

SOHORAID
ST4-TL3+
User Manual

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About this Manual

Thank you for choosing the STARDOM product. This manual will familiarize you with the STARDOM ST4-TL3+ product. We recommend reading through this manual before using the STARDOM ST4-TL3+ product. The information provided in this manual was checked before publication, but the actual product specifications may have changed before shipping; Latest product specifications and updates can be found at www.STARDOM.com.tw. No separate notifications will be provided by our company. If you would like to receive the latest STARDOM product information, manuals, and firmware, or have any questions regarding STARDOM products, please contact your local supplier or visit www.STARDOM.com.tw for more information.

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1. Environmental Requirements

Operating Temperature: 0 ~ 40 °C (32 ~ 104 °F)
Storage Temperature : -20 ~ 47°C (-4 ~ 116 °F)
Line Voltage : 100 ~ 240V AC

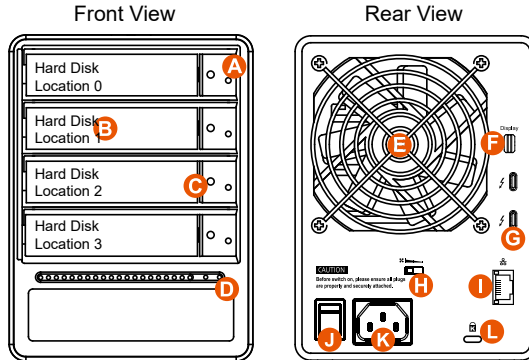
2. Product Appearance and Packaging Content

The following items should be inside the package upon opening:

ST4-TL3+
ST4-TL3+ product x1 (containing HDD enclosure x4)
Thunderbolt™ cable x1
Power cable x1
Handle x1
Quick Setup Guide x1
Screws and key

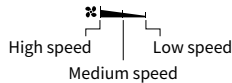
- Please check the product and accessories for any defect or missing parts. If you have any questions, please contact your product supplier.
- Please visit the [official website - Download page](#) to download drivers and other related resources.

Front and rear view



Note: A hard disk must be installed at HDD location 0

- | | | |
|--------------------------|----------------------|----------------------|
| A. HDD access light | E. Fan | I. 10Gb/s RJ-45 port |
| B. HDD enclosure handle | F. Mini DisplayPort | J. Power switch |
| C. HDD enclosure keyhole | G. Thunderbolt™ port | K. Power socket |
| D. Power status light | H. Fan speed switch | L. Anti-theft lock |



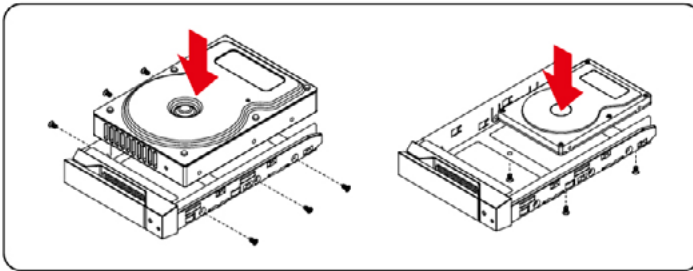
3. Hardware Requirements and Precautions

1. This system can only transfer data to one computer through one interface at a time.
2. Please make sure that the hard drives are free from bad blocks or defects prior to installation in order to avoid system crashes or data loss.
3. Whenever turning off or unplugging the ST4-TL3+ from your computer system becomes necessary, always remember to safely remove it from your operating system first.
4. When the ST4 is connected to the computer system, it's prohibited to remove, insert or swap the hard drive while data transfer is being performed.
5. The product needs to be restarted after adding or changing the RAID mode, and the update is guaranteed to be the new RAID mode.
6. If you will be incorporating either software or hardware RAID functionality to operate with the ST4-TL3+, it is important to understand the RAID level and its component that will be incorporated and the precautions to take as each RAID level and component may function differently and contains various limitations.
7. It is highly recommended for users to back up important data contained within the drives of the ST4-TL3+ on a regular basis or whenever the user feels necessary to a remote or a separate storage device. STARDOM will not be responsible for any lost of data caused during the use of the ST4-TL3+ or the recovery of the data lost.

4. Hardware Installation

Please follow the steps below to complete the hardware installation process:

- Step 1 When you open the package, please immediately check the product and included parts for any damage or missing parts. If there is a problem with the product or included parts please contact your supplier immediately.
- Step 2 Place the device on a flat, even surface. Make sure that the cooling fan is not blocked and there is sufficient surrounding space for cooling. (Keep away from water or other environments that may cause product damage)
- Step 3 Please insert the pin included with the parts pack into the keyhole to release the HDD enclosure handle and remove the HDD enclosure.
- Step 4 Place the hard disk in the HDD enclosure and secure it in place with the included screws; this will prevent damage to the hard disk from external vibration.



Note: Please avoid using hard disk drives from different manufacturers or different models from the same manufacturer as this may impact system performance.

- Step 5 Once the hard disk is installed, slide the enclosure into the system and close the handle.
- Step 6 Select the appropriate cable from the accessories pack depending on the interface. Connect the ST4-TL3+ backplate connection port to the corresponding port on the computer.
- Step 7 Connect the AC Power cable to the ST4-TL3+. Plug the connector into the power socket then start the system.
- Step 8 Your operating system will automatically detect available capacity once the device finishes booting. Once the device has been detected, please follow instructions given by the operating system and format the system. Once the hard disk has been formatted, the ST4-TL3+ can be used.
- Step 9 If the computer is unable to detect the system, please install the drivers from official website (www.STARDOM.com.tw)

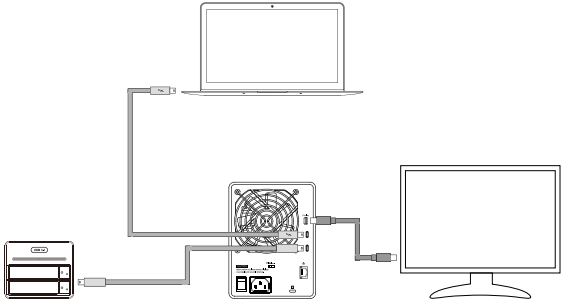
5. Connect with other devices

1. TB port: Thunderbolt™ 3 ports can be connected to TB3, USB3.1 and Display port device. It is downward to support USB3.0 / USB2.0. This product can connect with different USB devices by USB Type C to Type A/B cable. It supports TB port power delivery (PD) function, which can provide 15W (5V / 3A) power output to support 5V / 3A rechargeable notebook computer use. There is no additional power supply need.

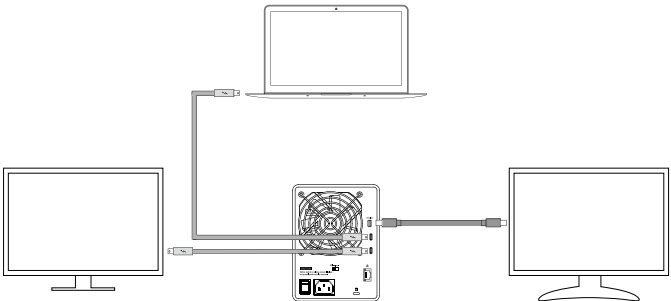
2. Mini Display port: configured with Mini Display Port connection port to provide additional screen output.
3. 10 Gbps RJ45 network connection: The Ethernet-equipped route allows a computer equipped with Thunderbolt™ 3 to use a high-speed network environment with up to 10 GbE.

