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

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

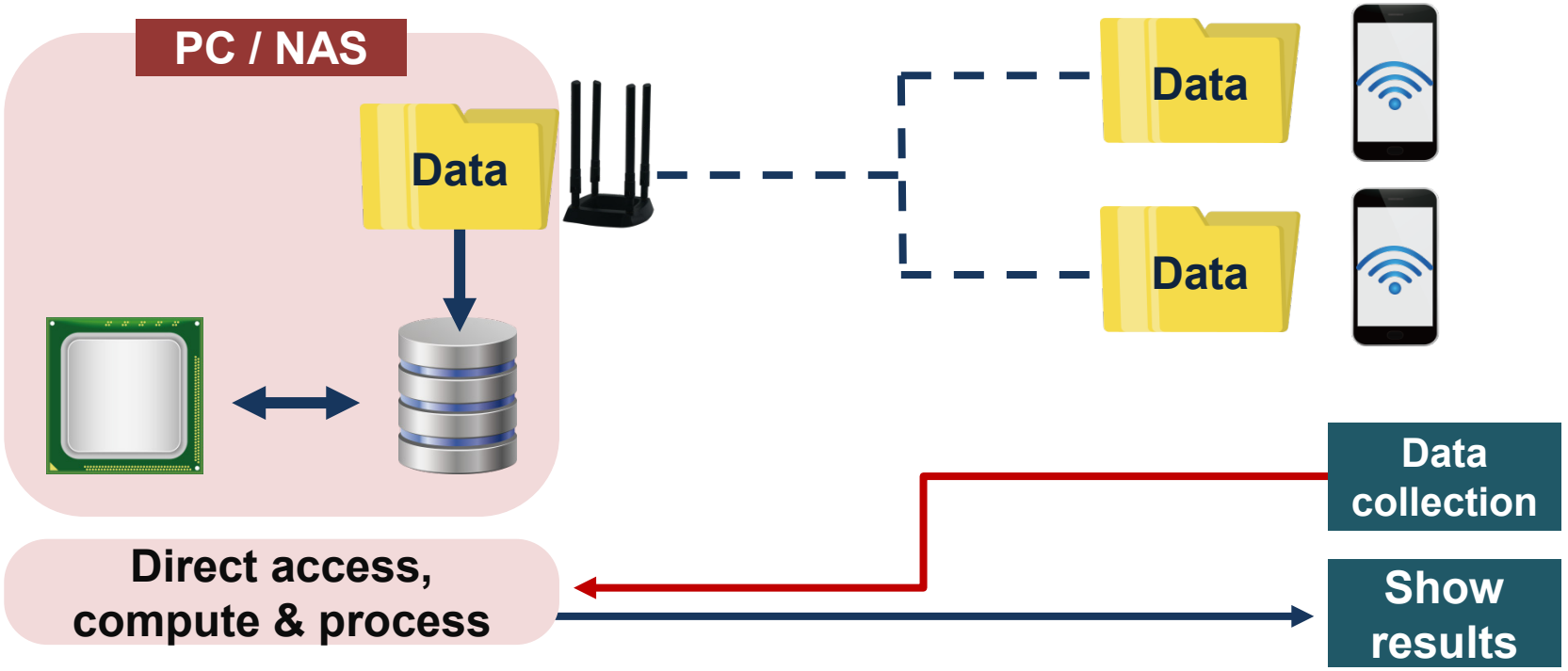
Good news for DIY maker

Build your own wireless network base station

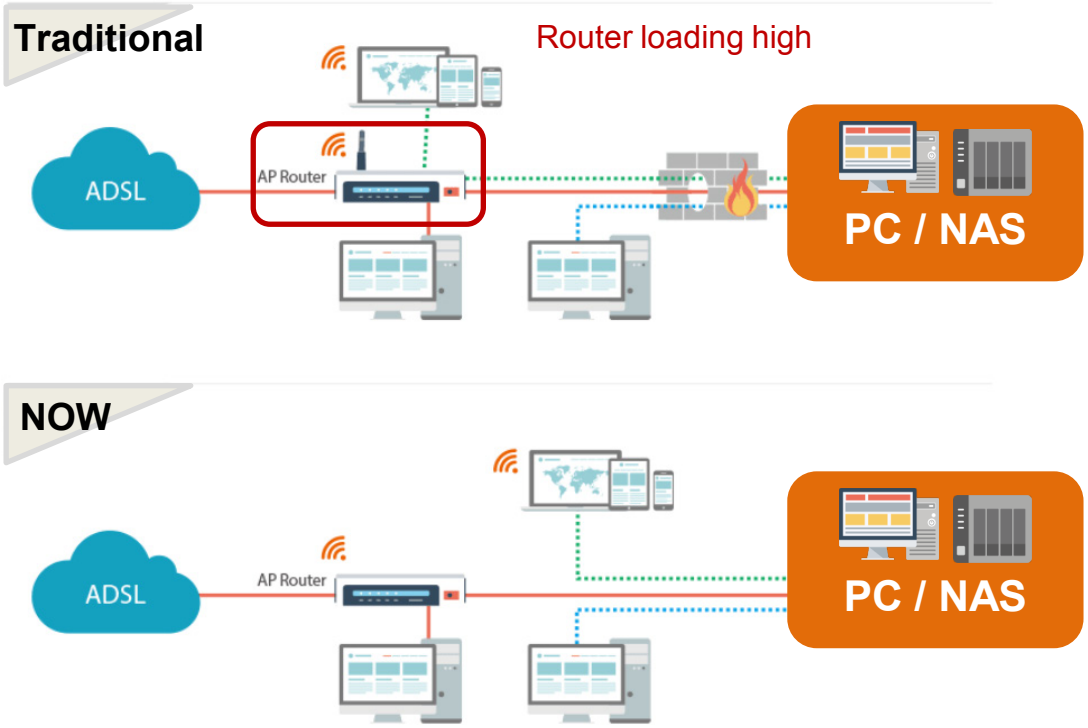
Ubuntu system

QWA-AC2600

Wireless edge computing



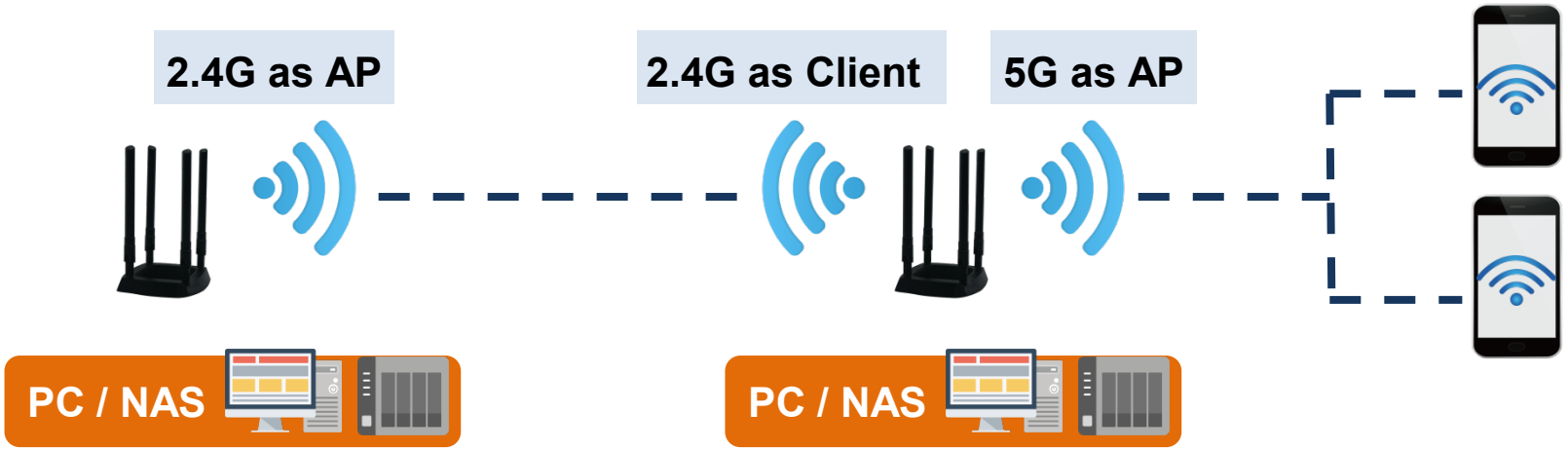
Enjoy network optimization with traffic shunting



