



**QNAP**

# **TS-451D2**

**TS-451D2-2G**

**TS-451D2-4G**

**用户指南**

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# 1. 前言





## 关于本指南

本指南提供有关设备的信息以及有关硬件安装的分步说明。此外，还提供了有关基本操作和故障排除信息的说明。

## 受众

本文档的目标读者为用户和存储管理员。本指南假定用户已对存储和备份概念有基本了解。

## 文档约定

符号	描述
	注释，提供默认配置设置和其他补充信息。
	重要注释，提供有关所需配置设置的信息以及其他关键信息。
	提示，提供有关执行任务或配置设置的建议或备选方法。
	警告，提供警告信息，如果忽略此信息，可能会导致潜在损失、伤害甚至死亡。

## 2. 产品概述

本章提供有关 QNAP 设备的基本信息。

### 关于 TS-451D2

TS-451D2 由 Intel® Celeron® J4025 双核 2.0 GHz 处理器提供支持。TS-451D2 具有高效的文件管理、数据保护和 HDMI 输出功能和极高的存储潜能，可用于存储、共享和备份文件。家庭用户可以享受流式传输和直接 4K HDMI 2.0 输出的多媒体体验，而 SOHO 用户可以实现多个用户在本地或远程访问文件。NAS 支持最多 8 GB DDR4 内存，并具有四个 USB 3.2 Gen 1 端口和两个千兆位以太网端口，可实现更好的连接性。

### 硬件规格



#### 警告


- 如果您的 QNAP 产品有硬件方面的缺陷，请将产品退回 QNAP 或 QNAP 授权的服务中心进行维修或更换。您本人或未经授权的第三方对产品进行的任何维修或维护流程均会使保修失效。
- 对于因未经授权进行的修改和安装不受支持的第三方应用程序而造成的任何损坏或数据丢失，QNAP 概不负责。
- 有关详细信息，请参见 [QNAP 产品保修服务条款](#)。



#### 提示

型号规格如有更改，恕不另行通知。要查看最新规格，请转到 <https://www.qnap.com>。

订购部件号	CPU	内存	电源
TS-451D2-2G	Intel® Celeron® J4025	2 GB	交流适配器
TS-451D2-4G	Intel® Celeron® J4025	4 GB	交流适配器

组件	TS-451D2-2G	TS-451D2-4G
处理器		
CPU	Intel® Celeron® J4025	
频率	双核 2.0 GHz 基本/2.9 GHz 脉冲	
架构	x86 64 位	
加密引擎	支持	
内存		
预安装内存	2 GB RAM: 1 x 2 GB DDR4 SODIMM	4 GB RAM: 1 x 4 GB DDR4 SODIMM
内存插槽	2 x DDR4 SODIMM	
	 <b>注</b> 请仅使用 QNAP 内存模块，以保证系统性能和稳定性。对于有多个内存插槽的 NAS 设备，请使用规格相同的 QNAP 模块。使用不受支持的模块可能导致性能下降、引发错误或使操作系统无法启动。	
最大内存	8 GB RAM: 2 x 4 GB	
闪存	4 GB (双重引导操作系统保护)	

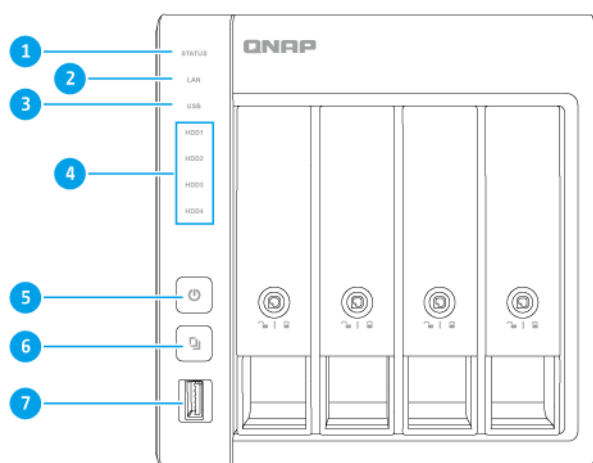
组件	TS-451D2-2G	TS-451D2-4G
存储		
硬盘架	4 x 3.5 英寸 SATA 6 Gbps  <b>注</b> NAS 也向后兼容 3 Gbps。	
硬盘兼容性	3.5 英寸硬盘架： <ul style="list-style-type: none"> <li>• 3.5 英寸 SATA 机械硬盘</li> <li>• 2.5 英寸 SATA 机械硬盘</li> <li>• 2.5 英寸 SATA 固态硬盘</li> </ul>	
SSD 缓存加速支持	支持	
热插拔	支持	
网络		
千兆位以太网端口	2 x GbE RJ45	
网络唤醒	是 (GbE RJ45)	
外部 I/O 端口和扩展插槽		
USB 端口	正面： 1 x USB 3.2 Gen 1 背面： 3 x USB 3.2 Gen 1	
HDMI 端口	1 x HDMI 2.0 (60 Hz 时分辨率最高 4096 x 2160)	
界面		
按钮	<ul style="list-style-type: none"> <li>• 电源</li> <li>• USB 一键复制</li> <li>• 重置</li> </ul>	
尺寸		
外形规格	立式	
尺寸 (高 x 宽 x 深)	165.3 x 160 x 219.4 mm (6.50 x 6.29 x 8.63 英寸)	
净重	2.09 kg (4.60 磅)	
其他		
电源单元	90W, 100-240V AC, 50/60 Hz	
系统电池	CR2032 锂电池 3V	
噪声声级	18.5 dB(A)  <b>注</b> 噪声声级在距 NAS 一米以内的旁观者位置测得。测试 NAS 安装了最大数量的硬盘以低速运行。	
风扇	系统：1 x 120mmV DC	
工作温度	0°C 至 40°C (32 至 104°F)	
相对湿度	<ul style="list-style-type: none"> <li>• 无冷凝相对湿度：5% 至 95%</li> <li>• 湿球温度：27°C (80.6°F)</li> </ul>	
安全锁孔	Kensington 安全锁孔	

**提示**

有关兼容的硬盘型号和扩展卡的列表，请转到 <https://www.qnap.com/compatibility>。

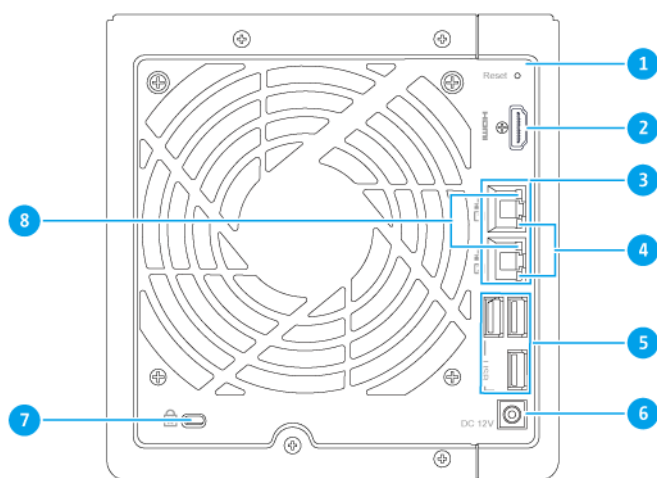
**包装内容**

项目	数量
TS-451D2	1
交流电源适配器	1
电源线	1
以太网线	1 x CAT5e
硬盘托盘钥匙	2
适用于 3.5 英寸硬盘的螺丝	8
适用于 2.5 英寸硬盘的螺丝	6
快速安装指南 (QIG)	1

**组件****前面板**

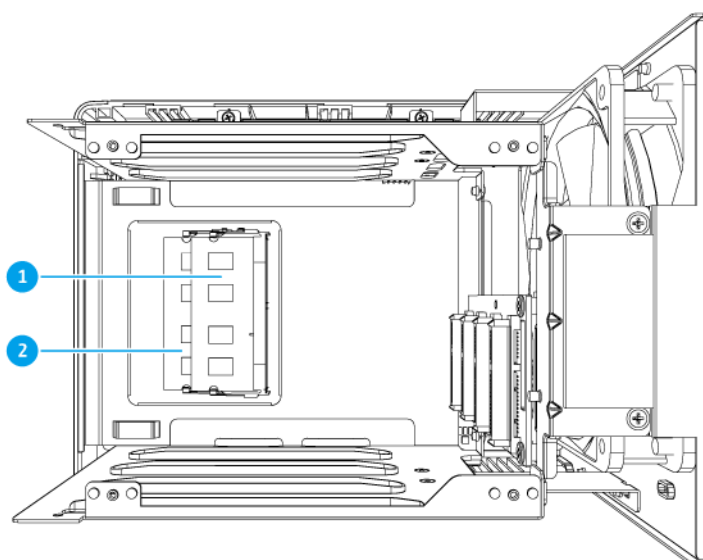
编号	组件	编号	组件
1	状态 LED	5	电源按钮
2	LAN LED	6	USB 一键复制按钮
3	USB LED	7	USB 3.2 Gen 1 一键复制 A 型端口
4	硬盘 LED	-	-

## 后面板



编号	组件	编号	组件
1	重置按钮	5	USB 3.2 Gen 1 A 型端口
2	HDMI 2.0 端口	6	电源端口
3	千兆位以太网端口	7	Kensington 安全锁孔
4	千兆位以太网速度 LED	8	千兆位以太网活动 LED