Two System Connections:

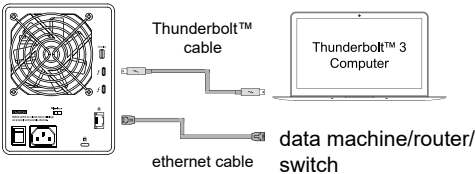
A. Let its TB A port connect to Host (PC/Workstation/Server), TB B port to other Device (USB or TB), and mDP (Mini Display) port to monitor.



B. Let its TB A port connect to Host (PC/Workstation/Server), TB B port to a monitor, and mDP port to the second monitor.



C. TB A port is connected to MB (Host), and RJ45 port is connected to modem/router/switch.



1. It is recommended to use a high-grade CAT-6A Ethernet route with a length of no more than 100 meters.
2. If you use a lower-level Ethernet route (such as CAT-6, CAT-5e), you should pay attention to the target speed and length limit.
3. Downward compatible with 5, 2.5, 1GbE and 100MbE Ethernet.

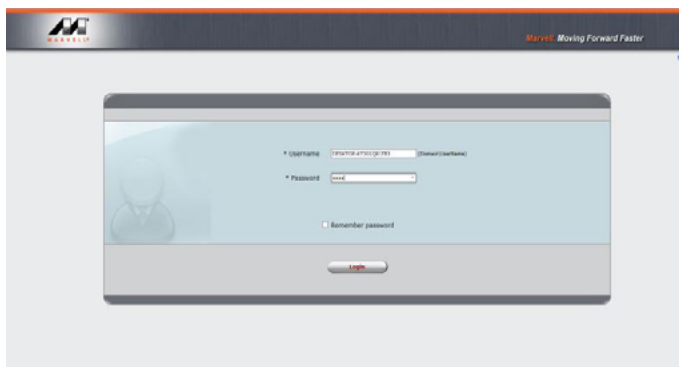
Speed	Compatible Cable
10 Gbps	CAT-6A (100m)
	CAT-6 (55m)
	CAT-5e (30m)
5 Gbps	CAT-6 (100m)
	CAT-5e (30m)
2.5 Gbps	CAT-5e (100m)
1 Gbps	CAT-5e (100m)
100 Mbps	CAT-5 (100m)

6. The MSU, and easy RAID configurator

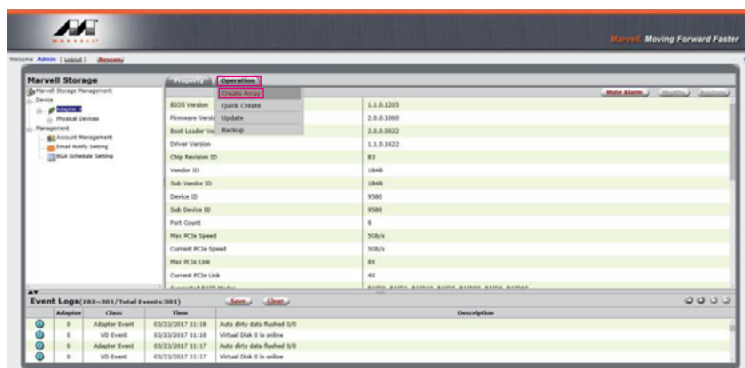
- JBOD: To use individual capacity of each installed HDD.
- RAID 0: Only enhances the performance of data accessing, it does not provide backup/fail-safe for stored data.
- RAID 1: Function provides fully automatic backup that ensures data security.
- RAID 10: It requires 4 hard disks and has the speed of RAID0 and the security of RAID1.

A. Set up RAID Mode(Taking RAID 0 as an example):

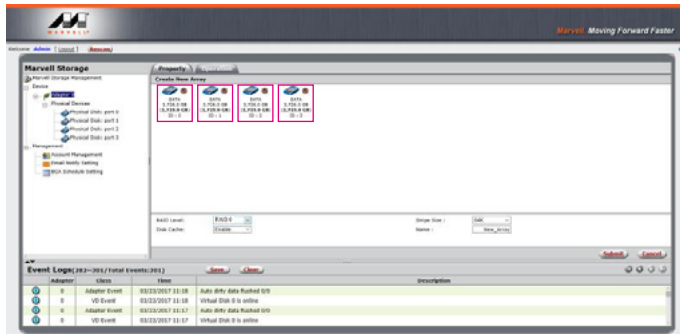
1. Use your Windows username and password to log into the MSU. If you have a username but no password, then leave the password field blank.



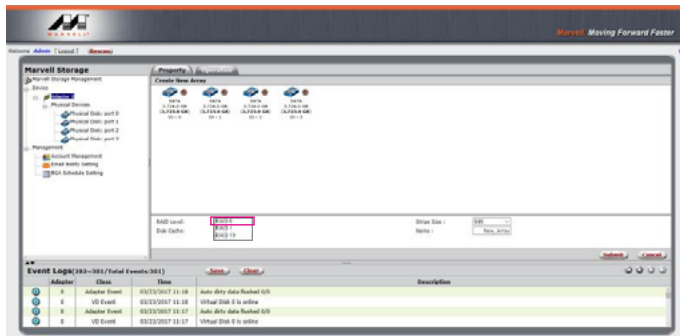
2. Click 【Operation】 and 【Create Array】.



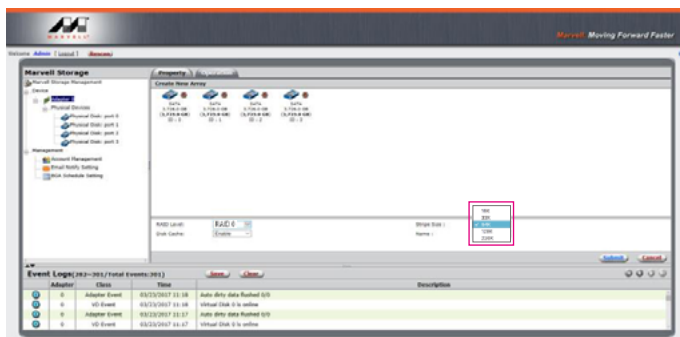
3. Click at the selected HDDs.



4. Select 【RAID 0】.

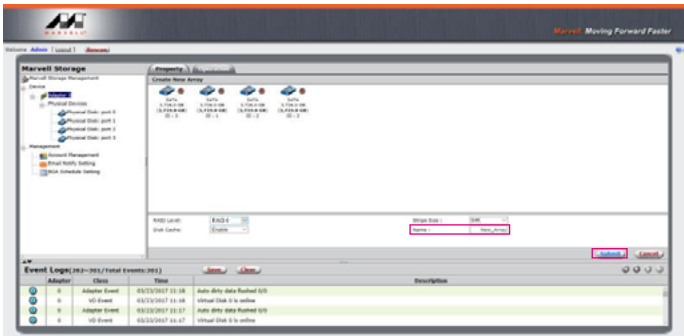


5. Setup Stripe Size.

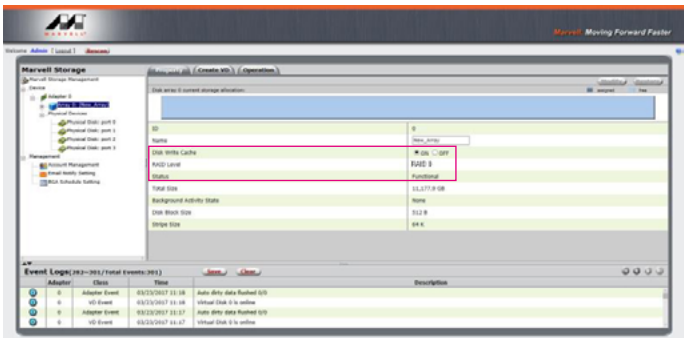


- The more Stripe Sizes helps a better data transfer for large data files which is good for video and audio editing works.
- The less Stripe Sizes helps a better efficiency at random files which is good for daily word processing, frequent read-&-write works.