Separate NAS traffic to avoid busy routers slowing down the network

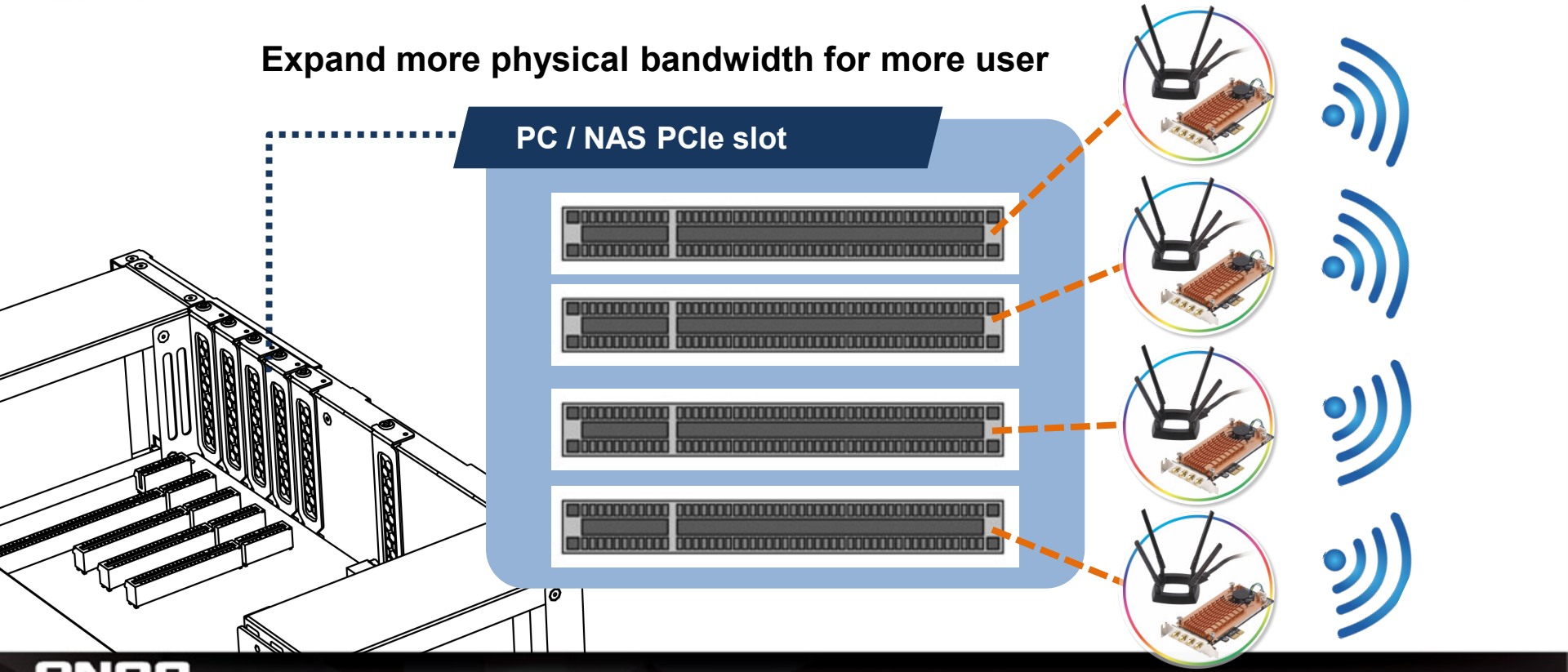
Set up a flexible wireless environment

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

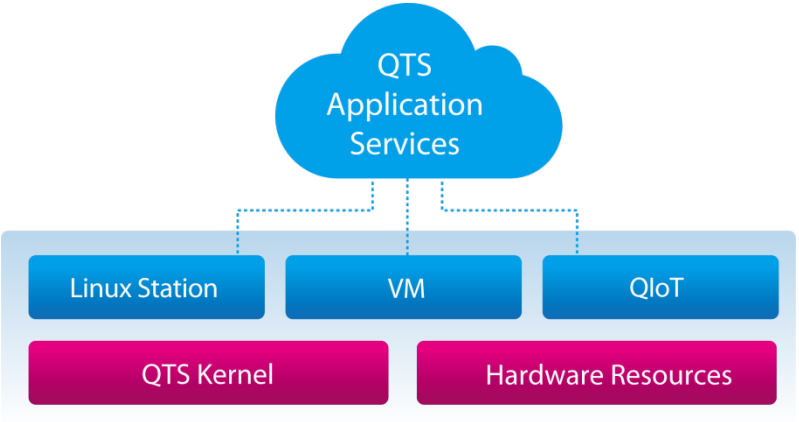
- TS-x53B/x53Be, TS-x53BU
- TVS-x63, TS-x63U
- TVS-x73/x73e, TS-x73U
- TS-x77
- TVS-x82/x82T, TVS-1582TU



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.



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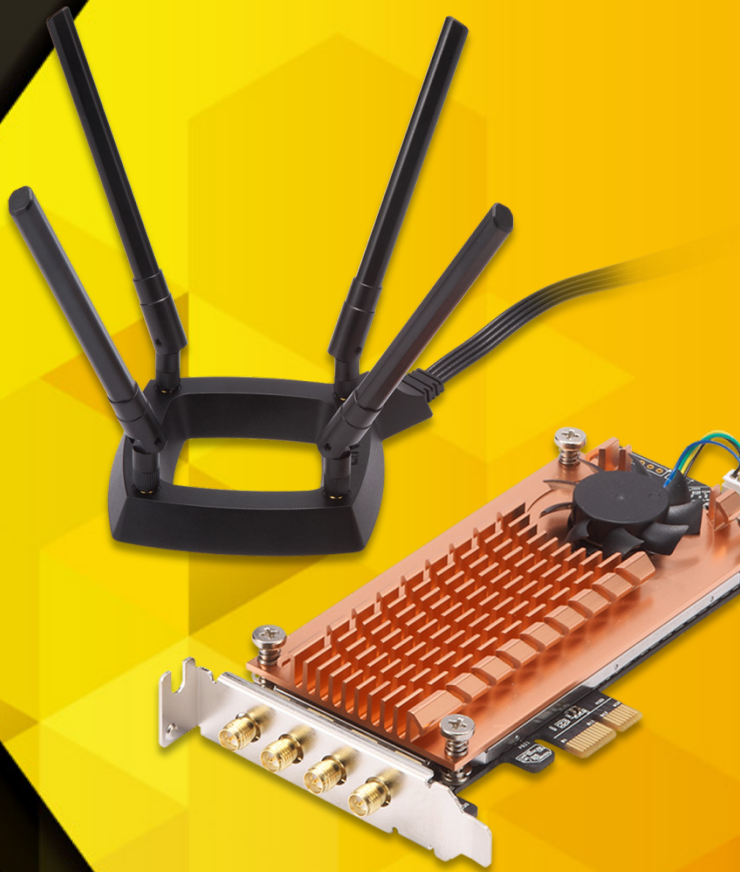
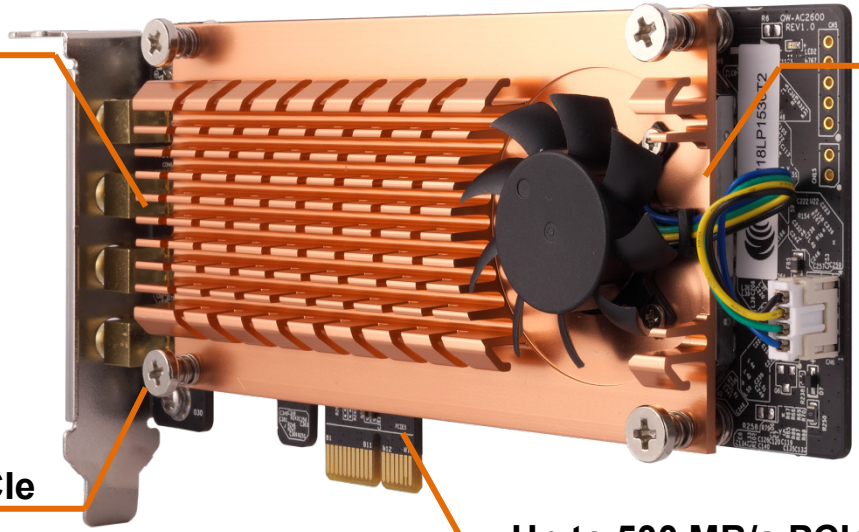
2 QWA-AC 2600 introduction



