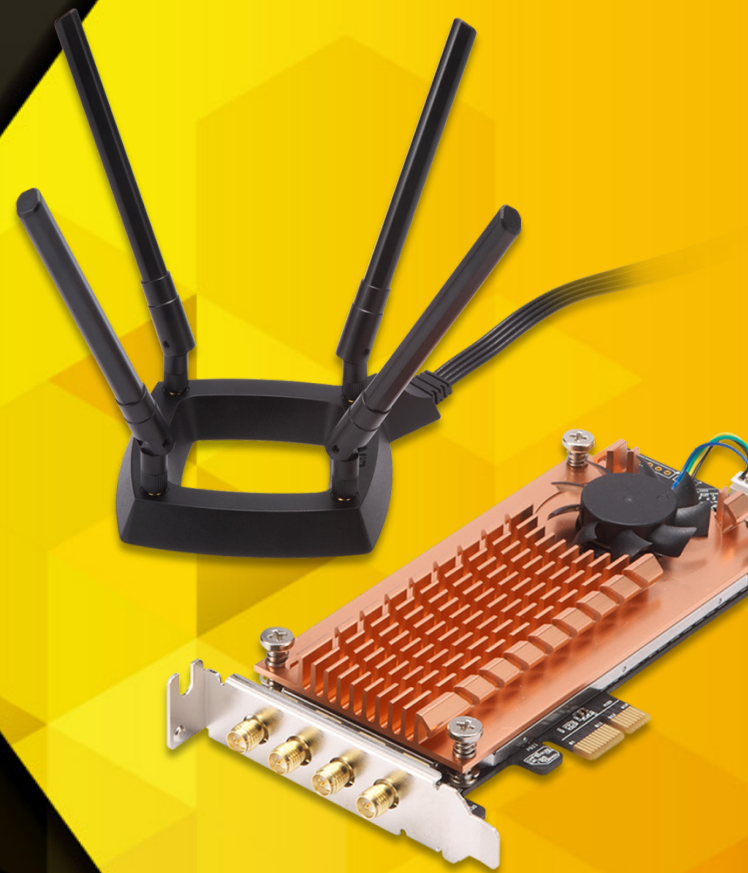
| No. | MAC | Uploaded | Downloaded | Duration | Signal Quality | IP |
|-----|-------------------|----------|------------|----------|----------------|--------------|
| 1 | 40.cb.c0:20:c0:44 | 531.46KB | 2.67MB | 12s | | 192.168.1.22 |