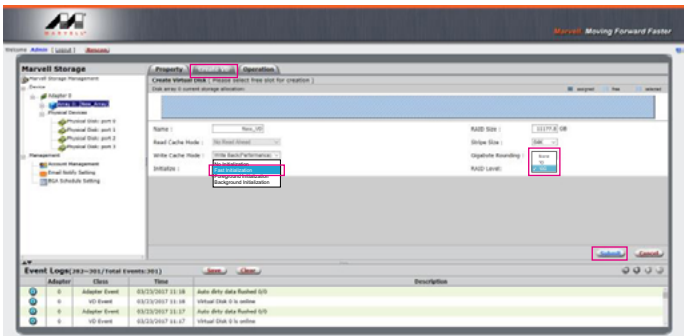
6. Type Storage Name and Submit RAID setting.



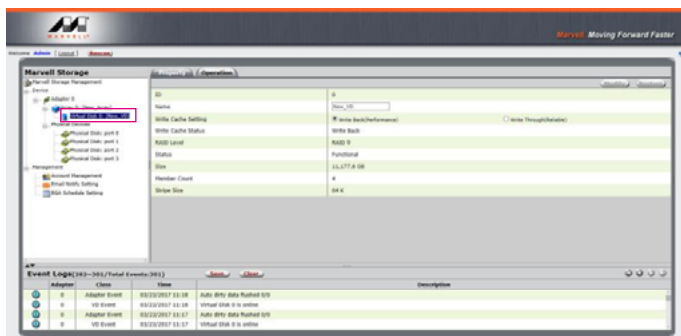
7. After submitting RAID setting:



8. Click 【Create VD】 , 【Initialize】 option is set to 【Fast Initialization】 ; 【Gigabyte Rounding】 options set to 【10G】 , then click 【Submit】 .

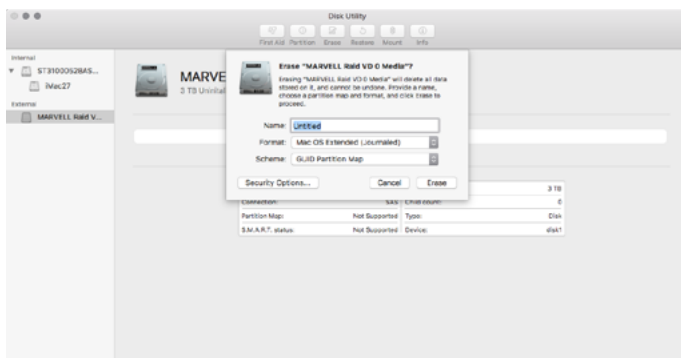


9. After submit, you get a New_VD.

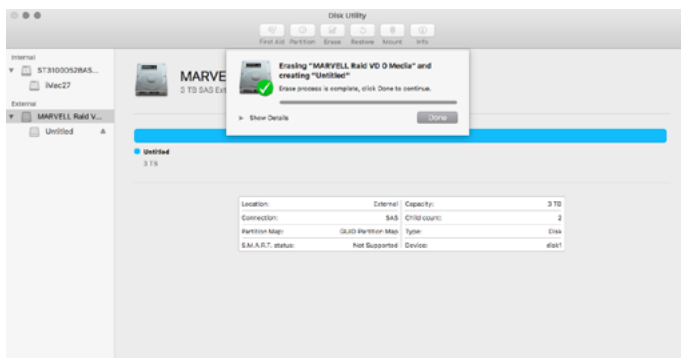


P.S. VD is the abbreviation of Virture Disk.

10. To initiate and format HDD/SSD at OS level.

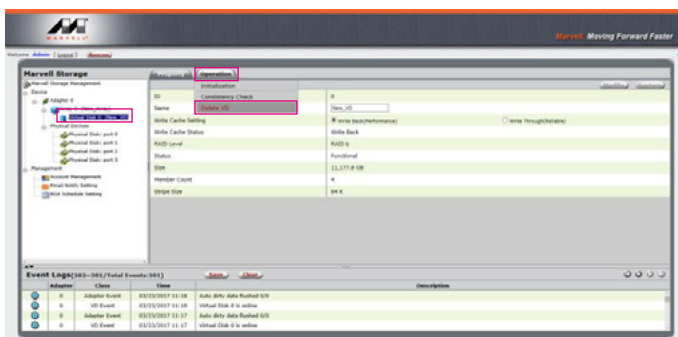


11. After completing the format, you could start using your ST4-TL3+.

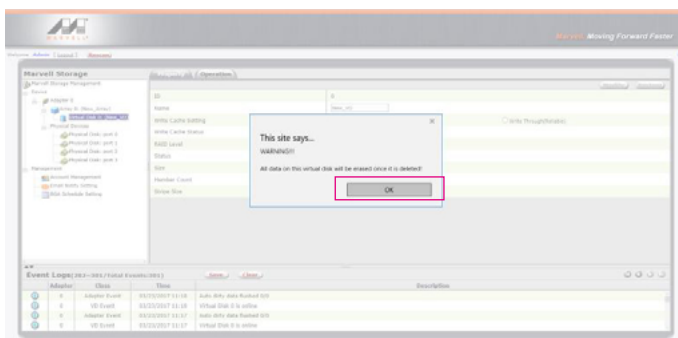


B. Delete a RAID for a new RAID setting

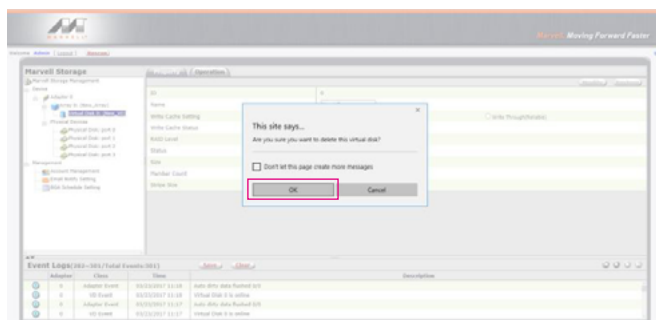
1. Click 【Operation】 and 【Delete VD】.



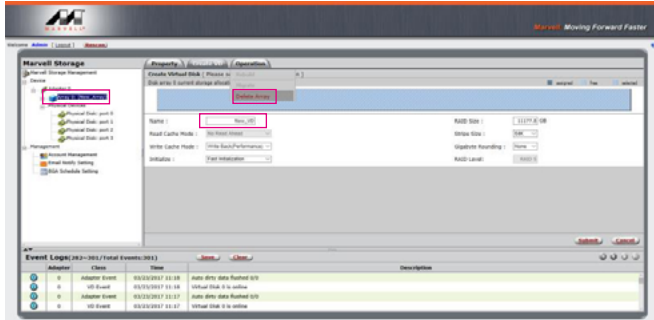
2. Click 【OK】 at first warning message.



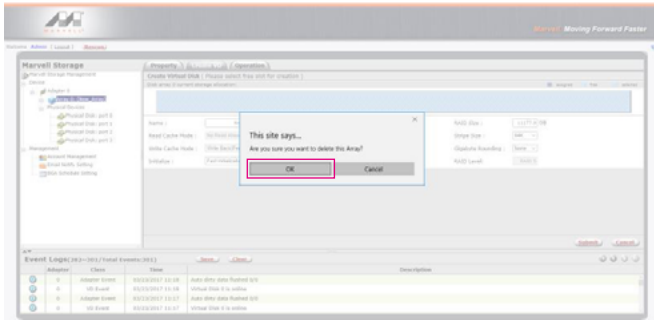
3. Click 【OK】 at the second warning message.