QWA-AC2600 PCIe wireless NIC

4 X Detachable RP-SMA connector

For extending to Quad-antenna magnetic base



Active cooling module to ensure the transmission quality

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

Low profile PCIe

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

Up to 500 MB/s PCIe bandwidth

With a PCIe 2.0 x1 interface

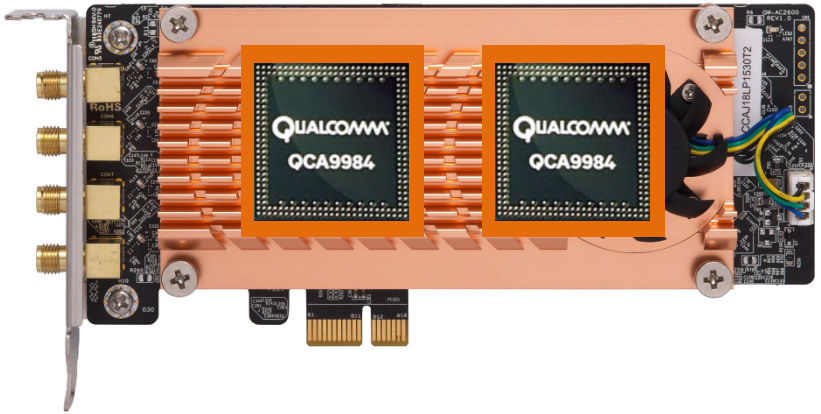
5 GHz and 2.4 GHz dual band

Dual Qualcomm QCA9984 support Dual Band Dual Concurrent

Up to 2600 Mbps total bandwidth

802.11ac (5GHz): up to 1733 Mbps

802.11n (2.4GHz): up to 800 Mbps



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

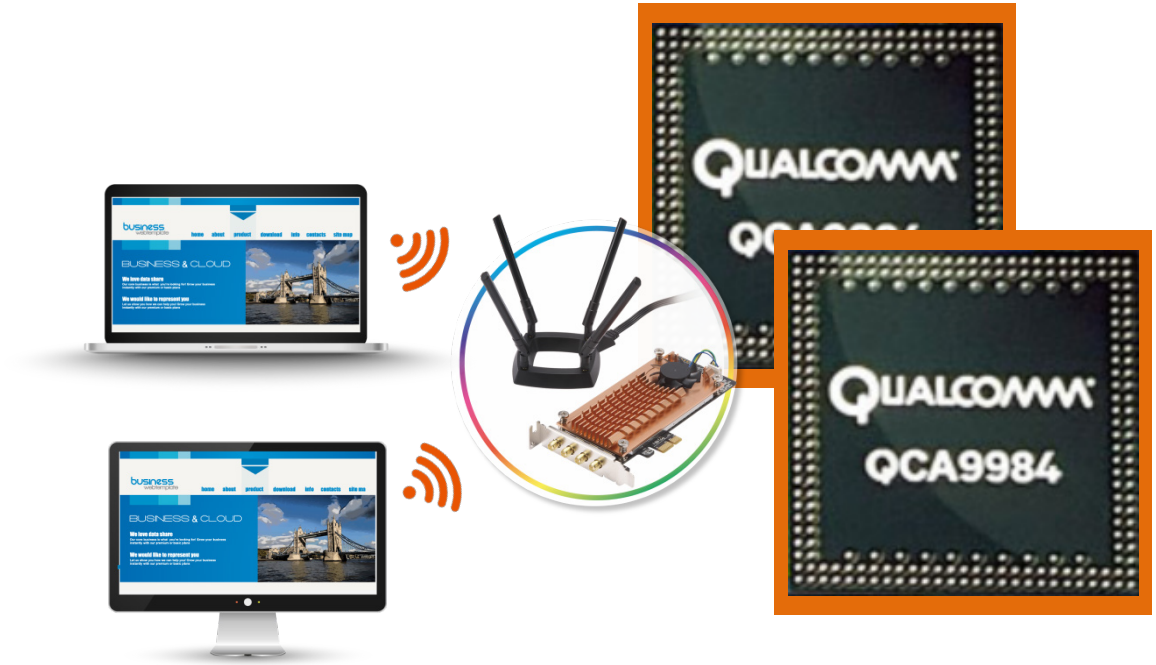
Magnetic

Attached to metal surfaces

2 Qualcomm QCA9984 wireless NIC

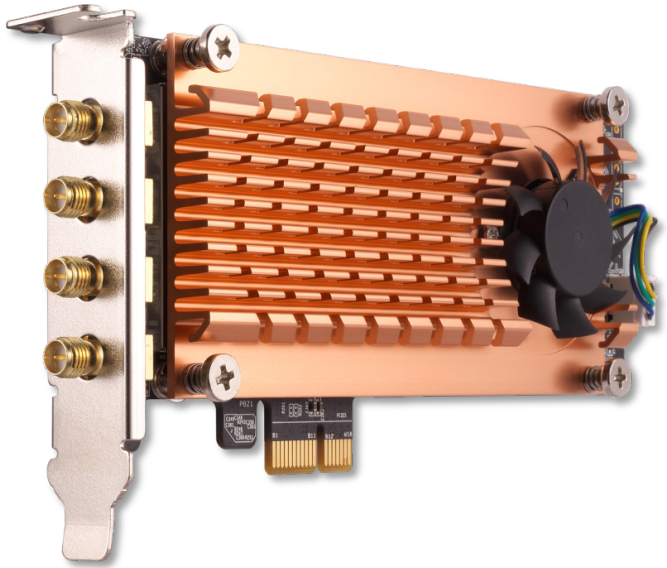
4 x 4 MU-MIMO

- 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

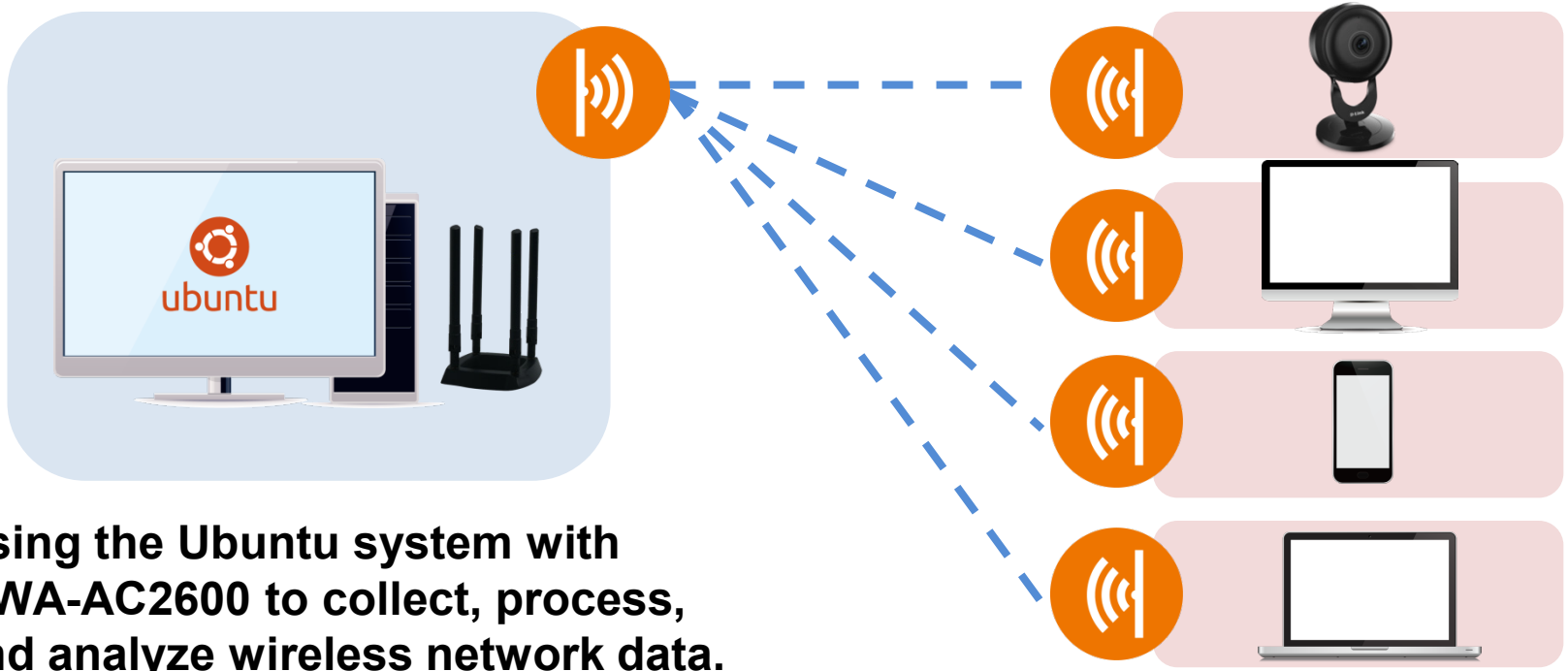
sudo /usr/sbin/hostapd -B /etc/hostapd/hostapd_5G.conf
sudo /usr/sbin/hostapd -B /etc/hostapd/hostapd_2.4G.conf

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-LE
N-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.

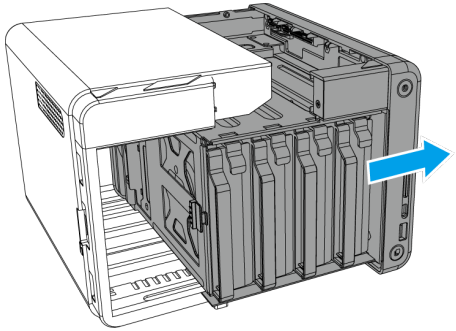
QNAP

QNAP NAS Wireless base station setup

Installation of QWA-AC2600

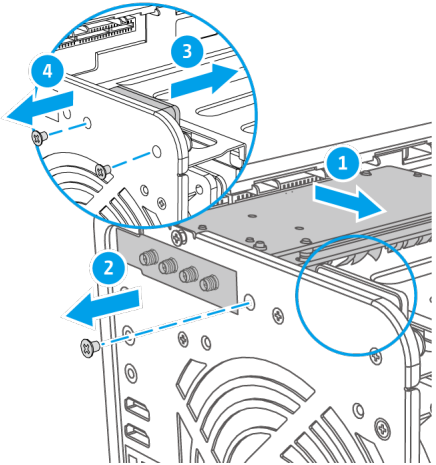
1

Remove the cover of TS-453Be



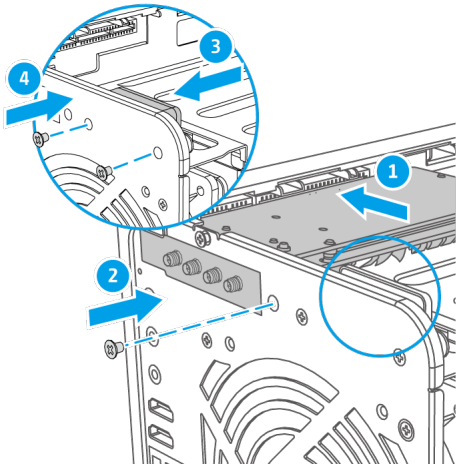
2

Remove the PCIe cover



3

Install QWA-AC2600



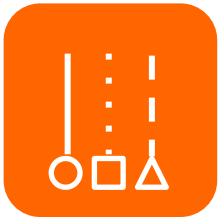
NOTE 1：Some model may require its speaker to be temporary removed to install QWA-AC2600

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

4 Application introduction

Setting of QWA-AC2600

Normal application
QNAP NAS wireless AP

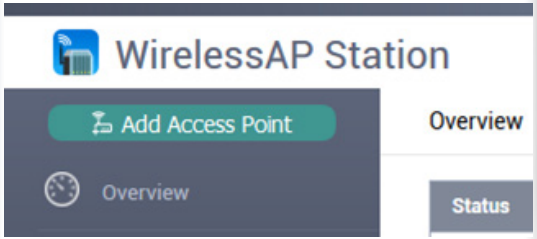
Advance application
private network
environment(Router)

3 Step convert a QNAP NAS into an AP

Download and install WirelessAP Station form QTS App Center

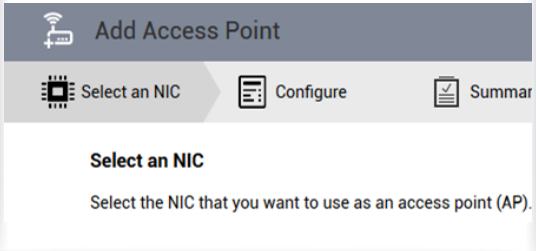
1

Click “Add Access Point”