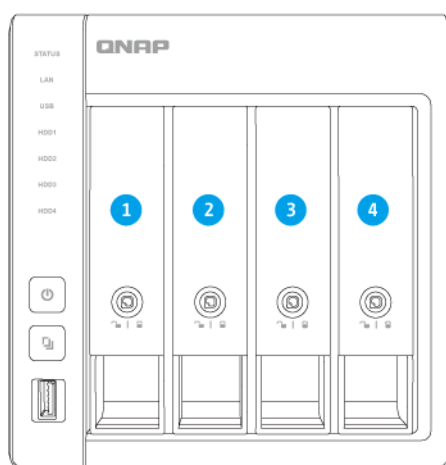
## 左面板



编号	组件	编号	组件
1	内存插槽 1	2	内存插槽 2



## 硬盘编号



## 安全信息

以下说明有助于确保个人安全和环境安全。在执行任何操作之前，请仔细阅读这些说明。

### 一般说明

- 设备应存放在通过器具、锁和钥匙或任何安保措施限制进入的安全场所。
- 只有经过授权并掌握技能的合格人员才能实际接触设备，相关人员需了解所有限制措施、安全预防措施和安装维护流程。
- 为避免潜在伤害或组件的损坏，请务必等硬盘和其他内部系统组件冷却后再触碰。
- 请执行静电放电 (ESD) 规程，以避免可能的人员受伤或组件受损。

### 电源

- 为降低失火或触电风险，请确保只将电源线连接到接地良好的电源插座。



配备冗余电源的设备可能有一条或多条电源单元 (PSU) 线。为避免受到严重伤害，安装或更换系统组件前，经培训的维修技师必须先从设备拔下所有 PSU 线。

### 系统电池

- 为避免潜在的电池爆炸、导致人员受伤或组件受损，请确保使用同型电池更换现有电池。
- 请按当地法规或电池制造商的指示正确处置使用过的电池。

## 运动的部件



**转动的风扇叶片：** 在设备连接到电源时，使您的身体各部位远离正在转动的风扇叶片。



**运动的组件：** 使您的身体各部位远离正在运动的其他组件。

## 安装要求

类别	项目
环境	<ul style="list-style-type: none"> <li>室温：0°C 至 40°C (32 至 104°F)</li> <li>无冷凝相对湿度：5% 至 95%</li> <li>湿球温度：27°C (80.6°F)</li> <li>平坦的防静电表面，无直射阳光、液体或化学药剂</li> <li>无可能阻塞 NAS 通风或者压住 NAS 或电源线的物品</li> </ul>
硬件和外围设备	<ul style="list-style-type: none"> <li>存储硬盘 有关兼容硬盘型号的列表，请转到 <a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>。</li> <li>网线</li> </ul>
工具	<ul style="list-style-type: none"> <li>1 号或 2 号十字螺丝刀</li> <li>防静电腕带</li> </ul>

## 设置 NAS



### 重要

在设置 NAS 或安装 NAS 组件之前，请仔细阅读[安全信息](#)中的所有安全要求和信息。

- 将 NAS 设备置于符合要求的环境中。  
有关详细信息，请参见[安装要求](#)。
- 安装硬盘。  
有关详细信息，请参见以下主题：
  - [在 3.5 英寸托盘上安装 3.5 英寸硬盘](#)
  - [在 3.5 英寸托盘上安装 2.5 英寸硬盘或固态硬盘](#)
- 可选: 更换内存模块。
- 连接电源线和所有适用的线缆。

5. 启动 NAS 电源。
6. 安装 QTS。  
有关详细信息，请参见 [QTS 安装](#)。
7. 登录 QTS。

## 3. 硬件安装

本节提供有关安装硬盘、内存模块和扩展卡的信息。

### 硬盘安装

TS-451D2 兼容 3.5 英寸硬盘、2.5 英寸硬盘以及 2.5 英寸固态硬盘。

#### 在 3.5 英寸托盘上安装 3.5 英寸硬盘



#### 警告

- 安装硬盘将删除硬盘上的所有数据。
- 请执行静电放电 (ESD) 规程，以避免组件损坏。

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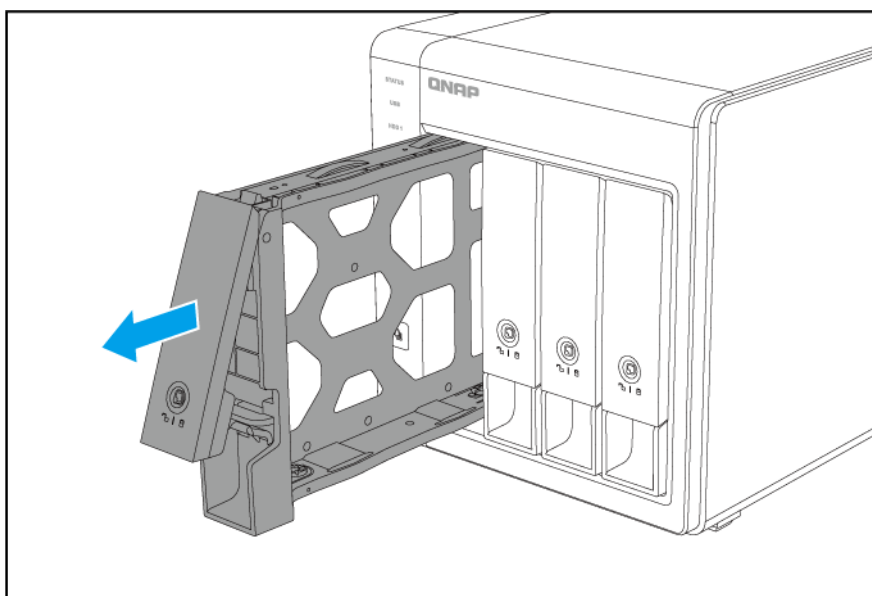
**转动的风扇叶片：**使您的双手和身体其他部位远离正在转动的风扇叶片。