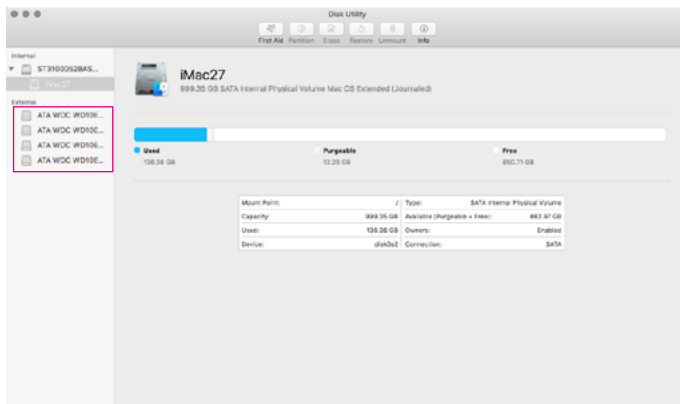
4. Click **【Operation】**, **【Delete Array】** and **【Submit】**.



5. Click **【OK】** at warning message.



6. It returns to JBOD mode, you just have to format every individual HDD or just to set up another RAID.



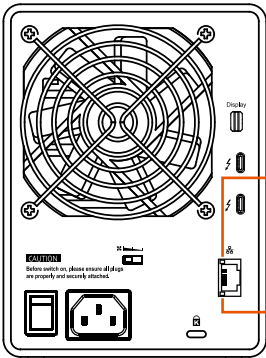
Please refer to "STARDOM All TB2&TB3 RAID 5 Storage MSU User Manual.pdf" for the RAID setting.

7. Description of HDD Indicators

System Indicator Light & HDD Status Light

Status	System Indicator Light	HDD Status Light
No HDD	Blue light always on	N/A
Data access	Blue light always on	Blue light flashing
HDD idle	Blue light always on	Blue light always on
Rebuilding data - Source HDD	Blue light always on	Blue light flashing
Rebuilding data - Target HDD	Blue light always on	Blue light flashing

Rj45 Ethernet Light



Green Light

- Always On — Network Connected
- Flashing — Network Access
- Off — Network Disconnection

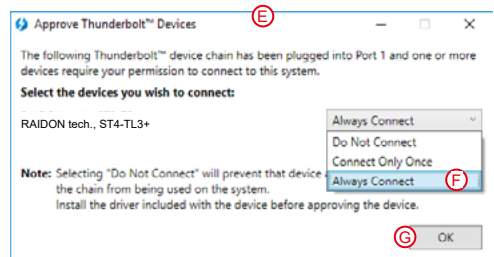
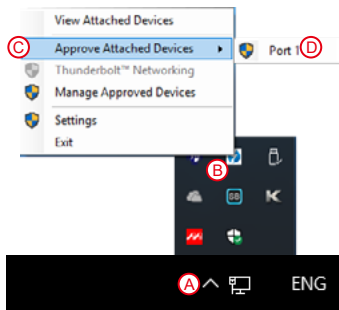
Green Light Always On — 10 G

Orange light Always On — 5G / 2.5G / 1G / 100 M

Off — Network Disconnection

8. Frequently Asked Questions

1. If the ST4-TL3+ is turned on, but the Thunderbolt™ cable is not connected, the fan and power status lights will both be in stopped/hibernation mode. The fan and power status light will not come on until the Thunderbolt™ cable is connected to the computer.
2. When the computer enters hibernation mode, the fan and power status lights will both be in stopped/hibernation mode. The fan and power status light will not come on until the computer is awake.
3. If a hard disk already contains data from another RAID product or RAID mode has already been set, we recommend reverting back to JBOD mode before the drive is used with the ST4-TL3+ again to avoid problems accessing the hard drive.
4. If the ST4-TL3+ is installed on the Windows OS but can not be connected, refer to the following steps:
 - A. Open the Windows Taskbar.
 - B. right-click the Thunderbolt™ icon.
 - C. Select "Approve Attached Devices".
 - D. Select the port to which the device is connected.
 - E. Wait for the dialog box "Approve Thunderbolt™™ Devices" to appear.
 - F. Select "Always Connect"
 - G. Press "OK" °

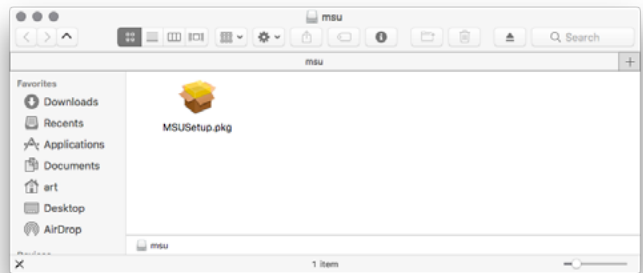


5. How to install software on macOS:

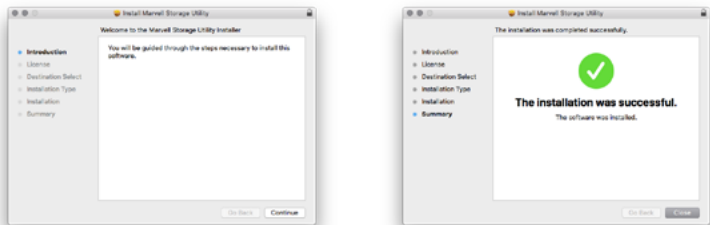
A. Unzip the downloaded tarball and execute msu.dmg.



B. Get the installation program MSUSetup.pkg, execute the program, and enter the installation process.

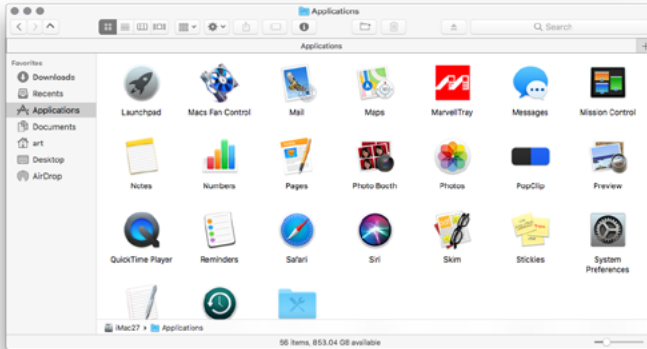


C. Follow the flow instructions and actual conditions to complete the installation.



6. There are three ways to start the program:

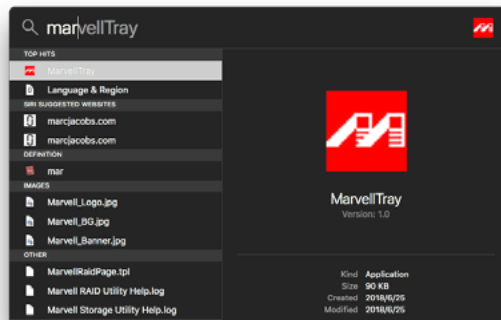
A. Find **MarvellTray** in the folder "Applications", hit the point and execute the program.



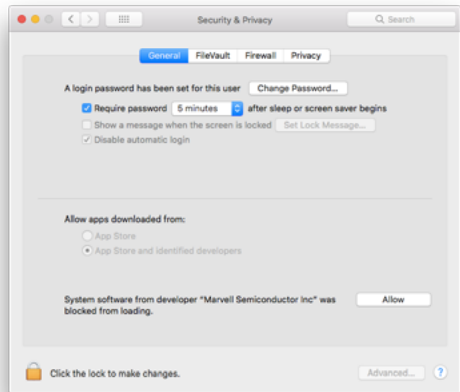
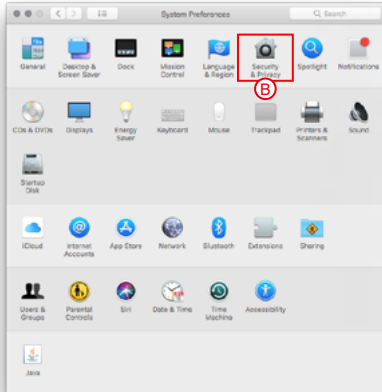
B. Hit the Launchpad on the Dock and hit the **MarvellTray** icon to execute the program.