Save Cancel Delete

- ✓ Check and modify Wireless AP setting
- ✓ Review the connection details

QNAP

DEMO



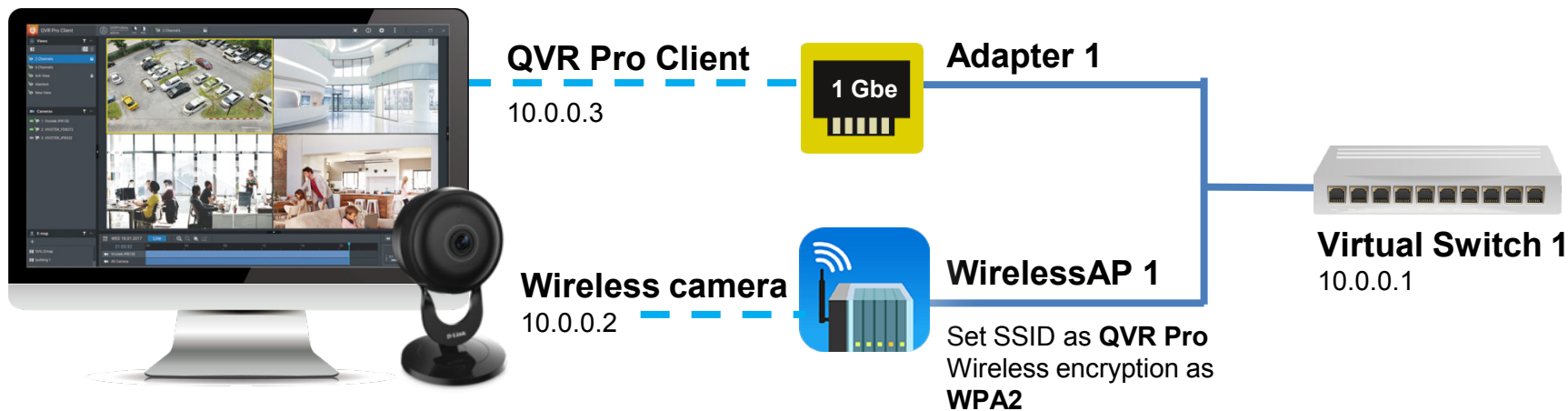
Advance: Private Surveillance

Connect wireless cameras to the network provided by WirelessAP Station and build a secure and professional surveillance system with QVR Pro



Enable DHCP & NAT services to a secure surveillance environment

Create a Virtual Switch to a private network by QTS "Network and Virtual Switch" function

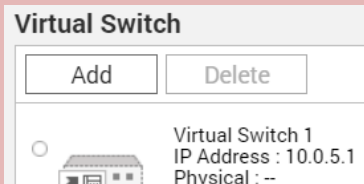


6 step to set up secure wireless connection interface

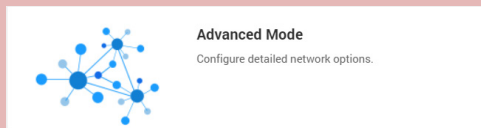


Open Network & Virtual Switch form QTS

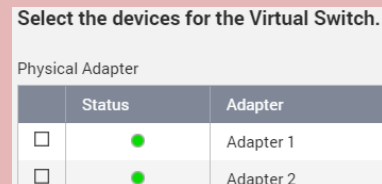
1 Click 「Add」



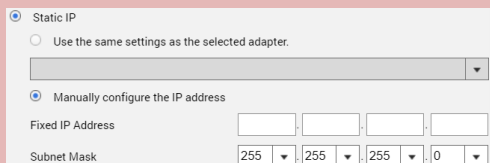
2 Select Advanced Mode



3 Select the devices for the Virtual Switch



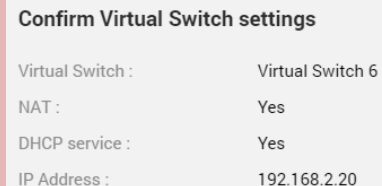
4 Set up the Virtual Switch IP address



5 Set up the Virtual Switch service



6 Confirm Virtual Switch settings



Open Network & Virtual Switch form Control Panel

The image shows a screenshot of the QNAP Control Panel interface. At the top, there is a navigation bar with a search icon, system status icons (volume, network, power), a notification bell with '10+', and a user profile for 'admin'. Below the navigation bar, a row of application icons is displayed: Control Panel (highlighted with a red box and a red hexagon containing the number '1'), File Station, myQNAPcloud, App Center, Help Center, and Qsync Central. A blue callout box is overlaid on the screen, showing a zoomed-in view of the Control Panel window. Inside this window, the 'Control Panel' title bar is visible, along with system information: TVS-682, Firmware version: 4.3.4.0537 Build 20180331, CPU: Intel(R) Core(TM) i3-7100 CPU @ 3.90GHz, and Memory: 8 GB (7944.1 MB usable). The main content area is divided into sections: System, Privilege, and Network & File Services. The 'Network & File Services' section is expanded, and the 'Network & Virtual Switch' icon is highlighted with a red box and a red hexagon containing the number '2'. Other icons in this section include Network Access, Win/Mac/NFS, Telnet / SSH, SNMP, Service Discovery, and FTP. A 'more>>' link is visible to the right of the 'Security' and 'External Device' icons in the System section.