•



**其他运动的组件：**使您的双手和身体其他部位远离正在运动的其他组件。

1. 关闭 NAS 电源。
2. 取下硬盘托盘。
  - a. 拉动手柄以松开托盘。
  - b. 拉出托盘。



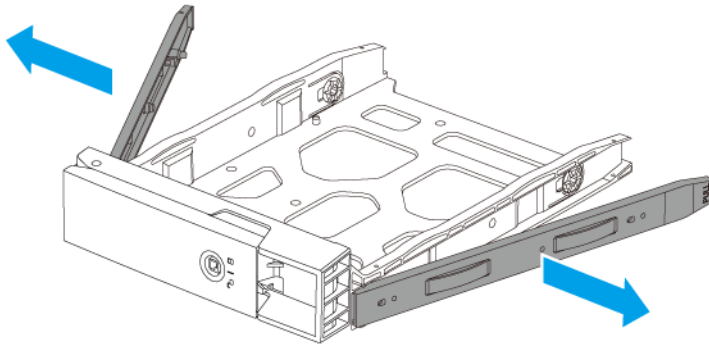


**注**  
预装硬盘托盘未锁定。

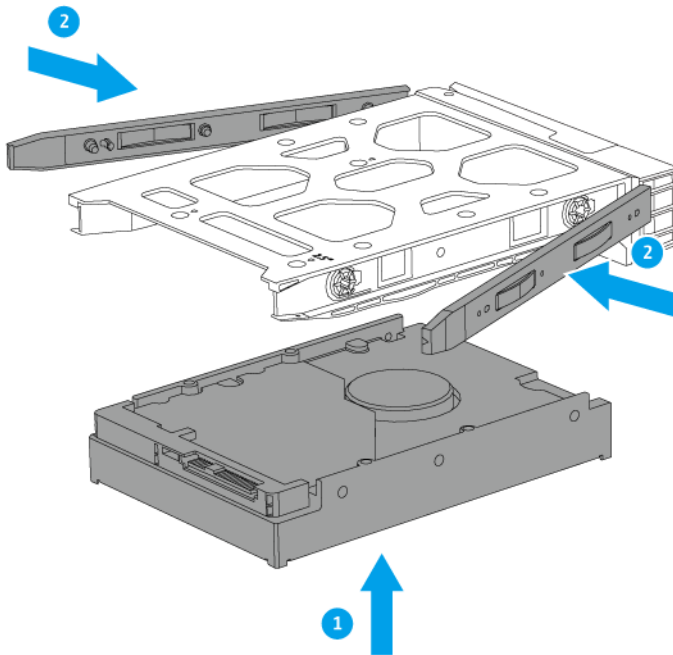


**重要**  
请确保将硬盘托盘钥匙存放在安全的地方。

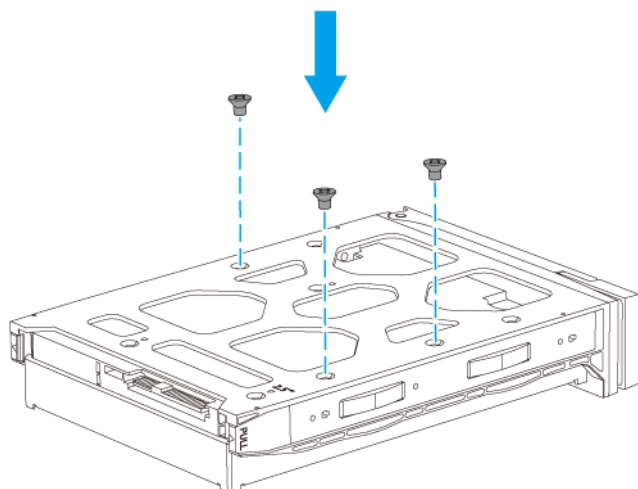
3. 将硬盘安装到托盘上。
  - a. 取下硬盘托盘两侧的固定面板。



- b. 将硬盘放在托盘上，使硬盘两侧的孔与托盘两侧的孔对齐。
  - c. 装上固定面板，将硬盘锁定在托盘上。



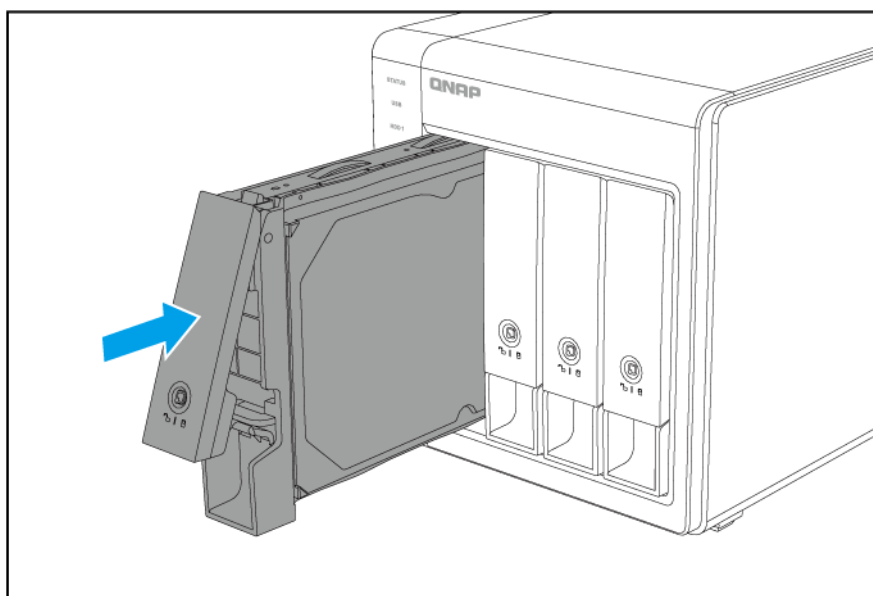
d. 安装螺丝。



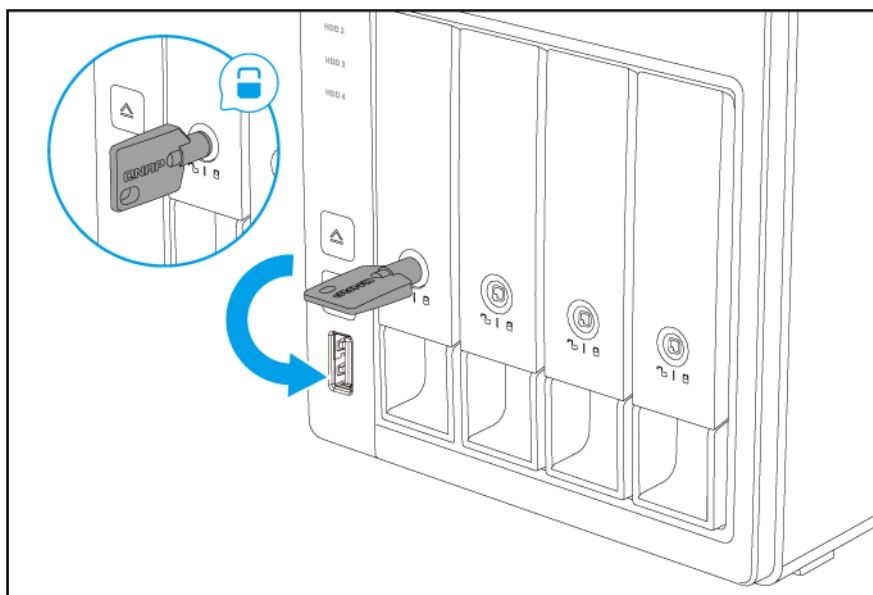
4. 将托盘装入硬盘架。

a. 将托盘插入硬盘架。

b. 推动手柄。



c. 锁住托盘。



5. 启动 NAS 电源。

### 在 3.5 英寸托盘上安装 2.5 英寸硬盘或固态硬盘



#### 警告

- 安装硬盘将删除硬盘上的所有数据。
- 请执行静电放电 (ESD) 规程，以避免组件损坏。

•



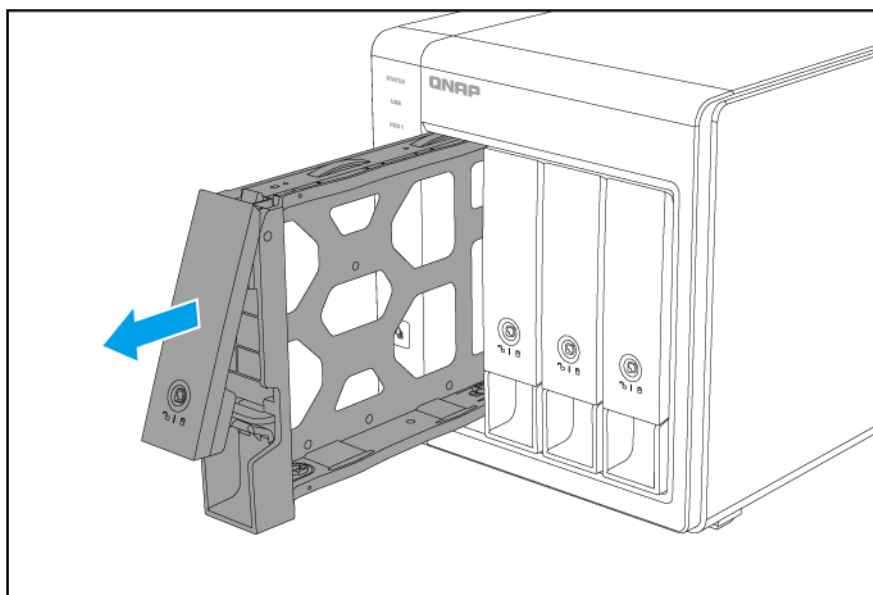
**转动的风扇叶片：**使您的双手和身体其他部位远离正在转动的风扇叶片。

•



**其他运动的组件：**使您的双手和身体其他部位远离正在运动的其他组件。

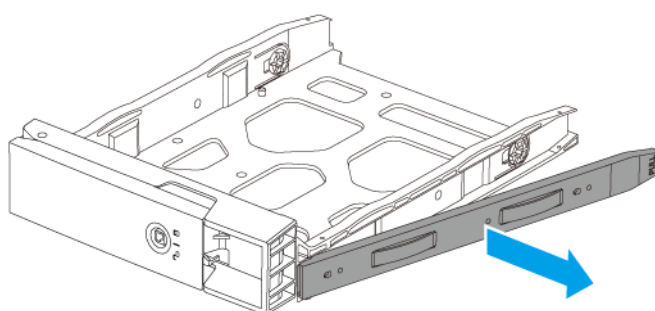
1. 关闭 NAS 电源。
2. 取下硬盘托盘。
  - a. 拉动手柄以松开托盘。
  - b. 拉出托盘。