C. Using Spotlight's search function, type **MarvellTray** to find the program and press Enter to execute the program.



7. The new macOS 10.13 (High Sierra) requires user approval before loading new, third-party kernel extensions:
- A. Execute **MarvelIMvumi.pkg**.
 - B. Appear from an unidentified developer warning, click on the lower right corner of the "OK."
 - C. Open **System Preferences**, and go to **Security & Privacy**.
 - D. Click on the "Allow" button.



Note: If you can not click the allow button, click the lower left corner of the lock icon, and enter the administrator password.

關於這份手冊

感謝您使用 STARDOM 的產品。本手冊將介紹 STARDOM ST4-TL3+ 產品。在您開始使用 STARDOM ST4-TL3+ 產品前，建議您先閱讀過本手冊。手冊裡的資訊在出版前雖已被詳細確認，實際產品規格仍將以出貨時為準；任何產品規格或相關資訊更新請您直接到 www.stardom.com.tw 網站查詢，本公司將不另行通知。若您想獲得 STARDOM 最新產品訊息、使用手冊、韌體，或對 STARDOM 產品有任何疑問，請您聯絡當地供應商或到 www.stardom.com.tw 取得相關訊息。

本手冊相關產品內容歸銳銳科技股份有限公司版權所有

1. 環境需求

工作溫度：0 ~ 40 °C (32 ~ 104 °F)

儲存溫度：-20 ~ 47 °C (-4 ~ 116 °F)

工作電壓：100 ~ 240V AC

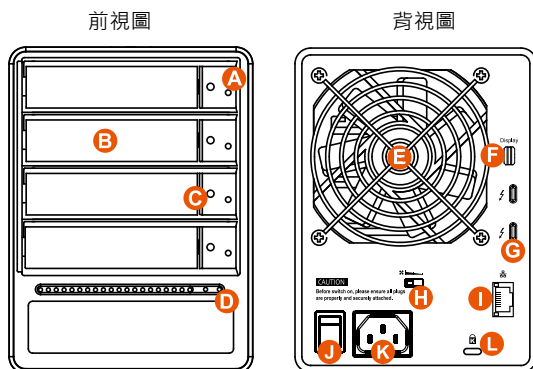
2. 產品外觀及包裝內容

打開包裝外盒後，包裝內容應包含下列組件：

ST4-TL3+
ST4-TL3+ 產品本體 x1(內含抽取盒 x4)
Thunderbolt™ 連接線 x1
電源線 x1
把手 x1
快速安裝導引 x1
螺絲及鑰匙

- 請確認相關配件與產品本身是否有受損或配件缺少，若有任何疑問請與本產品供應商聯絡。
- 請前往 [官網 - 產品資料下載頁面](#)，下載驅動程式以及其餘相關資源。

正面與背面示意圖



- A. 硬碟狀態指示燈
- B. 硬碟抽取盒把手
- C. 硬碟抽取盒鑰匙孔
- D. 電源指示燈

- E. 風扇
- F. Mini DisplayPort
- G. Thunderbolt™ 連接埠
- H. 風扇轉速切換按鈕

- I. 10 Gb/s RJ45 網路埠
- J. 電源開關
- K. 電源插座
- L. 防竊鎖孔



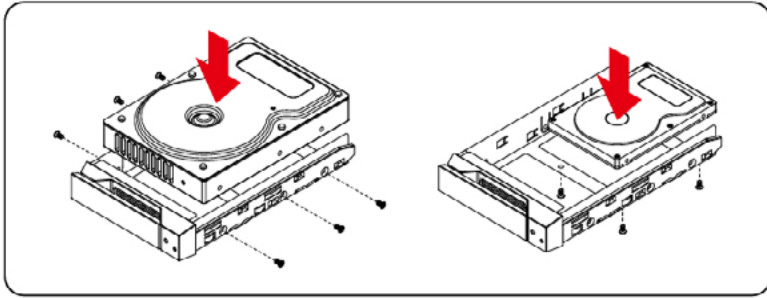
3. 硬體需求與注意事項

1. 本系統同一時間只可透過一組介面與一台電腦執行資料傳輸。
2. 在安裝新硬碟到 ST4-TL3+ 之前，請先確認硬碟是沒有壞軌而且是沒有故障的，以避免資料受損。
3. 當您需要關閉或移除 ST4-TL3+ 時，務必透過您所操作的作業系統中執行硬碟安全移除後，方可進行電源關閉的動作。
4. 當系統運作時，請勿任意移除任何一顆硬碟，以免導致資料遺失。
5. 在新增或變更 RAID 模式後需重新啟動產品，以確保完成更新為新的 RAID 模式。
6. 如你希望將 ST4-TL3+ 搭配軟體或硬體 RAID 功能使用時，請先瞭解並注意你所要使用 RAID 層次及配件的特性與限制。
7. 強烈建議除了使用 ST4-TL3+ 的資料儲存功能外，請針對重要資料備份到另一個儲存裝置上或遠端備份，雙重備份您重要的資料。若您儲存在 ST4-TL3+ 的資料損毀或遺失，STARDOM 將不負任何的責任。

4. 硬體安裝

請參照以下步驟完成硬體安裝

- 步驟 1 當你打開包裝後，首先請先檢查產品主體以及附件是不是有毀損或是短缺情形，如果發生產品主體及附件短缺，請立刻與您的供應商聯絡。
- 步驟 2 將主機置放於平穩空間上，並確認散熱風扇沒有被擋住，且四周有適當的散熱空間。（請避免接近水源或是其他容易造成產品損傷的環境）
- 步驟 3 請使用零件包中所附的頂針插入鑰匙孔，開啟硬碟抽取盒把手便將抽取盒取出。
- 步驟 4 將硬碟安裝到抽取盒上，並以零件包內附的螺絲加以固定，以避免不必要的移動對硬碟造成傷害。



注意：不建議使用不同廠牌，或是同廠牌不同型號的硬碟，避免影響效能。

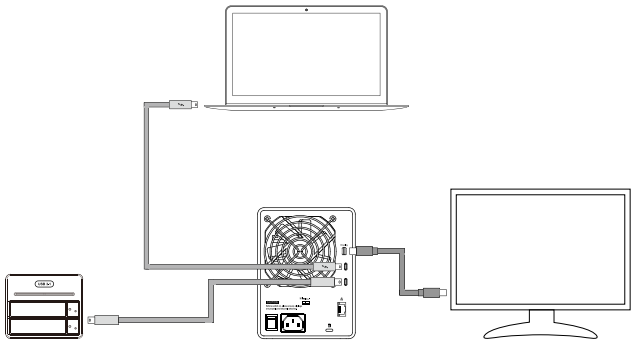
- 步驟 5 硬碟安裝完成後，請將抽取盒平移放入主機內，並關上把手。
- 步驟 6 請依據您欲使用的介面，從附件包中選擇相對應的連接線，將 ST4-TL3+ 背面連接埠與電腦主機相對應介面埠連接。
- 步驟 7 AC Power 電源線與 ST4-TL3+ 連接好，並將接頭接上電源插座後開機。
- 步驟 8 開機後，您的作業系統將會自動辨識到儲存容量；待辨識成功後，請依據您所需的儲存格式，將系統依照作業系統的指示完成格式化。待硬盤格式化完成後，便可直接使用 ST4-TL3+。
- 步驟 9 如電腦無法辨識此一系統，請前往官網 (www.STARDOM.com.tw) 下載驅動程式並安裝。