Select Advanced Mode

The screenshot displays the 'Network & Virtual Switch' configuration interface. On the left sidebar, the 'Interfaces' tab is selected and highlighted with a red box and a red hexagon containing the number '1'. At the bottom left, the 'Advanced' button is highlighted with a red box and a red hexagon containing the number '2'. The main content area shows a network diagram with the following components:

- Adapter 1:** IP address 172.17.46.84, with 69.6 KB of data received and 17.5 KB of data sent.
- Adapter 2:** A standard network adapter icon.
- WirelessAP 2:** SSID: WirelessAP2.4G, Security: WPA2, Password: 12345678.
- WirelessAP 1:** SSID: WirelessAP5G, Security: WPA2, Password: 12345678.
- Virtual Switch 3:** IP address 192.168.1.20, with associated DHCP Server and NAT services.

Green lines in the diagram indicate connections between Adapter 1 and Adapter 2, and between Adapter 2 and the Virtual Switch 3. A red globe icon is also visible in the top right corner of the main area.

Create a Virtual Switch

The screenshot displays the 'Network & Virtual Switch' management interface. On the left, a sidebar contains navigation options: Overview, Interfaces, Virtual Switch, DHCP Server, and System Default Gateway. The 'Virtual Switch' section is active, showing a list of existing virtual switches with columns for IP Address, Physical Adapter, and Member. A red hexagon with the number '1' highlights the 'Add' button in the top right of this section.

A modal dialog box titled 'Create a Virtual Switch' is open in the center. It prompts the user to 'Please select a mode'. Two options are presented: 'Basic Mode' and 'Advanced Mode'. 'Basic Mode' is described as a 'standard bridge' for connecting devices. 'Advanced Mode' is described as allowing for 'detailed network options'. A red hexagon with the number '2' highlights the 'Advanced Mode' option. A dark blue callout box with white text points to this option, stating 'Select Advanced Mode'. The 'Close' button is visible at the bottom right of the dialog.

At the bottom of the interface, there are two tabs: 'Basic' and 'Advanced'. The 'Advanced' tab is currently selected and highlighted in blue.

Select the devices for the Virtual Switch

Create a Virtual Switch

Select the devices for the Virtual Switch.

| Adapter | Status | Adapter | |
|--------------------------|--------|--------------|---------------------|
| <input type="checkbox"/> | ● | Adapter 1 | 172.17.46.84 |
| <input type="checkbox"/> | ● | Adapter 2 | 192.168.1.20 (Vi... |
| <input type="checkbox"/> | ○ | Adapter 3 | -- |
| <input type="checkbox"/> | ○ | Adapter 4 | -- |
| <input type="checkbox"/> | ● | WirelessAP 1 | 192.168.1.20 (Vi... |
| <input type="checkbox"/> | ● | WirelessAP 2 | 192.168.1.20 (Vi... |

Enable the Spanning Tree Protocol to prevent bridge loops.

Cancel Step 1/4 Next

Choose physical adapter for the Virtual Switch

Set up the Virtual Switch IP address

Manually configure the IP address

Set up the Virtual Switch IP address

1 DHCP client i

Static IP

Use the same settings as the selected adapter.

Manually configure the IP address

Fixed IP Address

Subnet Mask

Default Gateway

Do not assign IP addresses (for special purposes such as building an external network or isolated network)

Cancel Step 2/4 **2**

Enable NAT and DHCP Server

1

Set up the Virtual Switch service

- Enable NAT
- Enable DHCP Server

Start IP address

192 . 168

End IP address

192 . 168 . 1 . 250

Subnet Mask

255 . 255 . 255 . 0

Lease time

1 Day(s) 0 Hour(s)

Default Gateway

192 . 168 . 1 . 20

DNS Server

8 . 8 . 8 . 8

WINS Server

DNS suffix

Cancel

Step 3/4

Prev

2

Next

Set up IP address and DNS server

Confirm setting and Apply

Confirm Virtual Switch settings

| | |
|------------------|---------------------------------------|
| Virtual Switch : | Virtual Switch 3 |
| NAT : | Yes |
| DHCP service : | Yes |
| IP Address : | 192.168.1.20 |
| Submask : | 255.255.255.0 |
| Gateway : | -- |
| Member : | Network & Virtual Switch |
| Adapter : | Adapter 2, WirelessAP 1, WirelessAP 2 |
| DNS Server : | 10.8.2.11 |
| DHCP Start : | 192.168.1.21 |
| DHCP End : | 192.168.1.250 |
| DHCP Lease : | 1Day(s) |