**注**  
预装硬盘托盘未锁定。

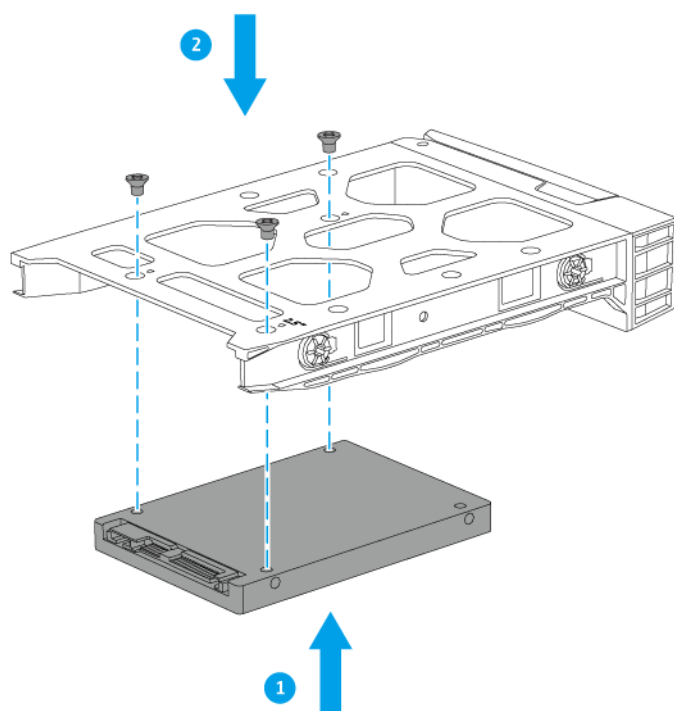
**重要**  
请确保将硬盘托盘钥匙存放在安全的地方。

3. 将硬盘安装到托盘上。
  - a. 取下硬盘托盘右侧的固定面板。



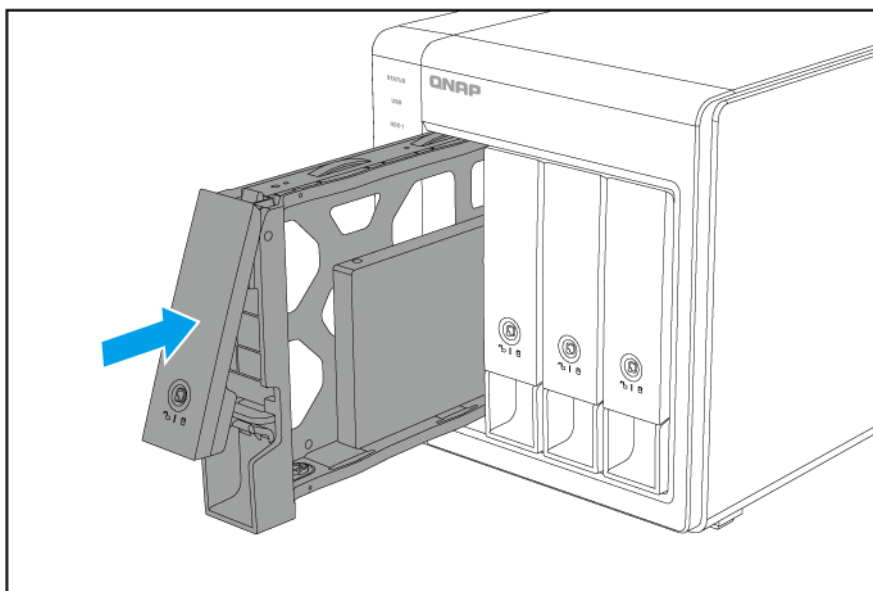
- b. 将硬盘放在托盘上，使硬盘底部的孔与托盘底部的孔对齐。
    - c. 安装螺丝。



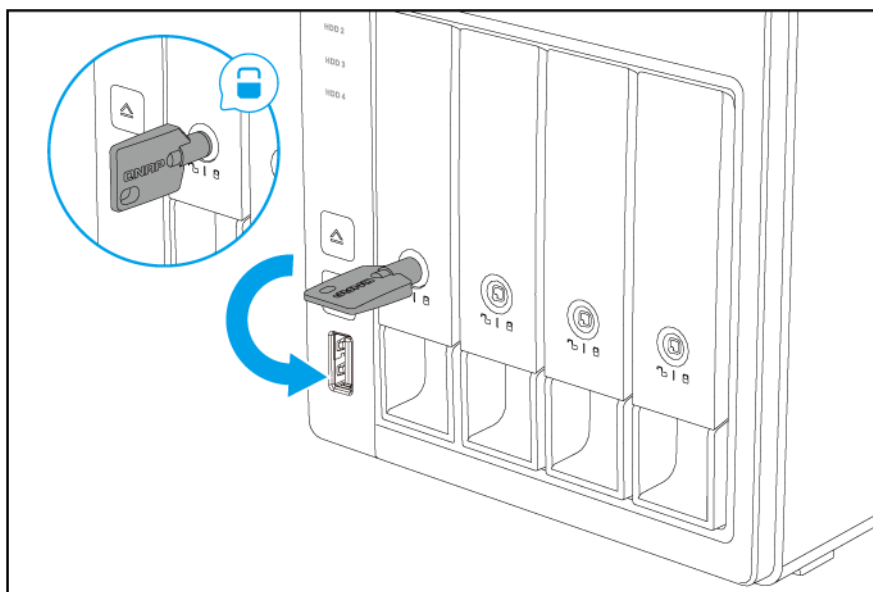


**4. 将托盘装入硬盘架。**

- a. 将托盘插入硬盘架。
- b. 推动手柄。



- c. 锁住托盘。



5. 启动 NAS 电源。

## 安装扩展单元

TS-451D2 支持 USB 扩展单元。有关详细信息，请参见下表。

要将设备连接到 USB 扩展单元，需要 USB A 型至 USB C 型线缆。

您可以从 QNAP 或授权经销商处购买存储扩展配件。

有关详细信息，请转到 <https://shop.qnap.com>。

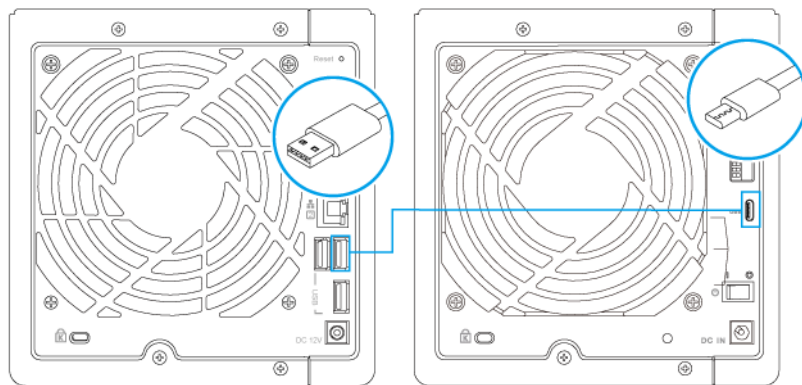
有关兼容扩展单元的列表和最大可应用扩展单元数，请转到 <http://www.qnap.com/go/compatibility-expansion>。

扩展单元型号	描述	所需配件
TR-002	<ul style="list-style-type: none"> <li>使用 USB 3.2 Gen 2 C 型接口</li> <li>支持 SATA 硬盘</li> </ul>	USB 3.2 Gen 2 A 型至 C 型线缆
TR-004	<ul style="list-style-type: none"> <li>使用 USB 3.2 Gen 1 C 型接口</li> <li>支持 SATA 硬盘</li> </ul>	USB 3.2 Gen 1 A 型至 C 型线缆
TR-004U	<ul style="list-style-type: none"> <li>使用 USB 3.2 Gen 1 C 型接口</li> <li>支持 SATA 硬盘</li> </ul>	<ul style="list-style-type: none"> <li>USB 3.2 Gen 1 A 型至 C 型线缆</li> <li>RAIL-B02</li> </ul>
TL-D800C	<ul style="list-style-type: none"> <li>使用 USB 3.2 Gen 2 C 型接口</li> <li>支持 SATA 硬盘</li> </ul>	USB 3.2 Gen 2 A 型至 C 型线缆
TL-R1200C-RP	<ul style="list-style-type: none"> <li>使用 USB 3.2 Gen 2 C 型接口</li> <li>支持 SATA 硬盘</li> </ul>	USB 3.2 Gen 2 A 型至 C 型线缆

1. 将扩展单元连接到 NAS。

a. 将 USB 线缆连接到扩展单元上的 USB C 型端口。

- b. 将 USB 线缆连接到 NAS 上的 USB 3.2 Gen 1 A 型端口。



#### 注

对于配备 USB C 型端口的 NAS，您可以购买可选的 C 型到 C 型电缆。

2. 为扩展单元接通电源。
3. 确认 NAS 能够识别扩展单元。
  - a. 以管理员身份登录 QTS。
  - b. 转到**主菜单 > 存储与快照总管 > 概述 > 系统**。
  - c. 确认扩展单元已列出。