5. 與其他裝置連接說明

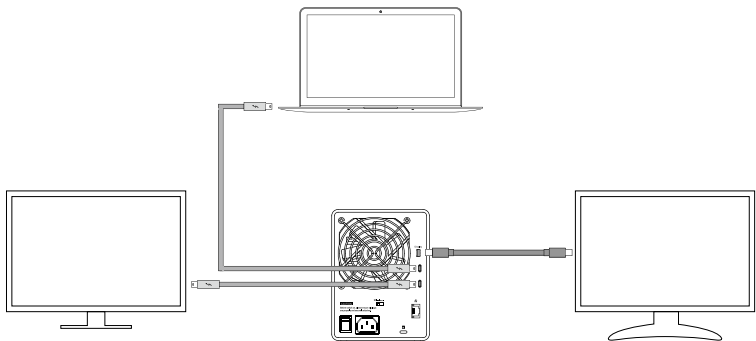
1. TB port : Thunderbolt™ 3 連接埠可串接 TB3、USB 3.1 和 DisplayPort 裝置；其中向下支援 USB3.0/USB2.0，有轉接線即可連接不同規格之 USB 產品，本產品支援 TB port 供電功能 (PD)，可以提供 15W (5V/3A) 的電源輸出給支援 5V/3A 充電的筆記型電腦使用，不用額外連接電源。
2. Mini DisplayPort : 配置 Mini DisplayPort (mDP) 連接埠，支援額外的螢幕輸出。
3. 10 Gbps RJ45 網路連接埠：透過乙太網路線可讓配置有 Thunderbolt™ 3 的電腦具備使用最高達 10 GbE 的高速網路環境。

裝置連接示意圖：

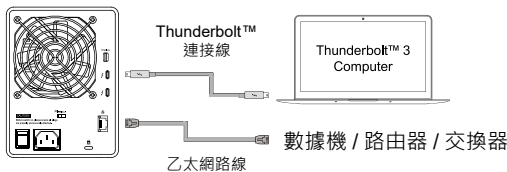
A. TB A port 接 MB (Host) · TB B port 接 other Device (USB or TB) · mDP 接螢幕。



B. TB A port 接 MB (Host), TB B port 接螢幕, mDP 接螢幕 (雙螢幕)



C. TB A port 接 MB (Host) · RJ45 port 接數據機 / 路由器 / 交換器。



1. 建議使用高等級的 CAT-6A 乙太網路線，其長度不超過 100 公尺。
2. 若使用等級較低的乙太網路線（如 CAT-6、CAT-5e），則需注意目標速度與長度限制。
3. 向下相容 5、2.5、1GbE 以及 100MbE 乙太網路。

網路速度	相容傳輸線
10 Gbps	CAT-6A (100m)
	CAT-6 (55m)
	CAT-5e (30m)
5 Gbps	CAT-6 (100m)
	CAT-5e (30m)
2.5 Gbps	CAT-5e (100m)
1 Gbps	CAT-5e (100m)
100 Mbps	CAT-5 (100m)

6. MSU 簡易設定

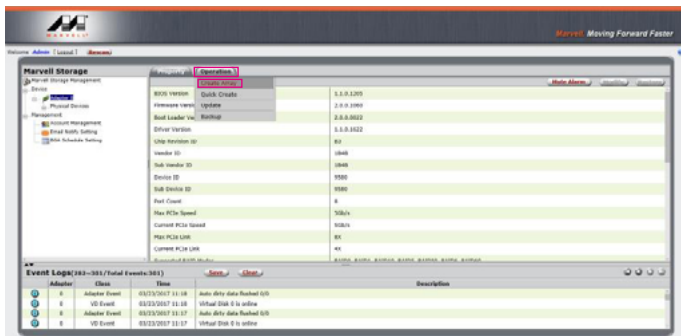
- JBOD：各別使用用置入的硬碟存取空間。
- RAID 0：僅加速資料存取速度，對於資料備份不作任何保障。
- RAID 1：全自動備份，確保資料安全。
- RAID 10：需要 4 台硬碟，同時具有 RAID0 的速度及 RAID1 的安全性。

一、建立 RAID 模式（以 RAID 0 為例）：

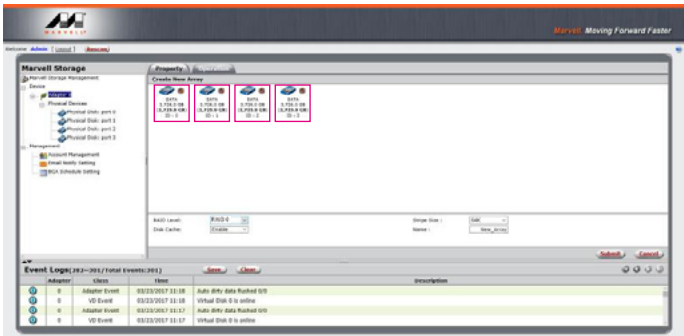
1. 開啟 MSU 程式進入登錄頁面，使用 Windows 或 Mac 帳戶及密碼登錄進入 MSU。若有帳戶卻無密碼，請將 MSU 登錄密碼處維持空白。