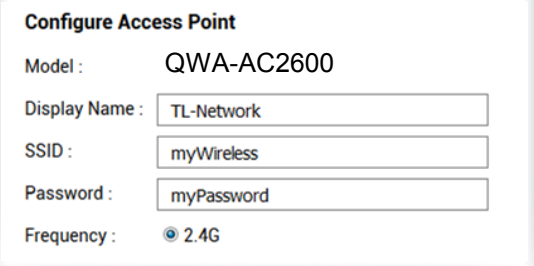
2

Select QWA-AC2600

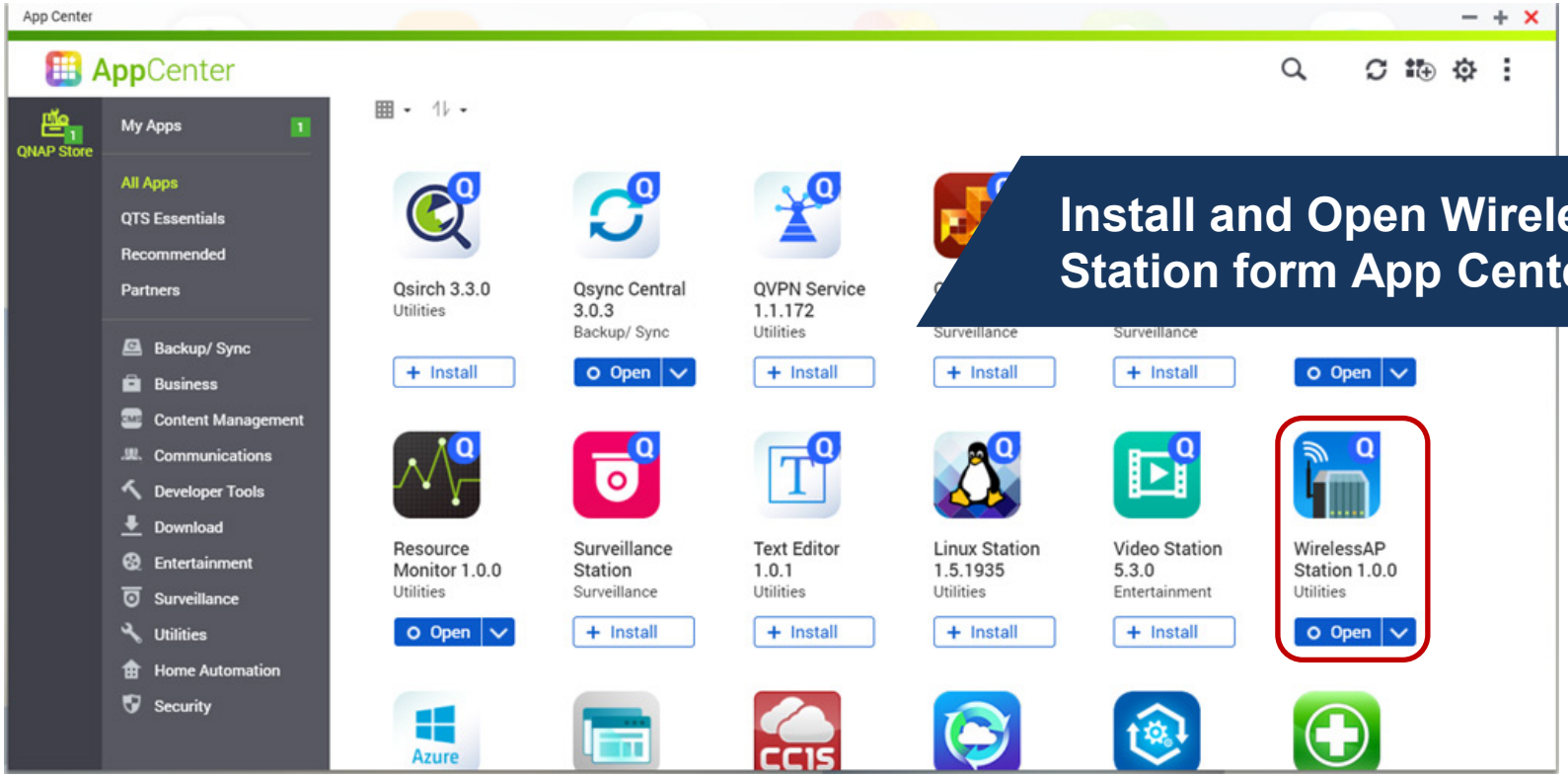


3

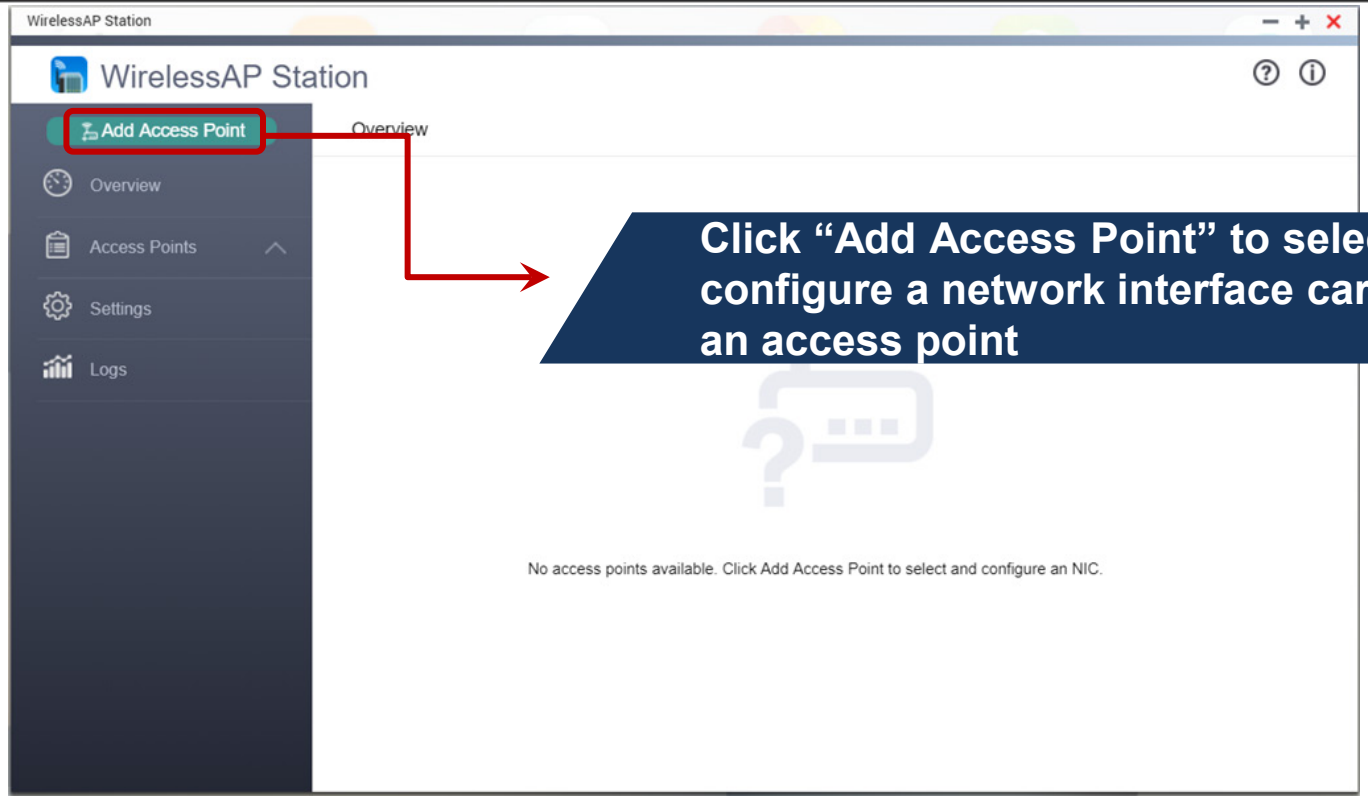
Configure the Access Point



Install Wireless AP Station suite

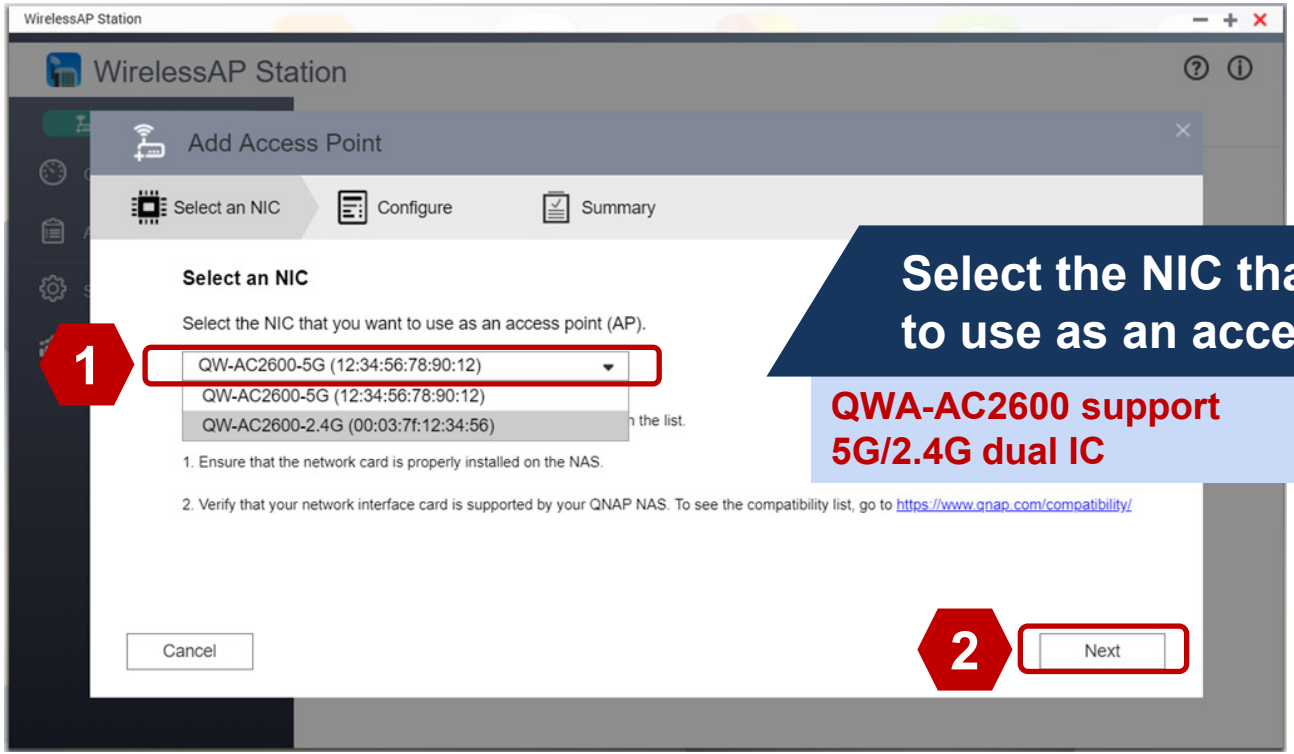


Add Access Point

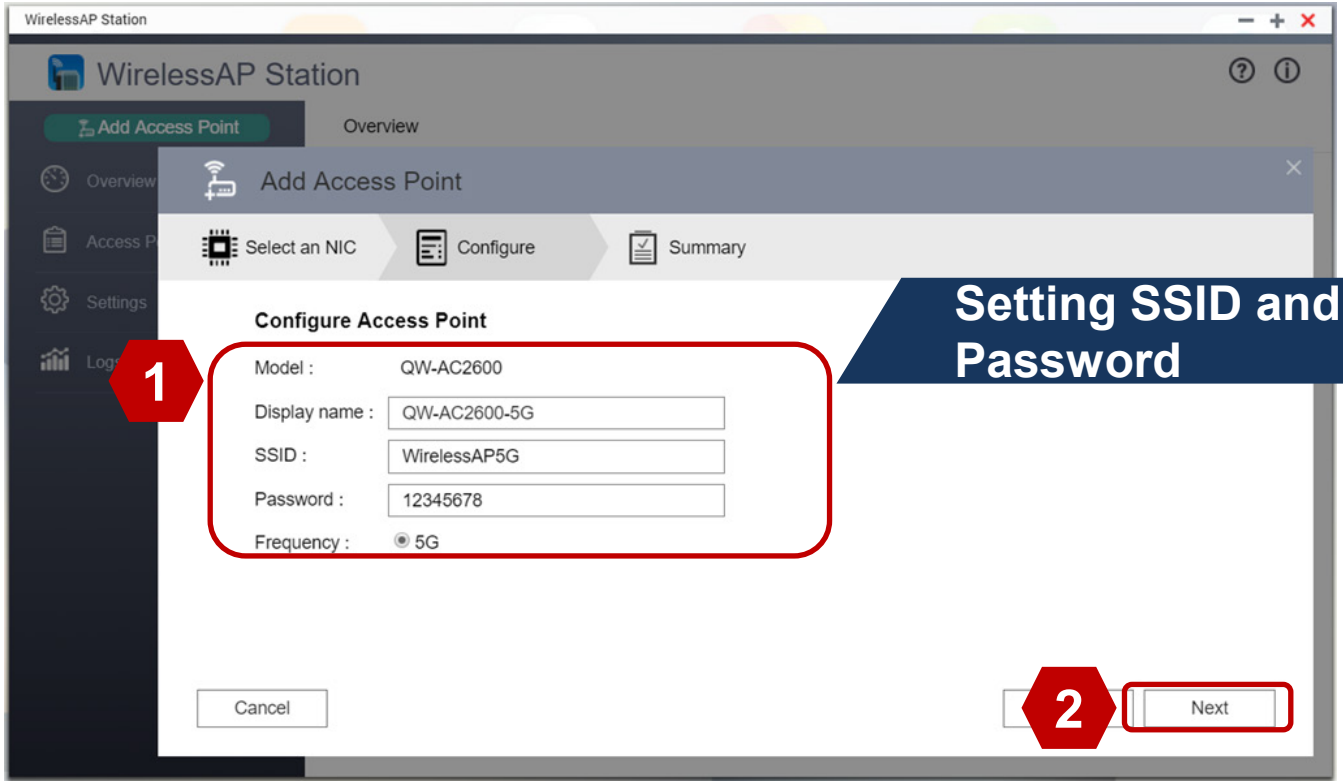


Click “Add Access Point” to select and configure a network interface card (NIC) as an access point