## 更换内存模块

请仅使用 QNAP 内存模块，以保证系统性能和稳定性。可以从授权经销商处购买 QNAP 内存模块。



#### 警告

- 请执行静电放电 (ESD) 规程，以避免组件损坏。

•



**转动的风扇叶片：**使您的双手和身体其他部位远离正在转动的风扇叶片。

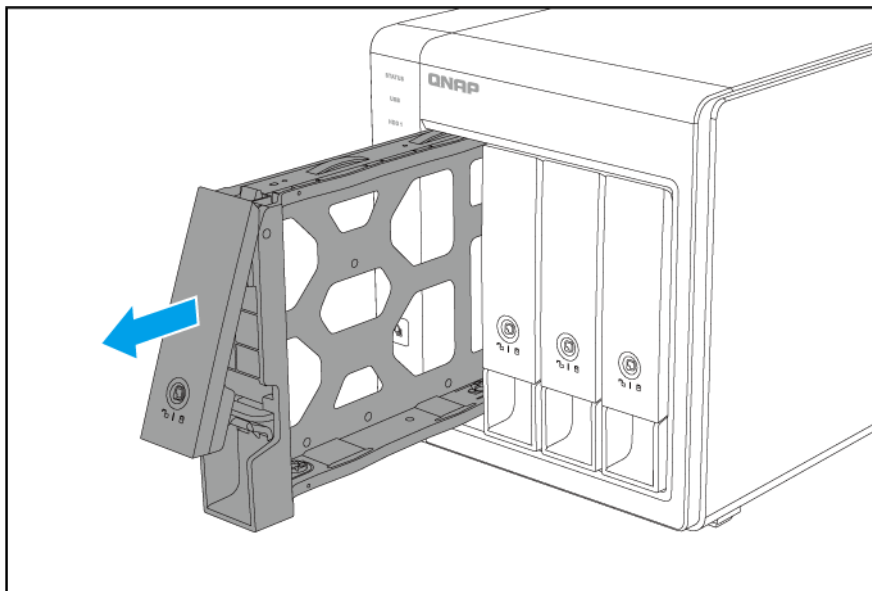
•



**其他运动的组件：**使您的双手和身体其他部位远离正在运动的其他组件。

1. 关闭设备。

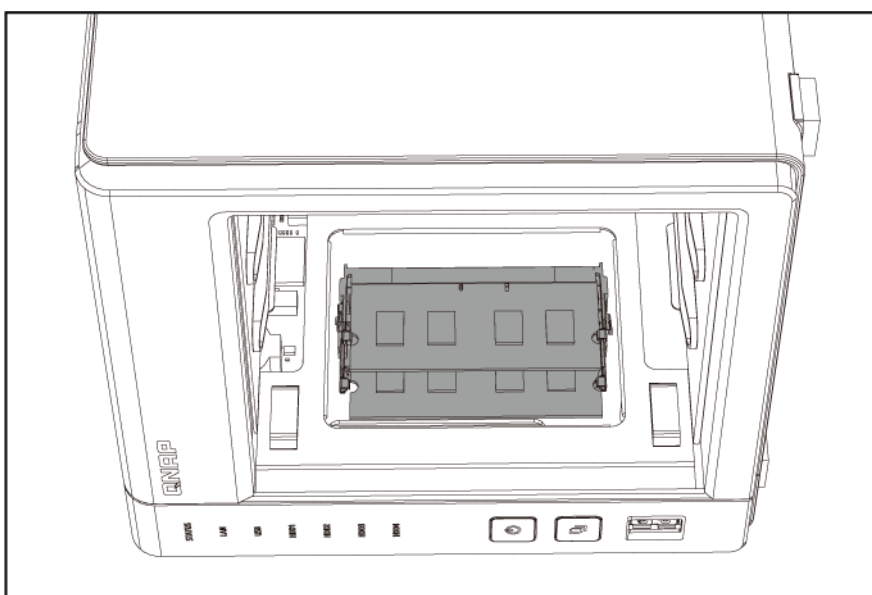
2. 从插座上拔下电源线。
3. 拔掉所有线缆和外接部件。
4. 取下硬盘托盘。
  - a. 拉动手柄以松开托盘。
  - b. 拉出托盘。



### 重要

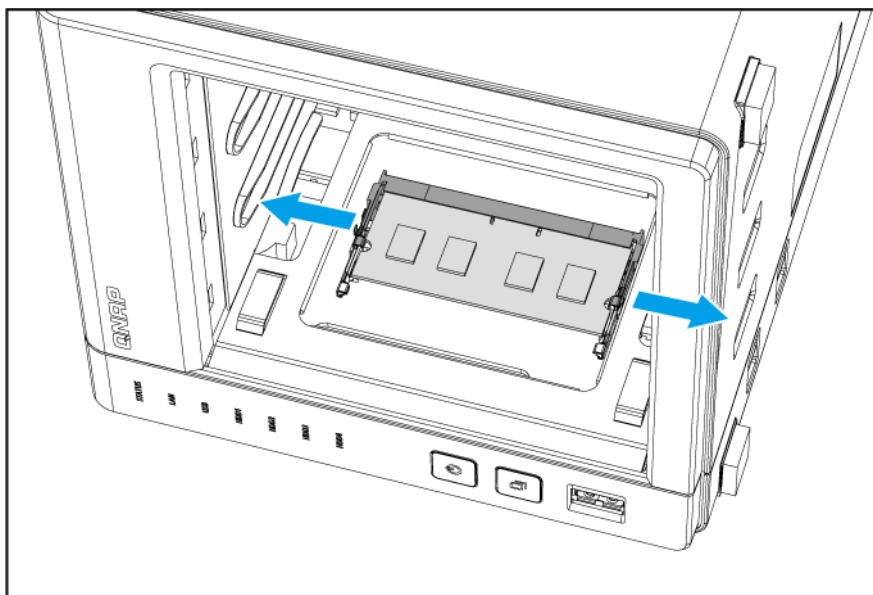
请记住每个硬盘的编号。硬盘托盘需要装回原来所在的硬盘架。  
有关详细信息，请参见[硬盘编号](#)。

5. 将设备左侧朝下放置。



## 6. 取下现有模块。

- a. 同时向外推动固定夹以释放模块。



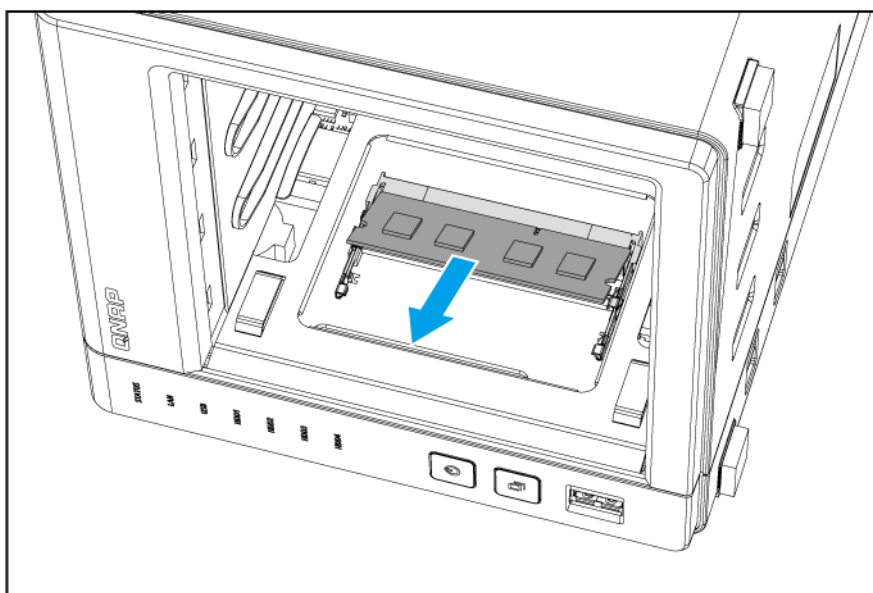
- b. 确认模块向上倾斜并已完全脱离插槽。



### 警告

如果尝试在模块尚未完全脱离时将其取出，可能会损坏模块和主板。

- c. 握住模块边缘。
- d. 小心将模块滑出插槽。



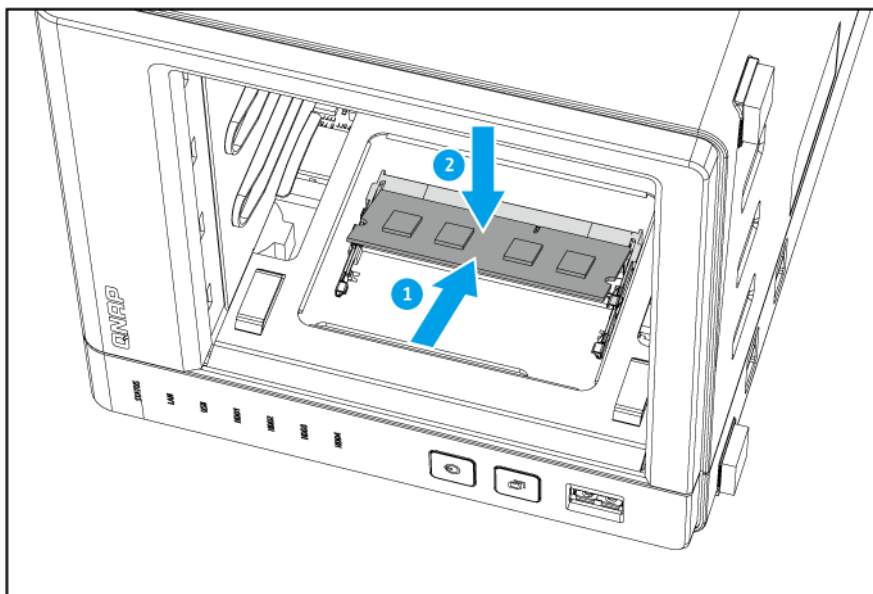
### 警告

- 请勿触摸内部组件，特别是金属接头。

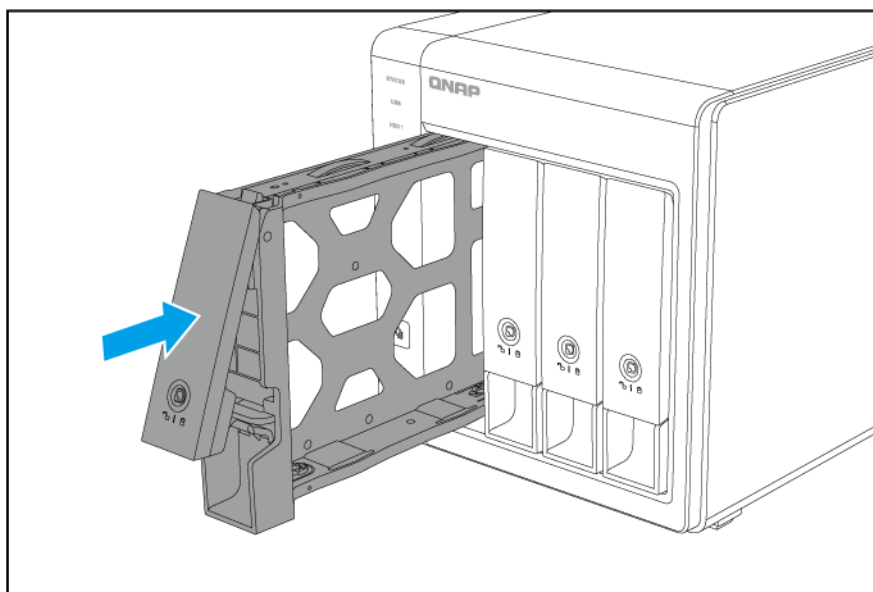
- 不要折弯模块。

## 7. 安装新模块。

- 将凹口与插槽内的凸起对齐。
- 将模块插入插槽中。
- 确认金属接头已完全插入插槽中。
- 小心地向下按压模块，直到固定夹将模块锁定到位。



- 将设备正常直立放置。
- 将硬盘托盘装回原来所在的硬盘架。
  - 将硬盘托盘滑入硬盘架。
  - 推入手柄。



10. 连接所有线缆和外接部件。
11. 启动设备。
12. 确认设备能够识别该模块。
  - a. 以管理员身份登录 QTS。
  - b. 转到**控制台 > 系统 > 系统状态 > 硬件信息**。
  - c. 检查**内存总容量**值。