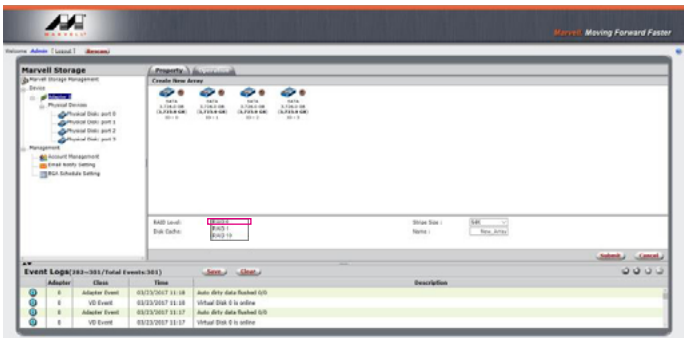
2. 點擊【Operation】與【Create Array】。



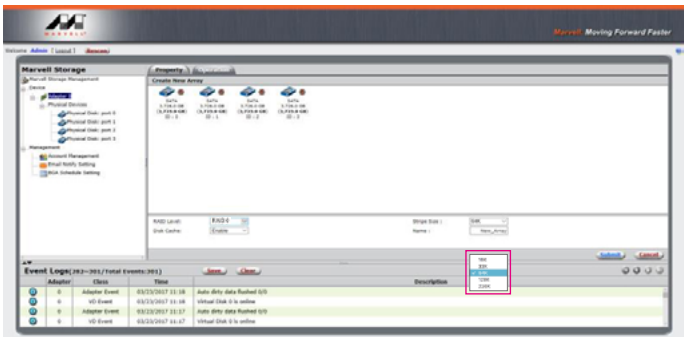
3. 點擊選擇硬碟。



4. 選擇【RAID 0】

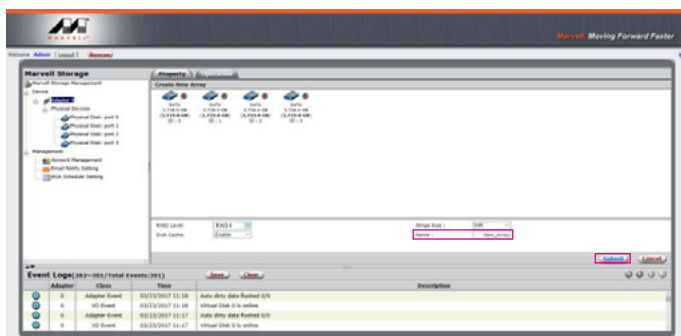


5. 設定 Stripe Size

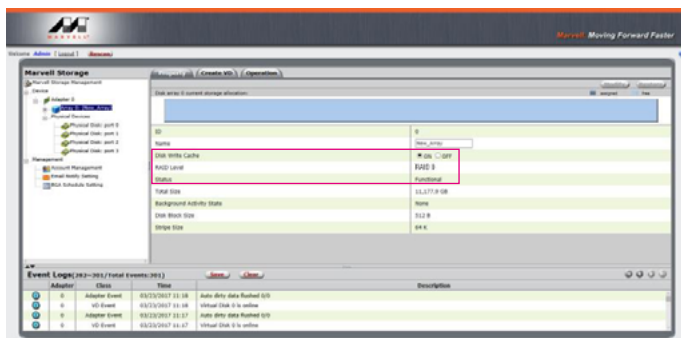


數值越大，大量傳輸資料的效能越好（如圖像編修、影音編輯等）；
數值越小，隨機讀寫越快（如程式啟動、文書處理、系統頻繁讀寫等）。

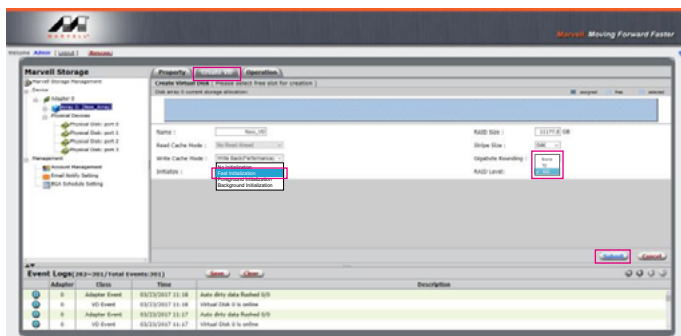
6. 輸入存儲名稱，再點擊【Submit】，提交 RAID 設置。



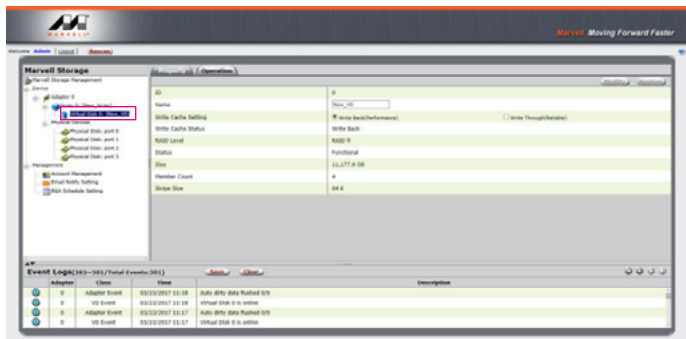
7. 提交 RAID 設置後的回饋如下：



8. 點擊【Create VD】，將【Initialize】的選項設定為【Fast Initialization】；將【Gigabyte Rounding】的選項設定為【10G】，再點擊【Submit】。



9. 提交後，您將獲得一個 New_VD。



P.S. VD 為虛擬磁碟 virtual disk 的簡稱

10.於作業系統進行初始化硬碟的設定。

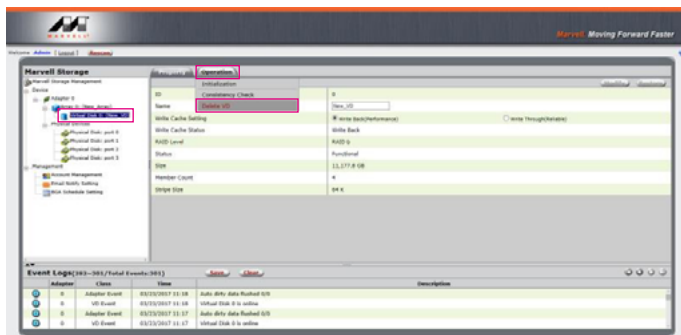


11. 格式化之後，即可開始使用。

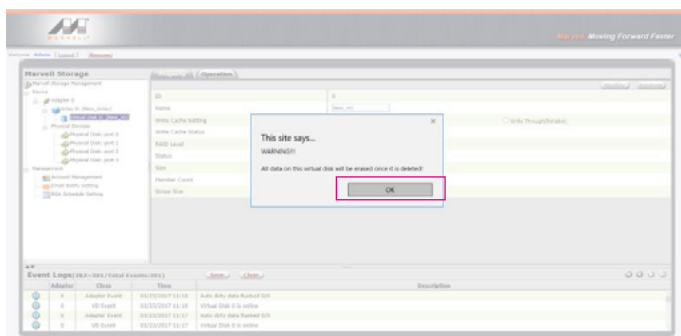


二、移除 RAID 模式：

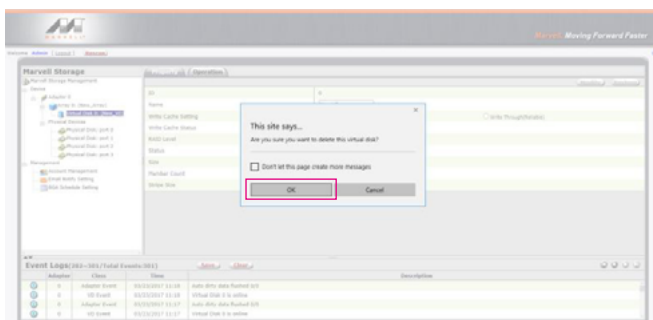
1. 點擊【Operation】與【Delete VD】。



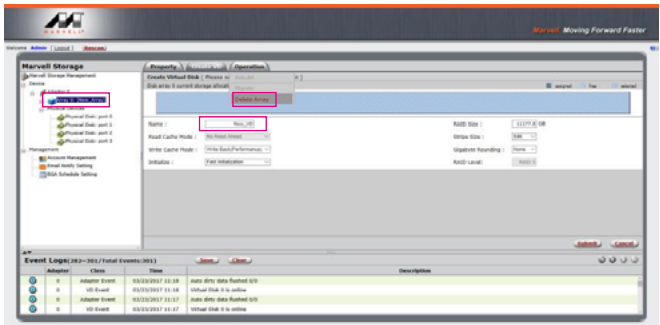
2. 在第一條警告消息中點擊【OK】。



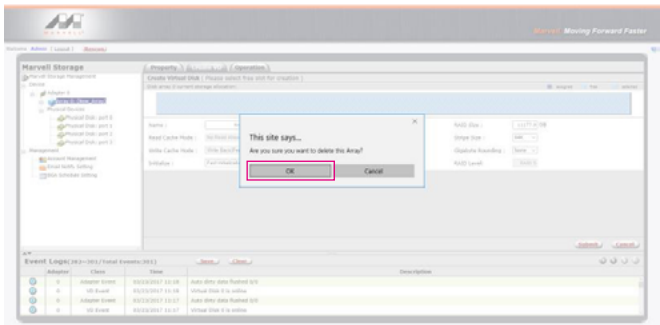
3. 在第二條警告信息中點擊【OK】。



4. 點擊【Operation】、【Delete Array】與【Submit】



5. 在警告信息中點擊【OK】。



6. 磁碟系統轉為 JBOD 模式，之後只需要個別格式化硬碟，或設置新的 RAID 模式。



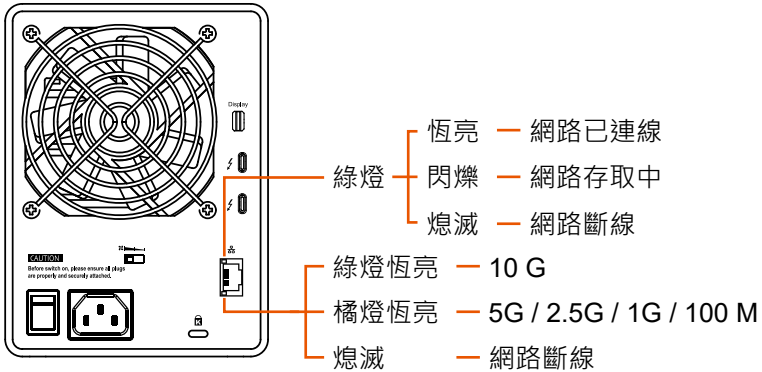
更詳細的 RAID 設定方式請參閱 STARDOM All TB2&TB3 RAID 5 Storage MSU User Manual.pdf

