QNAP

Discover the all-new CacheMount

The key to make NAS a hybrid cloud server

Will be released in QTS 4.4.1

Coming soon!
Discover the all-new CacheMount

1. Why CacheMount and what are its problem solving abilities
2. Cache function makes the hybrid cloud more efficient
3. The key of CacheMount: Cache Volume
4. User manual on how To Start The Cache Experience
5. Live demo
Issues you might encounter while using **Private cloud**

- When out of office, it is too slow to access the data in the NAS due to **network issues**.
- It is slow to synchronize data between different NAS in multiple site office.

Issues you might encounter while using **Public cloud**

- It is too slow to access the data in the cloud due to **network issues** in different location.
- It is slow to connect to the same cloud between in multiple site office.
Hybrid Cloud Solution Embrace The Advantages of Both

• Security
• Storage extension
• Access Speed
• Powerful computing
• Access anywhere

Hybrid cloud solution is one of the best choice of the enterprise! Keep the old service investment and get the elasticity advantage!
The previous QNAP Hybrid Cloud Solution is…

Mount the cloud storage through Connect to Cloud Drive.
You can not access data through SMB/ AFP!

Synchronize data through Hybrid Backup Sync.
You can access data through SMB/AFP,
but it takes same capacity as the cloud use in NAS!
Now QNAP gives you
A New Hybrid Cloud Solution:
CacheMount

Allocate a part of NAS storage to enjoy the hybrid cloud!
Enjoy QTS applications at the same time.

SMB/NFS/AFP
CacheMount
Cache function makes the hybrid cloud more efficient
A New Hybrid Cloud Solution: CacheMount

Remote Mount & Connect to Cloud Drive

NAS as the edge gateway device to the cloud

CacheMount
New service in QTS 4.4.1

After upgrading the firmware to QTS 4.4.1, CacheMount will replace Connect to Cloud Drive. Please install CacheMount in App Center.
CacheMount Cloud Gateway

5 features to increase cloud management

- Support 2 types, 20 cloud providers.
- Much more smoothly access cloud data.
- Access through SMB/AFP. No need PC utility for cloud service anymore.
- Share and manage files between multiple site office in time.
- Horizontally integrate QTS applications to use the cloud data.
Support 2 types, 20 cloud providers.

<table>
<thead>
<tr>
<th>Type I: File-base Storage</th>
<th>Type II: Object-base Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Storage data by the folder structure.</td>
<td>• Storage unstructured data in the flat environment.</td>
</tr>
<tr>
<td>• Pricing depending on the fixed capacity.</td>
<td>• Pricing depending on the actual storage usage.</td>
</tr>
</tbody>
</table>
CacheMount can transform the unstructured data into file structure for easy management of object cloud storage spaces.
Why you should use object storage service?

**Data backup and disaster recovery**
It enables you to store, back up, archive large amounts of data in the cloud and also help with disaster recovery.

**Highly scalable and elastic**
It can store enormous data and price by the actual storage usage.

**Various computing service**
Cloud vendors provide various computing such as big data analytics.
Smother access to cloud data

Remote Mount-Basic Function

Manage multiple cloud services in File Station.

With CacheMount, you can...

1. Create a more compact hybrid cloud with smoother data access.
2. Access through SMB/AFP. No need PC utility for cloud service anymore.
Access through SMB/AFP

File Station

Local Storage

Remote NAS

Cloud Storage

Mount on PC by network protocol

PC (mounting through Samba)
Share and manage files between multiple site office in time

Remote Mount-Basic Function

No matter how large the file is, file transfer across NAS can be fast.

With using cloud service, files sharing and management between multiple site office can be on time.

With CacheMount, you can...
Horizontal integrate QTS applications to use the cloud data

Remote Mount-Basic Function

File Station

The remote data can be managed only in File Station. Other application can not access data on the cloud.

With CacheMount, you can:

Have a same multimedia experience of data in different cloud service.

Search enormous files on the cloud fast and easily.
CacheMount Features
Enable Cache To Have Better Cloud Experience

Basic Functions

- **Remote Mount**
  Remote Device: Through CIFS/SMB, FTP, WebDAV
  Cloud Service: 2 types, 20 cloud providers

- **Manage Remote Data**
  Only be able to operate files in File Station

- **Manage Multiple Clouds**

NEW!! Enable Cache

- **Access Files Smoothly**
  Cache function let file access more smooth

- **Operate Cloud Data by PC**
  PC can access cloud directly through SMB/AFP

- **Cloud data usage**
  Enjoy various applications in QTS including file manager and multimedia services
Purchase License for CacheMount Solution

Install CacheMount and Enjoy one free and perpetual license.