## 4. QTS 安装

方法	描述	要求
Qfinder Pro 安装 (推荐)	如果 NAS 已连接到您的局域网, 可以执行以下操作: <ul style="list-style-type: none"> <li>• 使用 Qfinder Pro 定位 NAS。</li> <li>• 完成“智能安装指南”向导中的步骤。</li> </ul>	<ul style="list-style-type: none"> <li>• 计算机</li> <li>• 网线</li> <li>• Qfinder Pro 安装程序</li> </ul>
云安装	如果 NAS 已连接到 Internet, 可以执行以下操作: <ul style="list-style-type: none"> <li>• 扫描 NAS 上的二维码。</li> <li>• 指定 Cloud Key。</li> <li>• 登录您的 myQNAPcloud 帐户。</li> <li>• 使用 myQNAPcloud Link 远程访问 NAS。</li> <li>• 完成“智能安装指南”向导中的步骤。</li> </ul>	<ul style="list-style-type: none"> <li>• 计算机或移动设备</li> <li>• myQNAPcloud 帐户</li> <li>• Cloud Key</li> </ul>
本地安装	如果 NAS 支持 HDMI 输出, 可以执行以下操作: <ul style="list-style-type: none"> <li>• 将 NAS 连接到所需的硬件。</li> <li>• 完成“智能安装指南”向导中的步骤。</li> </ul>	<ul style="list-style-type: none"> <li>• 监视器</li> <li>• HDMI 线缆</li> <li>• USB 键盘或遥控器 (仅部分型号提供)</li> </ul>

### 使用 Qfinder Pro 安装 QTS



#### 警告

安装 QTS 将删除硬盘上的所有数据。请先备份您的数据, 然后再继续。

1. 启动 NAS 电源。
2. 将 NAS 连接到您的局域网中。
3. 在已连接到同一局域网的计算机上运行 Qfinder Pro。



#### 注

要下载 Qfinder Pro, 请转到 <https://www.qnap.com/utilities>。

4. 在列表中找到 NAS, 然后双击名称或 IP 地址。  
智能安装指南将在默认 Web 浏览器中打开。
5. 单击启动智能安装指南。
6. 指定以下信息。
  - **NAS 名称:** 指定 1 至 14 个字符的名称。名称支持字母 (A 到 Z、a 到 z)、数字 (0 到 9) 和连字符 (-), 但不能以连字符结尾。



- **密码**：指定 1 至 64 个字符的管理员密码。密码支持所有 ASCII 字符。

7. 单击**下一步**。
8. 指定时区、日期和时间。



#### 提示

QNAP 建议连接到 NTP 服务器，以确保 NAS 遵循协调世界时 (UTC) 标准。

9. 单击**下一步**。
10. 选择**自动获取 IP 地址(DHCP)**。
11. 单击**下一步**。
12. 选择将用于访问 NAS 上共享文件夹的设备类型。
13. 单击**下一步**。
14. 检查设置。
15. 单击**应用**  
此时会出现确认消息。



#### 警告

单击**确认**后，将先删除硬盘上的所有数据，然后再安装 QTS。

16. 单击**确认**。  
QTS 即安装完毕。

## 使用 Cloud Key 安装 QTS



#### 警告

安装 QTS 将删除硬盘上的所有数据。请先备份您的数据，然后再继续。

1. 启动 NAS 电源。
2. 将 NAS 连接到 Internet。
3. 使用以下方法之一转到“QNAP Cloud 安装”页面：
  - 在您的计算机上，转到 <http://install.qnap.com>。
  - 使用移动设备扫描 NAS 上的二维码。

网页中会列出本地网络上所有尚未初始化的 QNAP NAS 设备。

4. 从列表中找到您的 NAS，然后单击**初始化**。



#### 注

如果未列出您的 NAS，请按网页上的说明指定 NAS 上的 Cloud Key。

安装向导将在默认 Web 浏览器中打开。

5. 创建帐户或登录 myQNAPcloud。



#### 注

创建帐户后，您必须返回此页面才能完成安装。

- 为 NAS 指定 myQNAPcloud 设备名称。



#### 注

- myQNAPcloud 设备名称用于远程访问 NAS。
- 因安全原因，在您的 NAS 上初始化 myQNAPcloud Link 远程连接服务后，会将其禁用。通过 LAN 连接到 QTS，然后安装 myQNAPcloud Link 可启用此服务。

- 单击下一步。

智能安装指南将在默认 Web 浏览器中打开。

- 单击启动智能安装指南。

- 指定以下信息。

- **NAS 名称**：指定 1 至 14 个字符的名称。名称支持字母（A 到 Z、a 到 z）、数字（0 到 9）和连字符 (-)，但不能以连字符结尾。
- **密码**：指定 1 至 64 个字符的管理员密码。密码支持所有 ASCII 字符。

- 单击下一步。

- 指定时区、日期和时间。



#### 提示

QNAP 建议连接到 NTP 服务器，以确保 NAS 遵循协调世界时 (UTC) 标准。

- 单击下一步。

- 选择自动获取 IP 地址(DHCP)。

- 单击下一步。

- 选择将用于访问 NAS 上共享文件夹的设备类型。

- 单击下一步。

- 检查设置。

- 单击应用

此时会出现确认消息。



#### 警告

单击确认后，将先删除硬盘上的所有数据，然后再安装 QTS。

- 单击确认。

QTS 即安装完毕。

## 使用 HDMI 连接安装 QTS



#### 警告

安装 QTS 将删除硬盘上的所有数据。请先备份您的数据，然后再继续。

- 将 HDMI 显示器连接到 NAS。
- 将 USB 键盘连接到 NAS 或准备好 QNAP 红外遥控器（仅部分型号提供）。
- 启动 NAS 电源。

此时会出现“智能安装指南”的欢迎屏幕。

4. 选择**启动智能安装指南**。

5. 选择**否，跳过此过程**。

启用多媒体功能后，可以在“存储与快照总管”中配置磁盘后安装多媒体应用程序。

有关在 QTS 上启用多媒体功能的详细信息，请参见《QTS 用户指南》的“系统管理”一节。

6. 选择**稍后配置**。

有关配置磁盘的详细信息，请参见《QTS 用户指南》的“存储与快照总管”一节。

7. 检查设置。

8. 单击**下一步**。

9. 检查设置。

10. 单击**下一步**。

此时会出现**确认**屏幕。



**警告**

单击**下一步**后，将先删除硬盘上的所有数据，然后再安装 QTS。

11. 单击**下一步**。


QTS 即安装完毕。

## 5. 基本操作

本章介绍 NAS 的基本操作。

### 电源按钮

操作	用户操作	结果
启动电源	按下此按钮一次。	设备开机。
关闭电源	按住此按钮 1.5 秒钟。	设备关机。
强制关机	按住此按钮 5 秒钟。	设备关机。

 **重要**  
 仅当设备无响应时才能使用此方法。

### 重置按钮

操作	用户操作	结果
基本系统重置	按住此按钮 3 秒钟。	<p>以下设置将重置为默认值：</p> <ul style="list-style-type: none"> <li>• 系统管理员密码：默认密码为第一个 MAC 地址（去掉特殊字符），以大写字母表示。例如，如果第一个 MAC 地址为 00-08-9B-F6-15-75，则管理员密码将为 00089BF61575。</li> </ul> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;">  <b>提示</b>              您可以使用 Qfinder Pro 找到第一个 MAC 地址。设备上粘贴的标签也会在 MAC1 下列出此地址。           </div> <ul style="list-style-type: none"> <li>• TCP/IP 配置：               <ul style="list-style-type: none"> <li>• 通过 DHCP 自动获取 IP 地址设置</li> <li>• 禁用巨型帧</li> <li>• 如果启用端口中继（仅限多局域网型号），则端口中继模式将重置为“主动备份(故障转移)”。</li> </ul> </li> <li>• 系统端口：8080（系统服务端口）</li> <li>• 安全等级：低（允许所有连接）</li> <li>• VLAN：禁用</li> </ul>