Check the setting

Cancel

Step 4/4

Previous

Apply

Setting completed

Network & Virtual Switch

Network & Virtual Switch

Overview

Interfaces

Virtual Switch

DHCP Server

System Default Gateway

Adapter 1
172.17.46.84
19.6 KB 4.9 KB

Adapter 2

WirelessAP 2
SSID: WirelessAP2.4G
Security: WPA2
Password: 12345678

WirelessAP 1
SSID: WirelessAP5G
Security: WPA2
Password: 12345678

Virtual Switch 3
192.168.1.20

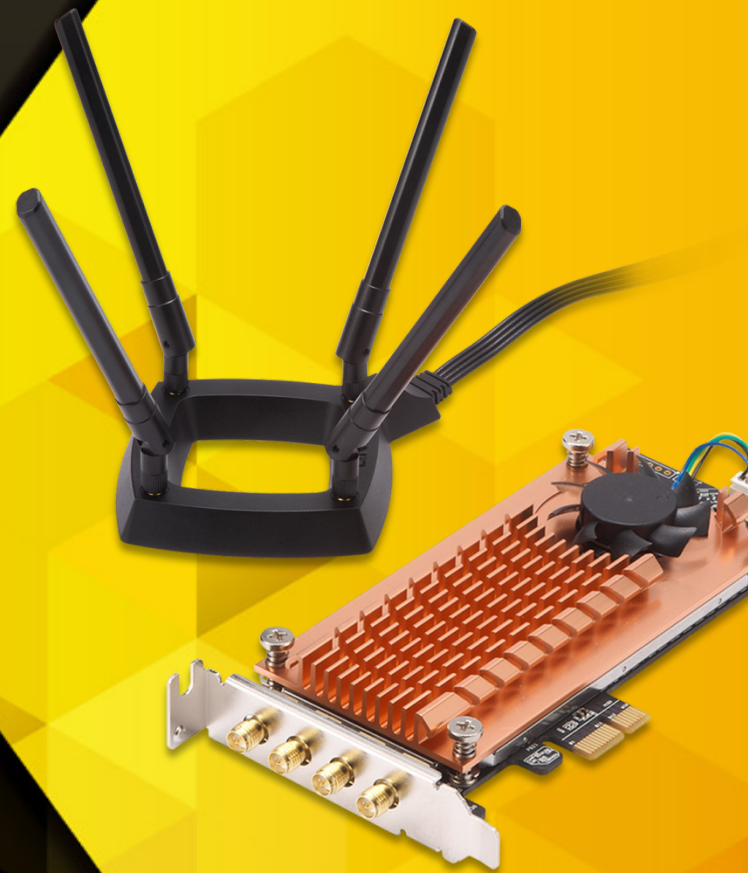
DHCP Server

NAT

Basic Advanced

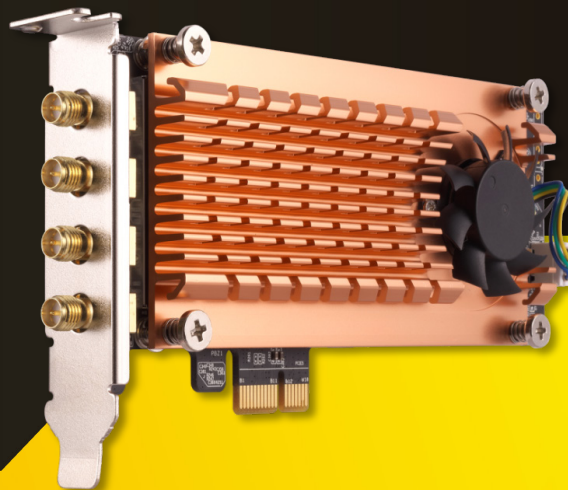
QNAP

DEMO



QNAP

Made for Ubuntu PC and QNAP NAS



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