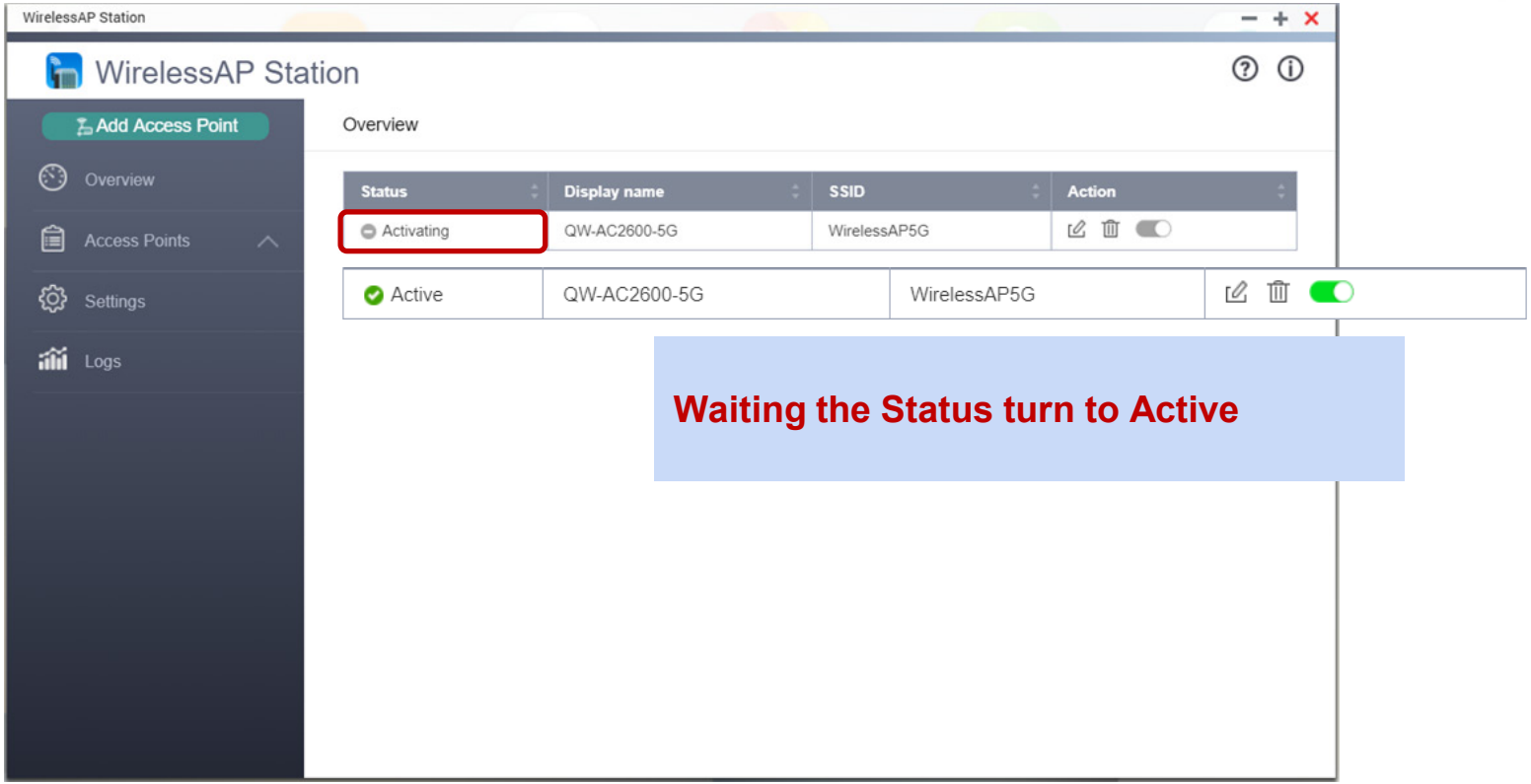
Select an NIC



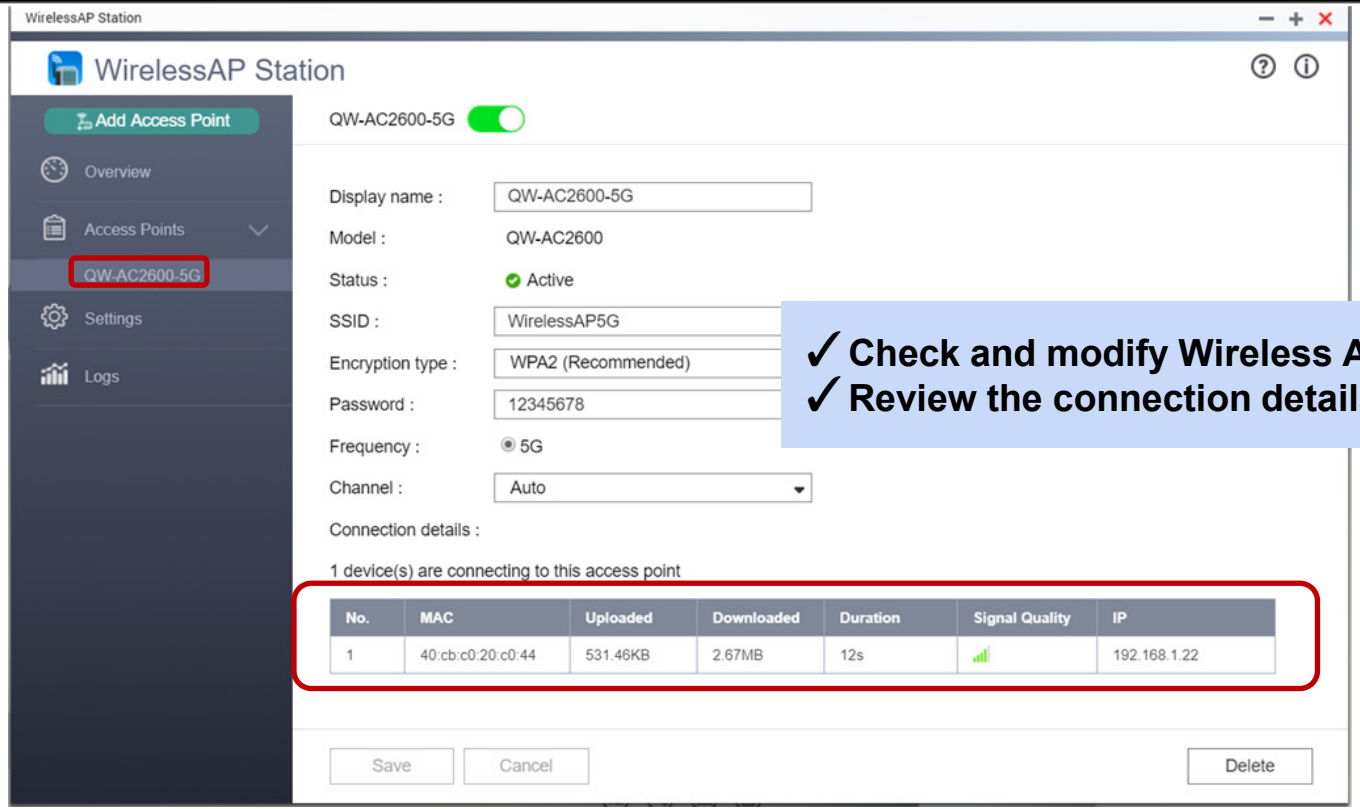
Configure Access Point



Configure Access Point



Editing an Access Point Profile



✓ 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

QVR Pro Client
10.0.0.3

Adapter 1

Wireless camera
10.0.0.2

WirelessAP 1

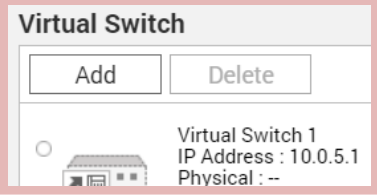
Set SSID as **QVR Pro**
Wireless encryption as **WPA2**