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CacheMount – 1 connection/year</td>
<td>US $ 19.9</td>
</tr>
<tr>
<td>CacheMount – 4 connections/year</td>
<td>US $ 59.9</td>
</tr>
<tr>
<td>CacheMount – 8 connections/year</td>
<td>US $ 99.9</td>
</tr>
</tbody>
</table>

To keep maintain and support every cloud services and provide you the best service. We charge for more cache connection.
View License Status Anytime

View the usage of license

<table>
<thead>
<tr>
<th>License Name</th>
<th>License ID</th>
<th>Status</th>
<th>Apply Date</th>
<th>Valid Until</th>
</tr>
</thead>
<tbody>
<tr>
<td>CacheMount</td>
<td>Free License</td>
<td>Valid License</td>
<td>--</td>
<td>Perpetual</td>
</tr>
<tr>
<td>CacheMount</td>
<td>5c458066055a536d...</td>
<td>Valid License</td>
<td>2019/01/21</td>
<td>2020/01/21</td>
</tr>
</tbody>
</table>

Note the valid time
CacheMount
The key of CacheMount: Cache Volume
Create a proper size of cache volume to help smoothly access unlimited cloud storage like local transferring.

First Step To Enable Cache: Create a Cache Volume

Minimize space: 200GB
Sync Metadata To Read File List Fast

Mount and then use

With cache function, you can view all file list and operate files without download all cloud data to the local NAS.

File list synchronization

- File-base storage service: synchronize anytime
- Object-base storage service: synchronize by schedule or manually.
  *HiDrive, Yandex and Sharefile will synchronize by schedule or manually.

Create a file list by the metadata.
Accelerate When ReadingCached Files

1. When first reading, the file will be downloaded from the cloud to the local cache volume and kept.

2. When reading the cached files, it will read the files in local cache volume to avoid download again.
Cache Uploading Files To Reduce Waiting Time

When uploading data to the cloud

Upload the files to NAS through LAN and then upload to the cloud in the background. It helps you reduce waiting uploading in front of your computer.
How Does The Cache Algorithm Work

When cache volume is full and there is more file space needed, the system will remove the least recently used file and only keep its metadata.

When downloading or uploading files, the system can optimize data reading and writing.

- **Cached data**
- **Reading data**
- **Writing data**
- **File metadata**

NAS cache volume
How To Configure The Cache Volume

Space

- To meet upload / download request, you need to create at least 200GB cache volume.
- Adjust space by your need. The larger space can store more cached data.

More Upload Request
A larger cache volume is needed to keep more uploading data.

More Download Request
Only need proper space. The space can be reused by removing the cached data.

Volume

Static Volume
Create the file system directly on the disk to have better read / write performance (20% better than other volume type).

Thick Volume
Create volume in the storage pool. The volume can be resize for elastic use.

Expand your NAS storage by TR-004.
Accelerate With Qtier And SSD Cache

SSD cost too much?

Use SSD and HDD with Qtier and SSD cache.

SSD Cache
- Cache but not store data
- Fixed bypass options

Qtier 2.0
- Tier can store data.
- IO Aware and Tiering On Demand

Application Layer
- SSD
- HDD
- Sequential
- Random

Accelerate With Qtier And SSD Cache

<table>
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<tr>
<th>SSD Cache</th>
<th>Application Layer</th>
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<td>• Cache but not store data</td>
<td>SSD Cache</td>
</tr>
<tr>
<td>• Fixed bypass options</td>
<td>Qtier 2.0</td>
</tr>
</tbody>
</table>

Use SSD and HDD with Qtier and SSD cache.

TIP 2
CacheMount As a Best Bridge To The Cloud

Cloud Service
- Object-base storage service
- File-base storage service

Data Usage
- NAS Applications
  - File management, editing, multimedia services
- Network Protocol Access
  - Samba, NFS, FPT, AFP, WebDAV

CacheMount
- User Interface
- Cache Volume
  - Metadata
  - Cached Data
  - Cache Algorithm
- File System
- Storage & Snapshot
  - User Interface
## Test Result To The Cache Function

### Speed of downloading a large file (511 MB)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Speed</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cached</td>
<td>32.38 MB/s</td>
<td>9.6 time faster</td>
</tr>
<tr>
<td>Not Cached</td>
<td>3.38 MB/s</td>
<td></td>
</tr>
</tbody>
</table>