7. 燈號說明

電源指示燈與硬碟狀態燈

狀態	電源指示燈	硬碟狀態燈
無硬碟	藍燈恆亮	N/A
資料存取	藍燈恆亮	藍燈閃爍
硬碟閒置	藍燈恆亮	藍燈恆亮
資料重建 - 來源碟	藍燈恆亮	藍燈閃爍
資料重建 - 目標碟	藍燈恆亮	藍燈閃爍

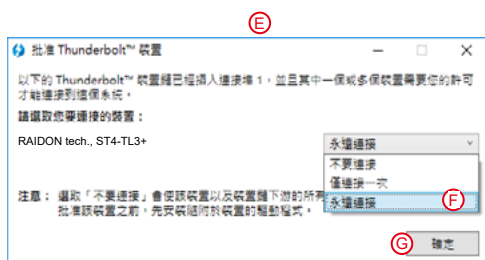
RJ45 網路連接埠燈號



8. 常見問題

1. ST4-TL3+ 在開機情況下，未連接 Thunderbolt™ cable 時，風扇與電源指示燈皆為停止及休眠狀態，直至連接 Thunderbolt™ cable 至電腦才會啟動風扇及電源指示燈。
2. 電腦進入睡眠模式時，ST4-TL3+ 的風扇與電源指示燈皆為停止及休眠狀態，直至喚醒時才會啟動風扇及電源指示燈。
3. 若硬碟已在其他磁碟陣列產品存取資料或設定 RAID MODE 過，建議還原成 JBOD 模式後再應用於 ST4-TL3+，以避免產生無法讀取硬碟問題。
4. 若 ST4-TL3+ 裝設在 Windows 作業系統上卻無法連線，請參考下方步驟：

- A. 開啟右下角工作列圖示
- B. 在 Thunderbolt™ software 圖示上擊點滑鼠右鍵
- C. 選擇「批准已接上的裝置」
- D. 選擇連接埠
- E. 等候對話框「批准 Thunderbolt™ 裝置」出現
- F. 選擇「永遠連接」
- G. 按下確定。

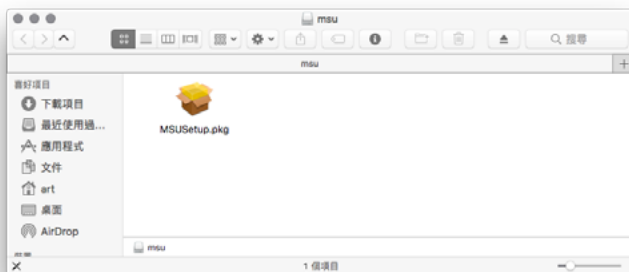


5. 如何在 macOS 安裝軟體：

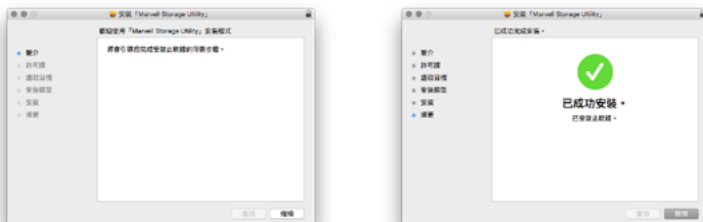
A. 將下載的壓縮檔解壓縮後，執行 msu.dmg。



B. 得到安裝程式 MSUSetup.pkg · 執行該程式，進入安裝流程。

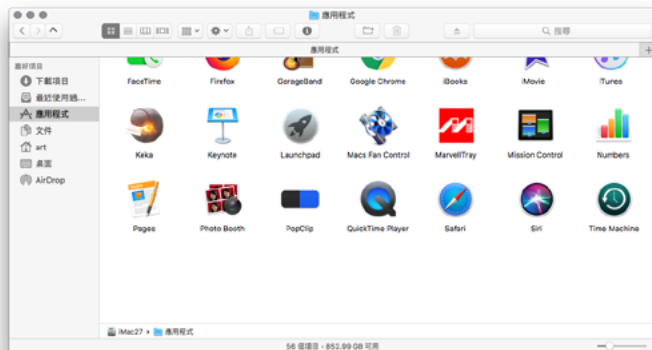


C. 依照流程指示與實際狀況選擇，以完成安裝。



6. 啟動程式的方式有三：

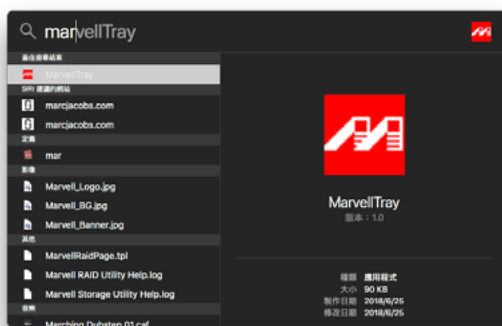
A. 在資料夾「應用程式」內找到 **MarvellTray**，擊點並執行程式。



B. 擊點 Dock 上的 Launchpad，擊點 **MarvellTray** 的圖示便能執行程式。

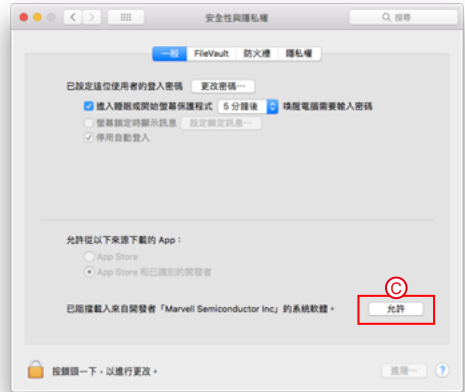
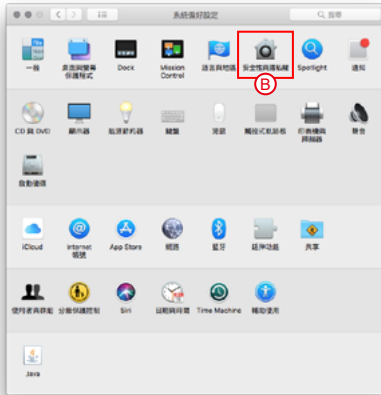


C. 利用 Spotlight 的搜尋功能，輸入 **MarvellTray**，便能找到程式，按下 Enter 就能執行程式。



7. 礙於 macOS 10.13 (High Sierra) 的權限設定，如果程式來自於未識別開發者，是無法直接安裝的。請依照下列步驟進行安裝：

- A. 執行 MarvellMvumi.pkg，出現來自未識別開發者的警訊，先點選右下角的「好」。
- B. 進入「系統偏好設定」後，點選「安全性與隱私」功能。
- C. 接著下方就會看到被阻擋的訊息，按旁邊的「允許」。



注意：如果無法擊點允許按鈕，請先擊點左下角的鎖頭圖示，並輸入管理員密碼。



<http://www.stardom.com.tw/>