Virtual Switch 1
10.0.0.1

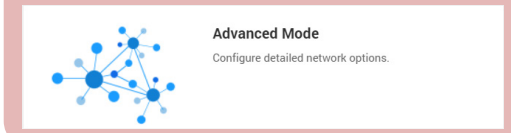
6 step to set up secure wireless connection interface

Open Network & Virtual Switch form QTS

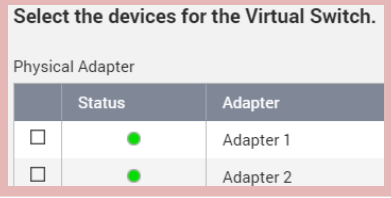
1 Click「Add」



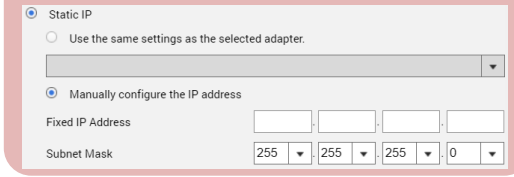
2 Select Advanced Mode



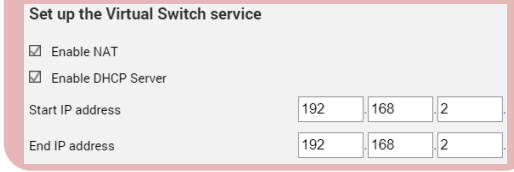
3 Select the devices for the Virtual Switch