操作	用户操作	结果
高级系统重置	按住此按钮 15 秒钟。	恢复默认出厂设置。 <ul style="list-style-type: none"> <li>要在高级系统重置后检索旧数据，请在 NAS 上重新创建先前的文件夹结构。</li> </ul>

## USB 一键复制按钮


使用 USB 一键复制按钮，可以将数据备份从 USB 设备复制到 NAS，或将数据备份从 NAS 复制到 USB 设备。

此功能支持增量备份。NAS 只会复制在上次备份后修改或添加的文件。

## LED

开启设备电源后，LED 指示灯会指示系统状态和相关信息。以下 LED 信息仅适用于硬盘已正确安装并且设备已连接到网络或主机的情况。

有关 LED 位置的详细信息，请参见[组件](#)。

LED	状态	描述
系统状态	红绿交替闪烁，间隔 0.5 秒	<ul style="list-style-type: none"> <li>• 硬盘正在格式化。</li> <li>• 设备正在初始化。</li> <li>• 操作系统正在更新。</li> <li>• RAID 正在重建。</li> <li>• 正在进行在线 RAID 容量扩展。</li> <li>• 正在进行在线 RAID 级别迁移。</li> <li>• 固件正在更新。</li> </ul> <p> <b>注</b> 更新固件时，请勿拔下电源线或 USB 缆线，也不要强行退出应用程序。</p>
	红色	<ul style="list-style-type: none"> <li>• 硬盘无效。</li> <li>• 磁盘卷的容量已满。</li> <li>• 磁盘卷的容量即将被占满。</li> <li>• 系统风扇故障。</li> <li>• 访问（读/写）数据时出错。</li> <li>• 在硬盘上检测到坏扇区。</li> <li>• 设备处于降级只读模式（RAID 5 或 RAID 6 中的两个成员硬盘出现故障，但仍可读取数据）。</li> <li>• 硬件自检发生错误。</li> </ul>
	闪烁红色，间隔 0.5 秒	设备处于降级模式（RAID 1、RAID 5 或 RAID 6 中的一个成员硬盘出现故障）。
	闪烁红色一次	设备收到遥控器的命令。
	绿色	设备已就绪。
	闪烁绿色，间隔 0.5 秒	<ul style="list-style-type: none"> <li>• 设备未配置。</li> <li>• 硬盘未格式化。</li> </ul>
	熄灭	<ul style="list-style-type: none"> <li>• 所有硬盘都处于待机模式。</li> <li>• 设备已关机。</li> </ul>
硬盘	闪烁红色	正在访问数据，但在此过程中发生读/写错误。
	红色	发生硬盘读/写错误。
	闪烁绿色	正在访问数据。
	绿色	硬盘就绪。
	熄灭	未检测到硬盘。
LAN	橙色	网络连接以 1 Gbps 的速度运行。
	闪烁橙色	正在从网络访问设备。
	熄灭	设备未连接至网络。

LED	状态	描述
1 Gb 以太网速度	绿色	网络连接以 1 Gbps 的速度运行。
	橙色	网络连接以 100 Mbps 的速度运行。
	熄灭	<ul style="list-style-type: none"> <li>网络连接以 10 Mbps 的速度运行。</li> <li>没有网络连接。</li> </ul>
1 Gb 以太网活动	橙色	网络连接已建立。
	闪烁橙色	正在从网络访问设备。
	熄灭	没有网络连接。
USB	蓝色	检测到一个 USB 设备连接到 USB 一键复制端口。
	熄灭	未检测到 USB 扩展单元。

## 警告音

时长	频率	描述
短提示音 (0.5 秒)	1	<ul style="list-style-type: none"> <li>NAS 正在启动。</li> <li>按下重置按钮 3 秒钟后，NAS 将重置配置。</li> <li>按下重置按钮 10 秒钟后，NAS 将重置配置并重新启动。</li> <li>操作系统已更新。</li> <li>设备正在启动 USB 一键复制。</li> </ul>
	2	USB 设备已移除 (USB 一键复制按钮)。
	3	<ul style="list-style-type: none"> <li>无法检测到已安装的磁盘。</li> <li>无法将 NAS 数据复制到连接到前 USB 端口的外部存储设备。</li> </ul>

时长	频率	描述
长提示音 (1.5 秒)	3 (每 5 分钟)	<ul style="list-style-type: none"> <li>• 电源发生错误。</li> <li>• 系统风扇故障。</li> <li>• 风扇模块已移除。</li> </ul>
	2	<ul style="list-style-type: none"> <li>• 存储池的容量即将被占满。</li> <li>• 存储池的容量已满。</li> <li>• 发生存储池状态错误。</li> <li>• 磁盘卷的容量即将被占满。</li> <li>• 磁盘卷的容量已满。</li> <li>• 正在移除 USB 设备 (USB 一键复制按钮)。</li> <li>• 发生卷状态错误。</li> <li>• 插入或抽出硬盘。</li> <li>• iSCSI 的容量即将被占满。</li> </ul>
	1	<ul style="list-style-type: none"> <li>• NAS 已通过强制关闭关机 (硬件关闭)。</li> <li>• NAS 已成功开机并准备就绪。</li> </ul>
长提示音和短提示音	一长两短	JBOD 扩展单元已移除。



## 6. NAS 迁移

通过将所有硬盘从源 NAS 安装到目标 NAS，可以将数据和设置从当前 NAS 迁移到另一个型号的 NAS，从而使中断次数降到最低。迁移后，目标 NAS 上将保留 RAID 配置和其他设置。

### NAS 迁移要求

只能将硬盘迁移到特定的 NAS 型号，具体取决于源 NAS。有关与直接 NAS 迁移兼容的 NAS 型号的列表，请参见 <https://www.qnap.com/en/nas-migration>。

设备必须符合以下要求：

- QTS NAS 支持多种类型的 NAS 迁移：
  - ARM NAS 至 ARM NAS
  - x86 NAS 至 x86 NAS
  - ARM NAS 至 x86 NAS



**注**




无法从 x86 NAS 迁移至 ARM NAS。


- 目标 NAS 必须在与源 NAS 相同的 QTS 版本（或更高版本）上运行。
- 目标 NAS 必须有足够可用的硬盘架，以容纳要从源 NAS 迁移的所有硬盘。

对于不支持 NAS 迁移的 NAS 型号，可以使用 HBS 迁移现有数据。有关详细信息，请参见 [使用 HBS 复制 NAS 数据](#)。

### NAS 迁移后的状态和设置变化

迁移后，NAS 数据和设置的状态会发生变化。

数据和设置	NAS 迁移后
注册的 myQNAPcloud 名称	注册的 myQNAPcloud 名称不会迁移。
加密的磁盘卷	<p>如果 NAS 不支持文件系统加密，加密的磁盘卷不会迁移。</p> <p> <b>警告</b> 为防止数据丢失，请备份加密磁盘卷的加密密钥并将其保存在安全的位置。也可以选择迁移之前解密磁盘卷。</p>
共享文件夹	<p>所有共享文件夹及其中存储的下载文件都会得到保留。</p> <p> <b>警告</b> 为防止数据丢失，请在迁移之前备份加密共享文件夹的加密密钥或密码，并将其保存在安全的位置。</p> <p> <b>重要</b> 迁移后，必须重新配置目标 NAS 上的文件夹权限。</p>

数据和设置	NAS 迁移后
网络	<ul style="list-style-type: none"> <li>如果目标 NAS 上的网络端口数量或规格与源 NAS 不同，则以下网络和虚拟设置可能会更改并需要重新配置：端口中继、虚拟机、Thunderbolt、USB QuickAccess 等。</li> <li>在 QTS 4.3.5 或更早版本上运行源 NAS 时，必须重新配置网络设置。</li> </ul>
Windows AD 配置	必须重新配置 Windows AD 配置。
许可证	许可证不会迁移。  <b>警告</b> 为防止丢失所有软件许可证，QNAP 建议在数据迁移之前停用源 NAS 上的许可证。
应用程序	如果目标 NAS 的 RAM 少于源 NAS，则以下功能和应用程序可能无法运行：Virtualization Station、Qsirch 和快照。
服务	只能使用目标 NAS 支持的服务。
多媒体功能	默认情况下，会禁用某些多媒体功能。

## 迁移 NAS



### 重要

执行 NAS 迁移之前，请确保您已了解所有要求以及迁移后可能发生的变化。有关详细信息，请参见以下主题：

- [NAS 迁移要求](#)
- [NAS 迁移后的状态和设置变化](#)

1. 关闭源 NAS 和目标 NAS。
2. 取下硬盘。



### 重要

QNAP 建议在安装硬盘时按照源 NAS 硬盘顺序安装。拆除硬盘时，记下硬盘托盘顺序。

- a. 从源 NAS 中取下硬盘。
  - b. 从目标 NAS 中取下硬盘托盘。
3. 安装硬盘。
    - a. 将源 NAS 硬盘安装到目标 NAS 硬盘托盘上。
    - b. 将硬盘托盘插入目标 NAS 中。
  4. 启动目标 NAS 的电源。
  5. 在目标 NAS 上以管理员身份登录 QTS。  
目标 NAS 会自动检查最新固件更新。