### Speed of download 500 small files (522 MB in total)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Speed</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cached</td>
<td>31.26 MB/s</td>
<td>34.7 time faster</td>
</tr>
<tr>
<td>Not Cached</td>
<td>0.90 MB/s</td>
<td></td>
</tr>
</tbody>
</table>

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**Test Condition:**
- NAS Model: TS-1685 (CPU: Intel(R) Xeon(R) CPU D-1521 @ 2.40GHz, RAM: 16GB)
- 200 GB Cache Volume: Thick volume in RAID 1 storage pool (HDD*2/SSD*1, enable Qtier)
- Cloud Service: AWS S3

**Test Method:** Mount the same cloud bucket, and download the cached file and the file without cache separately.

*Test in QNAP LAB, the test result will differ based on the network speed and cloud services.*
CacheMount
(take Amazon S3 as the example)
4 Ways To Enjoy Cache Experience

1. 3 steps to create cache connections
2. 4 tips to manage cache connections
3. Visible usage status of cache volume
4. User Whitelist for CacheMount
3 Steps To Create Cache Connections

1. Create cache volume
3 Steps To Create Cache Connections

2 Mount the cloud storage

Step 1: Select a cloud provider (take AWS S3 as the example)

Step 2: Make configuration

1. Enter account information
2. Select a bucket
3 Steps To Create Cache Connections

3 Enable Cache

Method 1: In the step of creation wizard

Method 2: In Mounting Storage page
4 Tips To Manage Cache Connections

1. View all connections status

- **Mounting**: after creating, wait to be successfully mounted
- **Mounted**: successfully mounted and ready to access
- **Failed to Connect**: failed to connect to the cloud temporarily
- **Disabled**: disabled manually
- **Invalid**: configuration invalid and need to remount
4 Tips To Manage Cache Connections

2. Speed test helps to select a bucket

Test the upload and download speed to the specific connection.

Take Amazon S3 as the example:
Bucket can be created in any region. Select a bucket with higher speed by testing the speed from your place.

Test Time: 2019/01/21 14:07:51
Upload: 13.54 MB / Download: 14.77 MB
Customize cache folders to wisely use cache volume.

We suggest lowering the priority of infrequently used folders to efficiently use the cache volume.
Scheduled updates for file list

Enable scheduled updates for file metadata to control the cost from cloud request.

We suggest you only update in the time period you access frequently.

Upload settings for edited files

Select whether system checks the file version on the cloud or not when the file is edited in local to prevent accidental overwriting of files. Also help to control the cost from cloud request.

We suggest you not to check the cloud if you only access the cloud with one CacheMount connection.

4 Tips To Manage Cache Connections

4 Manage cost of object storage service
Visible Usage Status of Cache Volume

Use the usage status to help adjustment

Real-time Status

Ratio of local writing cache storage

The ratio is set to maintain a fixed storage ratio to avoid the sudden huge writing data ruling out the cache data.

We suggest you to adjust by the experience.

History Record
How To Manage The Cache Volume?

Frequently insufficient space may reduce cache efficiency

**Situation 1**
- Insufficient writing cache with sufficient free cache space.  cannot upload files
- Suggest to higher the local writing cache ratio.

**Situation 2**
- Insufficient writing cache free cache space.  cannot upload and download files
- Suggest to expanse cache volume.

**Situation 3**
- Insufficient reading cache space.  cannot upload and download files
- Suggest to expanse cache volume.
### User Whitelist for CacheMount

**Permissions**

Allow only the following users to use CacheMount:

- [ ] Administrator
- [ ] Administrator group
- [x] Specific users

#### Specific Users

<table>
<thead>
<tr>
<th>Username</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>administrator</td>
<td></td>
<td>Enabled</td>
</tr>
<tr>
<td>admin</td>
<td></td>
<td>Enabled</td>
</tr>
<tr>
<td>Josh</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CacheMount**

- Overview
- Mounting Storage
- Logs
- Mounting Logs
- Speed Test Logs
- Event Logs
- Caches
- Licenses
- Permissions
Demo Environment:
NAS Model: TBS-453DX
RAM: 8GB

Storage Pool: 256GB M.2 SSD *4, RAID 5
CacheMount Cache Volume: 200GB Thick Volume
Location: QNAP Headquarter in Taipei, Taiwan
A New Hybrid Cloud Solution: CachMount

Support 20 Cloud Services

File-based Storage

Object-based Storage

4 New experiences

Cache Function:
More smoothly access

PC can access cloud storage through SMB/AFP

Share files between multiple site office on time

Horizontal integrate QTS APPs to use cloud data