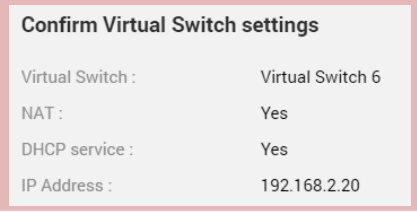
4 Set up the Virtual Switch IP address



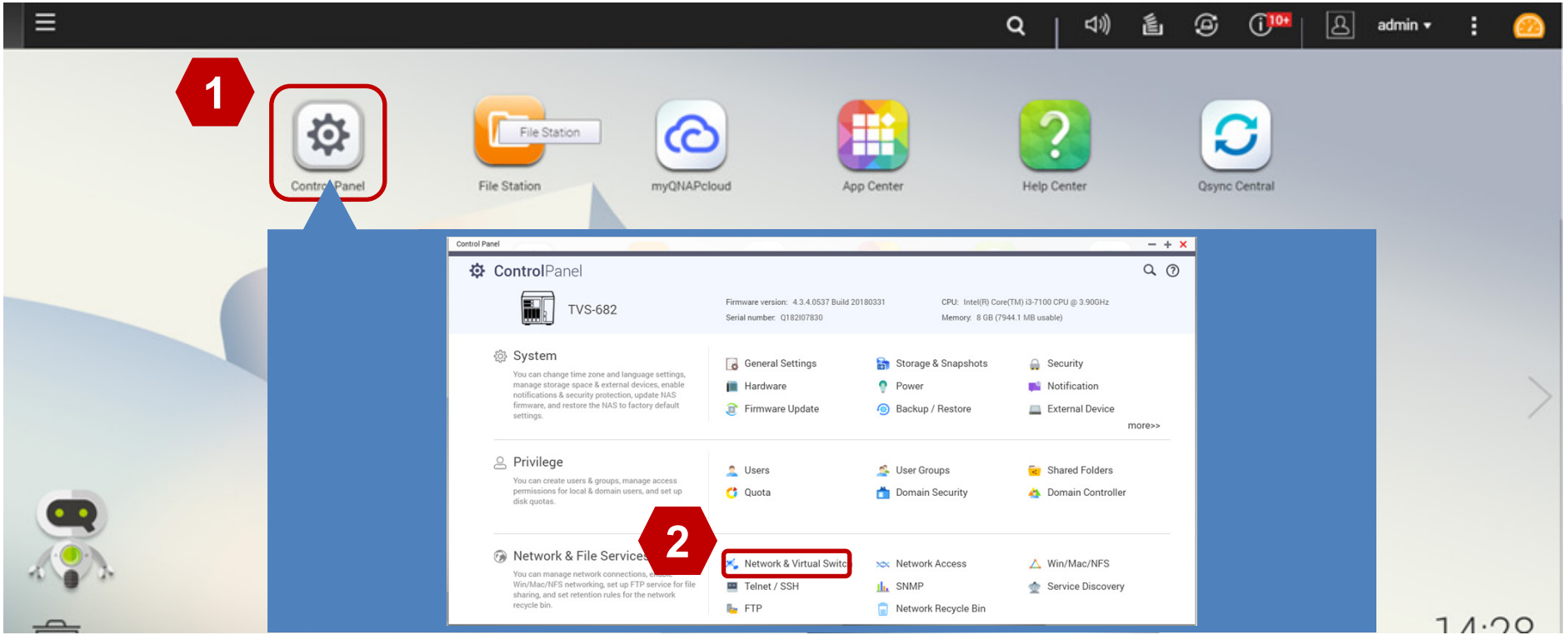
5 Set up the Virtual Switch service



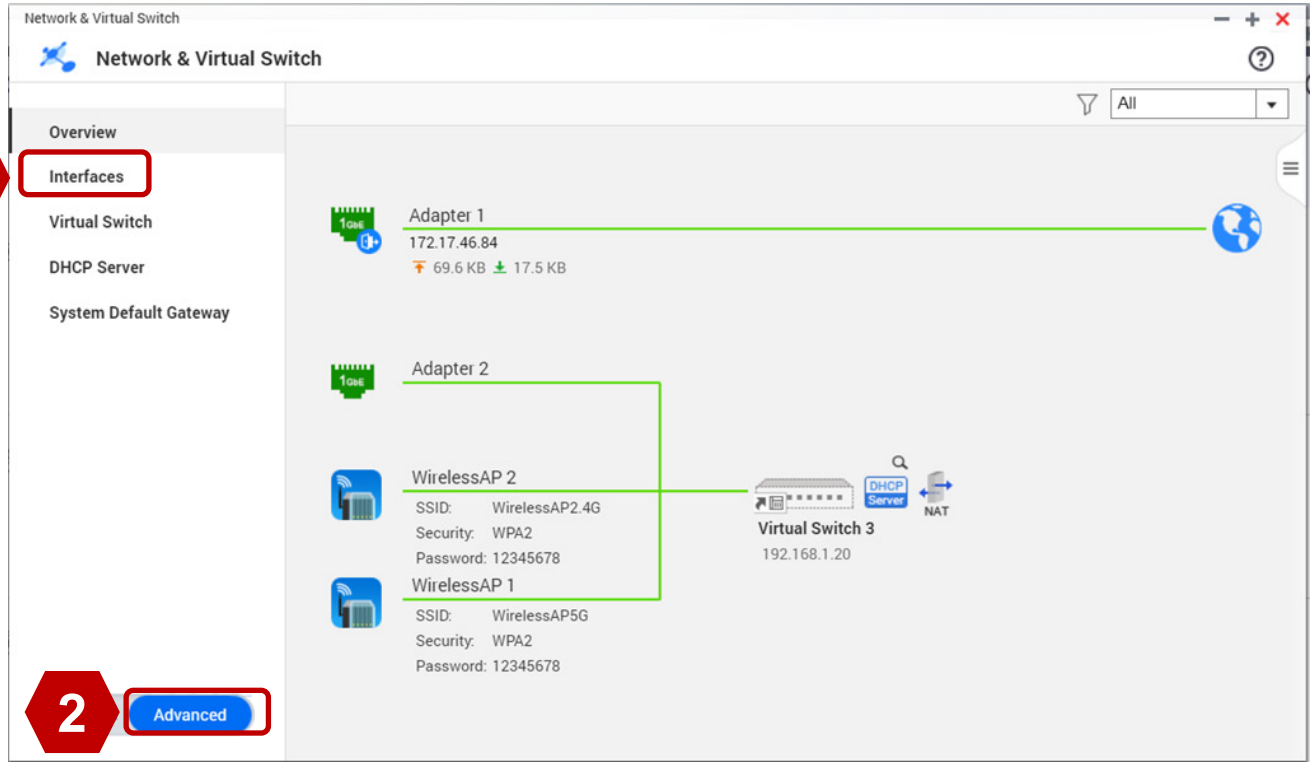
6 Confirm Virtual Switch settings



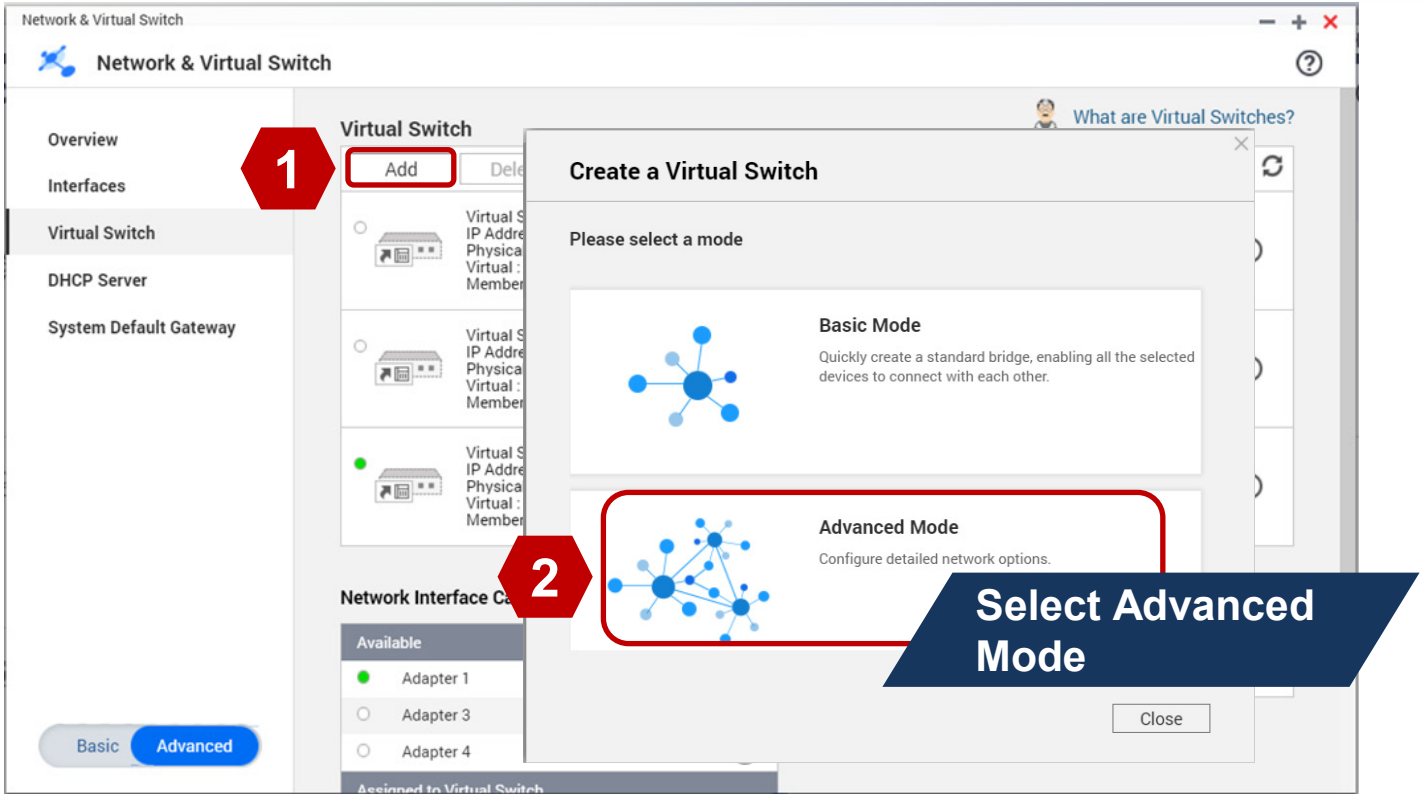
Open Network & Virtual Switch form Control Panel