## 使用 HBS 迁移 NAS 数据

对于不支持直接迁移的 NAS 型号，可以首先初始化目标 NAS，然后使用 HBS 3 将数据从源 NAS 复制到目标 NAS。

## 准备目标 NAS

1. 登录 QTS。
2. 创建一个或多个存储池。  
有关详细信息，请参见《QTS 用户指南》的“创建存储池”主题。
3. 创建一个或多个卷。  
有关详细信息，请参见《QTS 用户指南》的“创建卷”主题。
4. 在目标 NAS 上创建共享文件夹。  
有关详细信息，请参见《QTS 用户指南》的“创建共享文件夹”主题。
5. 将 HBS 3 安装到目标 NAS 上。
  - a. 转到 **App Center**。
  - b. 搜索 HBS 3。
  - c. 单击**安装**。  
HBS 3 已安装在目标 NAS 上。
6. 启用目标 NAS 上的远程服务器设置。
  - a. 转到 **App Center > HBS > 服务**。
  - b. 单击**启用 RTRR 服务器**。  
此时会出现“RTRR 服务器设置”窗口。
  - c. 指定 **RTRR 服务器**设置。

设置	描述
密码	指定由以下各组中的任何字符构成，包含 1 至 16 个字符的密码： <ul style="list-style-type: none"> <li>• 字母：A 至 Z、a 至 z</li> <li>• 数字：0 至 9</li> <li>• 特殊字符：。 - _ ~ ! @ # \$ % ^ &amp; ( ) { }</li> <li>• 不以空格开头或结尾。</li> </ul>
端口	指定用于访问 RTRR 服务器的端口号。

7. 单击**应用**。  
此时会出现确认窗口。
8. 单击**确定**。  
已完成远程服务器设置。

## 创建单向同步作业

1. 在源 NAS 上，转到 **App Center > HBS 3 > 同步**。
2. 单击**立即同步**。
3. 选择**单向同步作业**。  
此时会出现**创建同步作业**窗口。

#### 4. 单击远程 NAS。

此时会出现**创建存储空间**窗口。

#### 5. 选择目标 NAS 作为目标存储空间并指定以下内容：

设置	描述
名称	用于标识存储空间的名称
IP 地址/主机名	用于访问存储空间的 IP 地址或主机名   <b>提示</b> 单击 🔍 扫描可用设备。
端口	用于访问存储空间的端口号 此值必须介于 1 - 65535 之间。
密码	用于访问存储空间的密码
使用 SSL 连接	访问远程 NAS 时需要 SSL 连接

#### 6. 可选: 测试连接。

测试	描述
检测服务器	测试所选存储空间的可访问性。
速度测试	测试所选存储空间的网络连接速度。

#### 7. 单击**创建**。

#### 8. 单击**选择**。

#### 9. 选择配对文件夹。




#### 重要

- 所选文件夹中的所有子文件夹和文件都会被选中。
  - 每个作业最多只能同步 16 个配对文件夹。
- a. 在来源的下方，单击 **+**。  
此时会打开一个对话框。
  - b. 选择一个文件夹。
  - c. 单击**确定**。  
该对话框关闭。
  - d. 在目标的下方，单击 **+**。  
此时会打开一个对话框。
  - e. 选择一个文件夹。
  - f. 单击**确定**。  
该对话框关闭。
  - g. 可选: 必要时可以添加更多配对文件夹。



#### 提示

- 单击  以编辑现有文件夹。

- 单击  以删除现有配对。

10. 单击**下一步**。  
此时会出现**计划**窗口。
11. 选择**立即同步**。
12. 单击**下一步**。
13. 查看作业摘要。
14. 单击**创建**。  
源 NAS 运行创建的单向同步作业。



**注**  
将共享文件夹从源 NAS 迁移到目标 NAS 可能需要数分钟。

## 将本地用户或组设置导入目标 NAS

1. 启动源 NAS 的电源。
2. 从源 NAS 备份用户或组设置。
  - a. 登录 QTS。
  - b. 单击**导入/导出用户**。  
此时会出现**导入/导出用户**窗口。
  - c. 选择**导出用户和用户组设置**。
  - d. 单击**下一步**。  
NAS 用户和用户组设置将导出为文件，并下载到您的计算机上。
3. 源 NAS 上的用户设置已导入目标 NAS。
  - a. 在目标 NAS 上，登录 QTS。
  - b. 转到**控制台 > 权限 > 用户**。
  - c. 单击**导入/导出用户**。
  - d. 选择**导入用户和用户组设置**。



**注**  
可以选择向新创建的用户发送通知邮件或覆盖重复用户。

- e. 在您的计算机上，选择从源 NAS 导出的用户设置文件。  
有关详细信息，请参见“备份源 NAS 用户或组设置”。  
源 NAS 用户设置文件已导入目标 NAS。

## 7. 故障排除

本章介绍基本故障排除信息。

### 强制 Qfinder Pro 或 myQNAPcloud 定位 NAS

如果在 QTS 安装过程中 Qfinder Pro 或 myQNAPcloud 无法定位 NAS，则硬盘或数据可能有故障。

1. 关闭 NAS 电源。
2. 取下所有硬盘。
3. 启动 NAS 电源。
4. 使用 Qfinder Pro 或 myQNAPcloud 定位 NAS。
5. 重新插入硬盘。
6. 继续安装 QTS。

### 热插拔故障硬盘

在以下情况下，NAS 支持热插拔硬盘：

RAID 类型	磁盘数量	情形
RAID 1	2	一个成员硬盘有故障
RAID 5	$\geq 3$	一个成员硬盘有故障
RAID 6	$\geq 4$	一个或两个成员硬盘有故障
RAID 10	$\geq 4$ (必须为偶数)	处于两个不同对中的一个或两个成员硬盘有故障。
RAID 50	$\geq 6$	每个子组的一个磁盘有故障。
RAID 60	$\geq 8$	每个子组的两个磁盘有故障。

1. 登录 QTS。
2. 转到**主菜单 > 存储与快照总管 > 存储 > 磁盘/VJBOD**。
3. 找到发生故障的硬盘。
4. 准备一个与故障硬盘具有相同或更大容量的新硬盘。
5. 从设备中取下故障硬盘。
6. 等待 20 秒或设备发出两声提示音。
7. 从硬盘托盘中取下故障硬盘。
8. 将新硬盘插入硬盘托盘中。
9. 安装新硬盘。  
此时 NAS 会发出两声提示音。
10. 转到**主菜单 > 存储与快照总管 > 存储**。
11. 找到包含新硬盘的卷，然后确认状态为正在重建。

## 恢复被意外移除的正常硬盘

NAS 支持独有的 RAID 恢复技术，可以从意外断开或移除的硬盘中恢复发生故障的 RAID 磁盘卷。用户可以从降级模式恢复非活动 RAID 1、RAID 5、RAID 6、RAID 10、RAID 50 或 RAID 60 卷。

磁盘卷	RAID 恢复支持	磁盘数量	被移除硬盘的最大数量
单盘	否	1	不适用
JBOD	是	$\geq 2$	
RAID 0	是	$\geq 2$	
RAID 1	是	2	1
RAID 5	是	$\geq 3$	2
RAID 6	是	$\geq 4$	
RAID 10	否	$\geq 4$ (必须为偶数)	处于两个不同对中的一个或两个成员硬盘有故障。
RAID 50	是	$\geq 6$	每个子组的一个磁盘有故障。
RAID 60	是	$\geq 8$	每个子组的两个磁盘有故障。

## 支持和其他资源

QNAP 提供了以下资源：

资源	URL
文档	<a href="https://docs.qnap.com">https://docs.qnap.com</a>
兼容性列表	<a href="https://www.qnap.com/compatibility">https://www.qnap.com/compatibility</a>
NAS 迁移兼容性	<a href="https://www.qnap.com/en/nas-migration">https://www.qnap.com/en/nas-migration</a>
扩展单元兼容性	<a href="http://www.qnap.com/go/compatibility-expansion">http://www.qnap.com/go/compatibility-expansion</a>
服务门户	<a href="https://service.qnap.com">https://service.qnap.com</a>
产品支持状态	<a href="https://www.qnap.com/product/eol.php">https://www.qnap.com/product/eol.php</a>
下载	<a href="https://download.qnap.com">https://download.qnap.com</a>
社区论坛	<a href="https://forum.qnap.com">https://forum.qnap.com</a>
QNAP 配件商店	<a href="https://shop.qnap.com">https://shop.qnap.com</a>

## 8. 术语表

### **Cloud Key**

分配给每个 NAS 设备的唯一 8 位数代码

### **myQNAPcloud Link**

可用于通过 Internet 访问 NAS，而且不必配置复杂的端口转发设置

### **myQNAPcloud**

提供各种远程访问服务，如 DDNS 和 myQNAPcloud Link

### **QNAP ID**

用户帐户，可用于使用 myQNAPcloud 远程访问和其他 QNAP 服务

### **Qfinder Pro**

一种 QNAP 实用工具，可用于查找和访问局域网中的 QNAP NAS 设备

### **QTS**

QNAP NAS 操作系统



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Version 3, 29 June 2007

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- e. Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

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#### FCC B 类声明



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VCCI-B

**BSMI 公告****SJ/T 11364-2006**

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