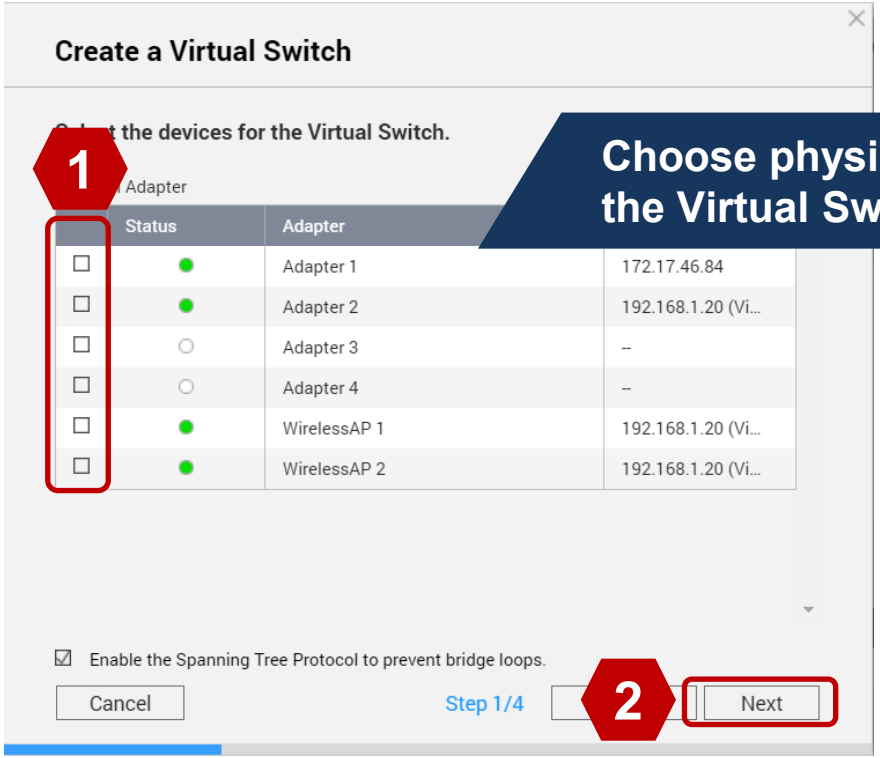
Select Advanced Mode



Create a Virtual Switch

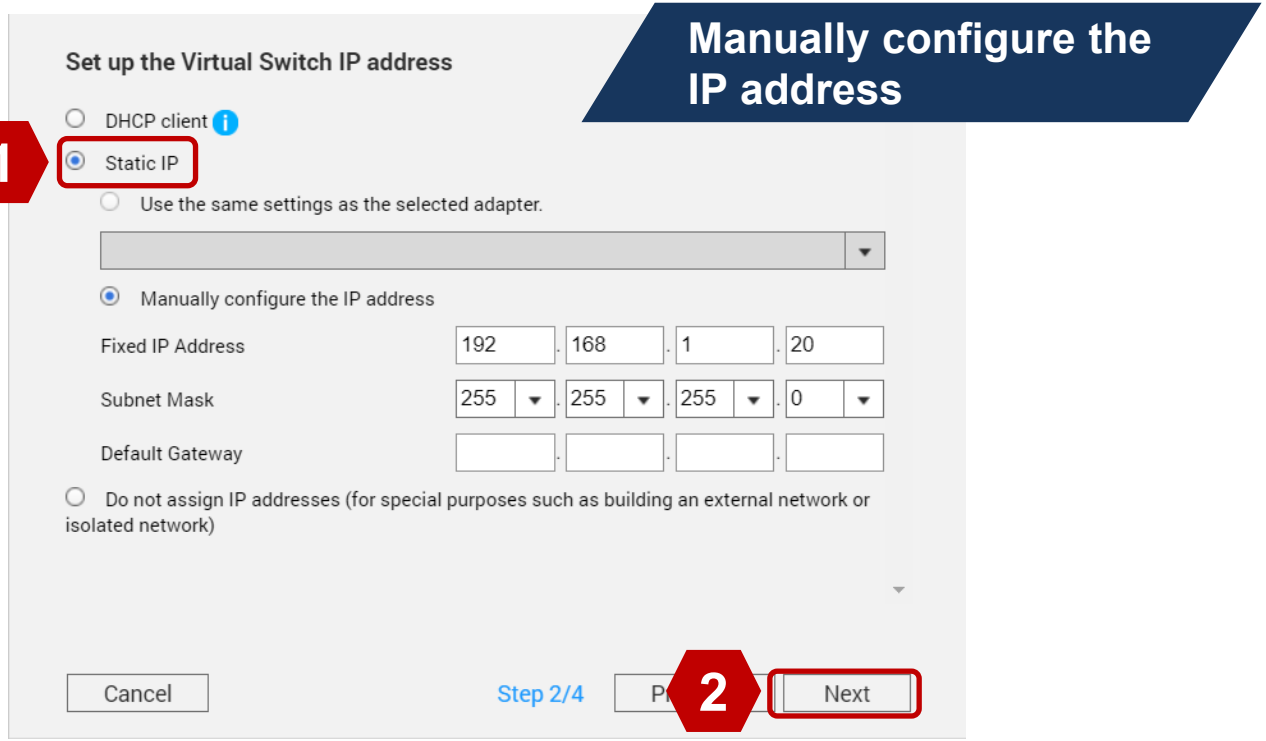


Select the devices for the Virtual Switch

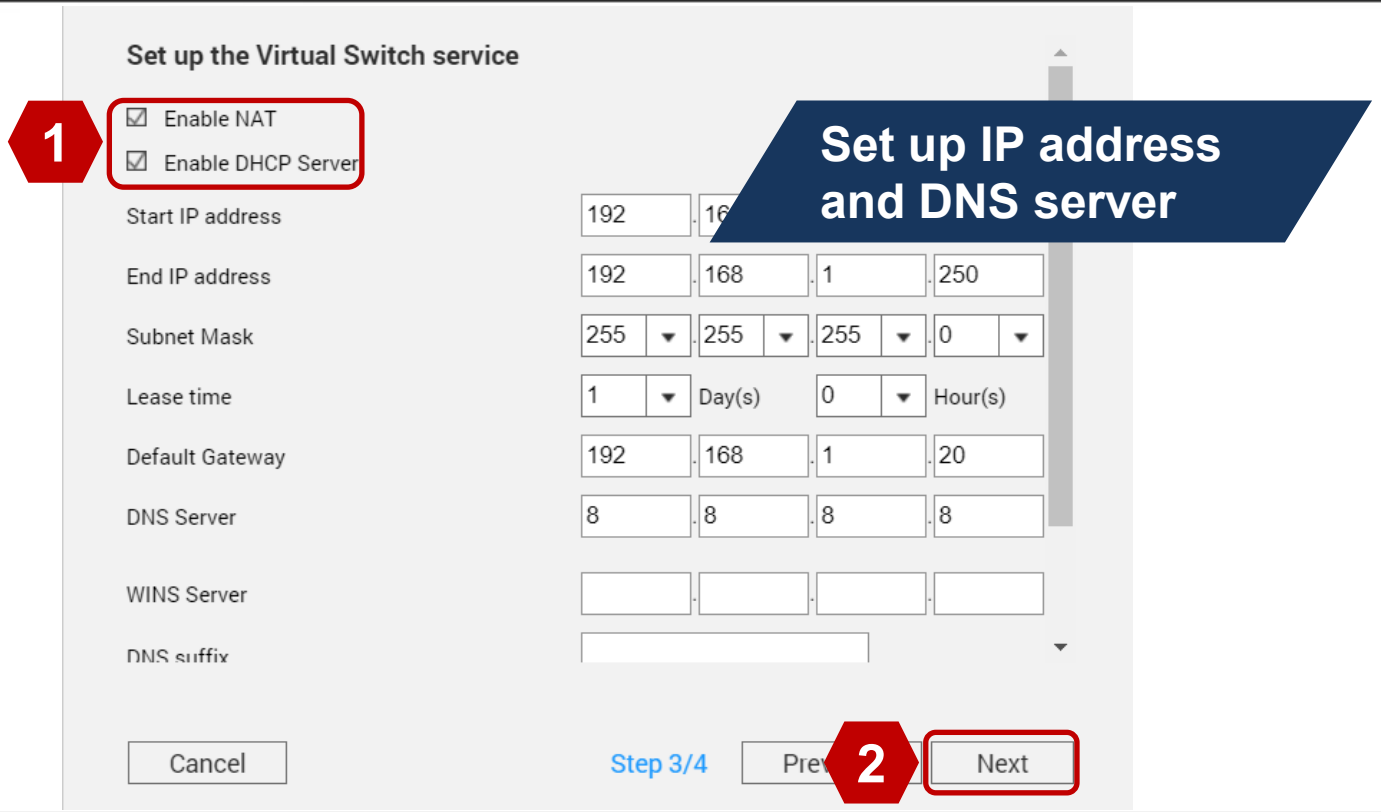


Choose physical adapter for the Virtual Switch

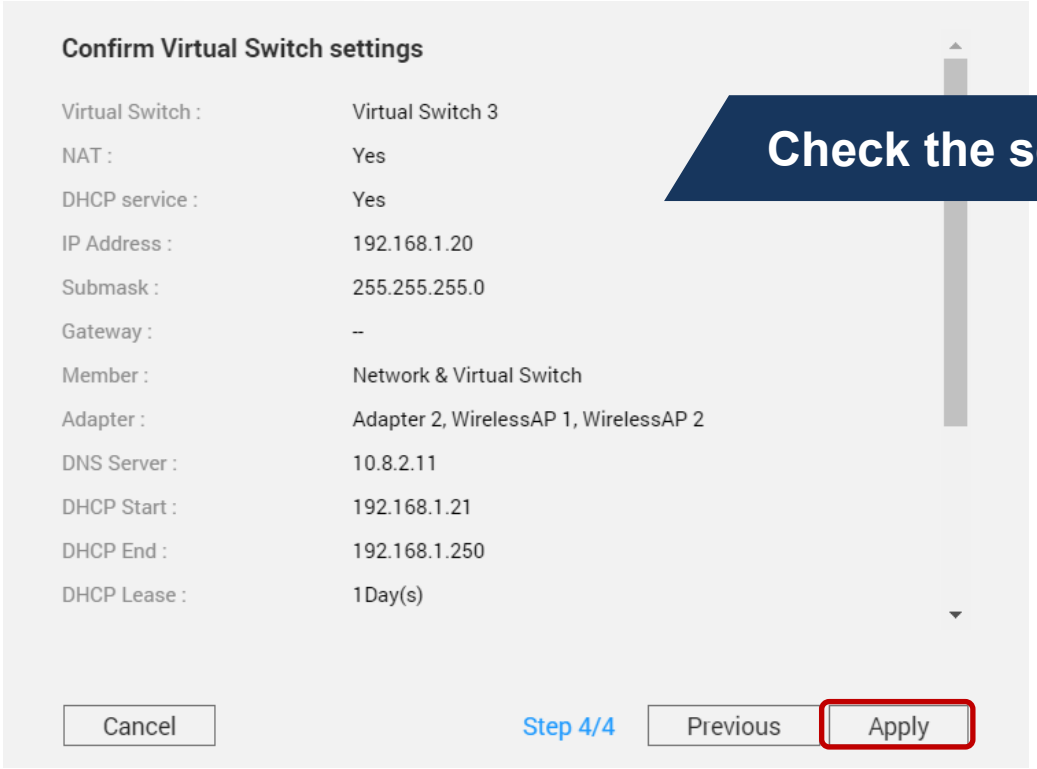
Set up the Virtual Switch IP address



Enable NAT and DHCP Server

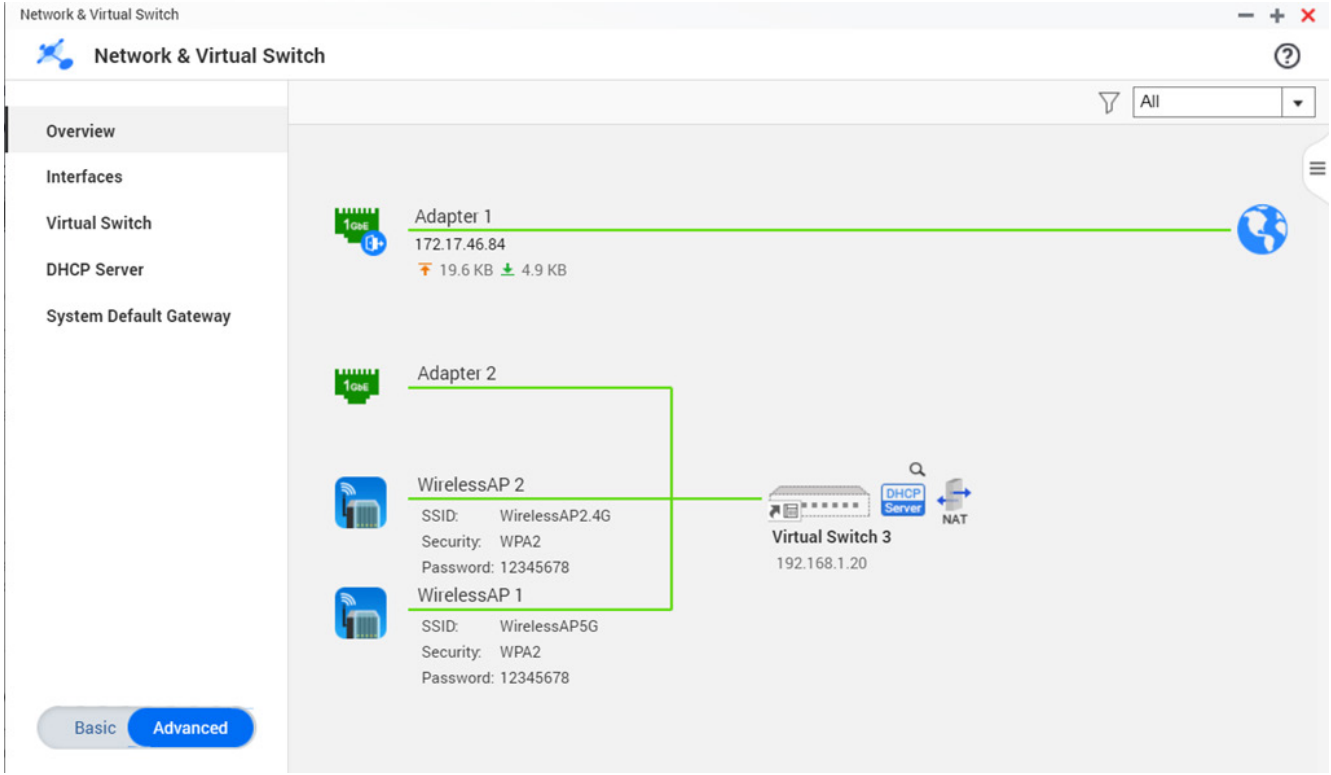


Confirm setting and Apply



Check the setting

Setting completed



QNAP

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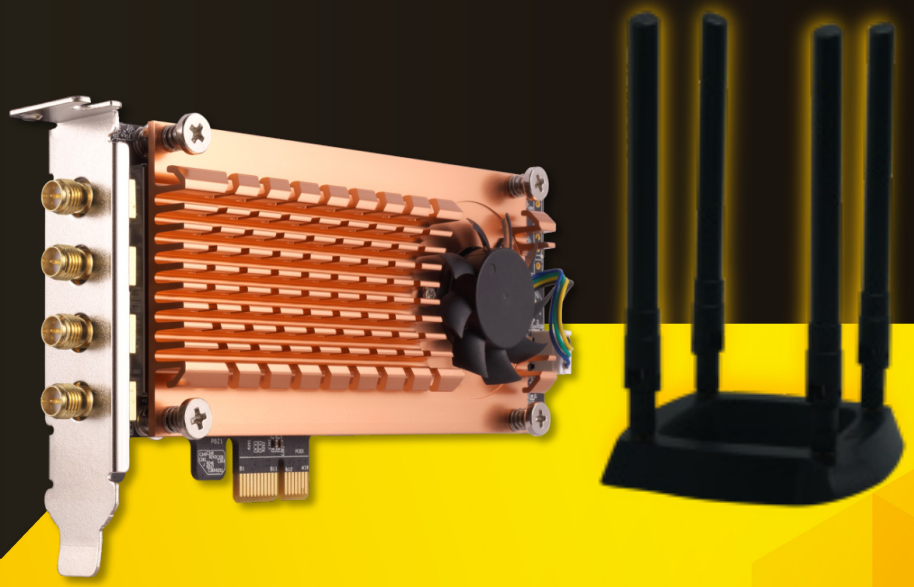
Made for Ubuntu PC and QNAP NAS



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