

Mobi	le Stora	age Sc	olution
User	Guide		

**T-Systems International GmbH** 

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### 1 OVERVIEW

### 1.1 Problem Statement

Moving use-cases and business processes from on-premise, dedicated IT solutions towards public cloud services is resulting in a lot of new challenges. One of them is moving large amounts of data from traditional IT environments into the cloud, especially Object Storage environments.

It is technically possible to use the default public internet access or dedicated private connections like MPLS or Ethernet Connect to copy the data towards the OTC object storage, but the required bandwidth might not be sufficient to copy the huge amount of data towards the DCs in Magdeburg / Biere.

### 1.2 Solution Option

T-Systems offers its customers a Mobile Storage Solution to move data from their Datacentre towards the Open Telekom Cloud based on Synology NAS devices.

The NAS devices will be provided by T-Systems to the customer who copies the data secured by the Synology Operating System onto the NAS that will be then sent to the Datacentre in Biere. The NAS will then be connected to the OTC infrastructure and the customer will be able to copy the data towards the object storage using a high bandwidth in the Biere LAN.

### 1.3 Feature List

- Customers can order NAS devices that are preconfigured by T-Systems and can be used as mobile storage devices
- Mobile storage devices can be ordered for a single data transfer or for permanent usage by dedicated customers.
- Data on mobile storage devices will be encrypted based on share level with encryption keys.
- Data on mobile storage devices is always secured against data loss by RAID functions.
- Mobile storage devices can be accessed using the SMB V2 and V3 protocol.
- The Mobile Storage Solution devices are available with the following hardware configuration:
  - Synology DiskStation DS3617XS
  - 12x10TB respective 12x12TB hard disks in a Raid6 (double parity) array
  - 4x1Gb RJ45 network connection & 2\*10Gb SFP+ connection
  - The device can be encrypted with a customer key based on share level
  - Data can be copied with SMB towards the NAS filer at customer location
  - Data can be copied using the Synology cloudsync app to synchronize the data from Synology DiskStation towards OTC OBS environment
- Restrictions by the Synology device:
  - nfs protocol is not available for encrypted shares
  - The name of a file or folder within an encrypted shared folder cannot exceed 143 English characters or 47 Asian characters3
- Prerequisites for Mobile Storage Solutions
  - o Elastic Cloud Server (ECS) in Open Telekom Cloud for accessing Synology GUI
  - DHCP services in customer network environment that provide an IP address to NAS device or, if preferred, customer can provide an IP address that will be set by T-Systems before NAS device will be shipped to the customer
  - At least 1\* 10Gb SFP+ connector for network connections
  - Device that is capable of copying data from customer storage environment to NAS device where a 10Gb network should be available for larger amounts of data

# Recommendation #1: It is strongly recommended that the original should not be deleted until the data on the NAS device has been copied to the OTC and verified there for consistency.

Recommendation #2: Since OTC operations team has administrative rights on the NAS device, in theory an access to the data can be gained. Therefore it is recommended that customer encrypts the data by himself.

### 1.3.1 Synology DiskStation DS3617xs at a Glance

Weight: 9.80kg Height: 7U Size (Height x Width x Depth) (mm) 270 x 300 x 340 Power Supply Unit / Adapter: 500W / AC Input Power Voltage: 100V to 240V Operating Temperature: 5°C to 40°C (40°F to 104°F) Relative Humidity: 5% to 95% RH



Figure 1: Hardware overview

No.	Article Name	Location	Description
1	Status Indicator		Displays the status of the system. For more information, see "Appendix B: LED Indicator Table".
2	Alert Indicator		Displays warnings regarding fan or temperature. For more information, see "Appendix B: LED Indicator Table".
3	Power Button		<ol> <li>Press to power on the DiskStation.</li> <li>To power off the DiskStation, press and hold until you hear a beep sound and the Power LED starts blinking.</li> </ol>
4	LAN Indicator	Front Panel	Displays the status of the network connection. For more information, see "Appendix B: LED Indicator Table".
5	Drive Status Indicator		Displays the status of the installed drive. For more information, see "Appendix B: LED Indicator Table".
6	Drive Tray		Install drives (hard disk drives or solid state drives) here.
7	Drive Tray Lock		Lock or unlock drive trays.
8	Power Port	-	Connect the AC power cord here.
9	Fan		Disposes of excess heat and cools the system. If the fan malfunctions, the DiskStation will emit a beeping sound.
10	PCI Express Expansion Slot		Supports a PCIe x8 network interface card.
11	USB 3.0 Port		Connect external drives or other USB devices to the DiskStation here.
12	Expansion Port	Back Panel	Connect Synology Expansion Unit <sup>1</sup> to the DiskStation here.
13	Console Port		This port is used for manufacturing use only.
14	RESET Button		<ol> <li>Press and hold until you hear a beep sound to restore the default IP address, DNS server, and password for the admin account.</li> <li>Press and hold until you hear a beep sound, then press and hold again until you hear three beep sounds to return the DiskStation to "Not installed" status so that DiskStation Manager (DSM) can be reinstalled.</li> </ol>
15	LAN Port		Connect network cables here.

Figure 2: LED indicators

### 1.3.2 Safety Instructions

	Keep away from direct sunlight and away from chemicals. Make sure the environment does not experience abrupt changes in temperature or humidity.
	Place the product right side up at all times.
	Do not place near any liquids.
	Before cleaning, unplug the power cord. Wipe with damp paper towels. Do not use chemical or aerosol cleaners.
	To prevent the unit from falling over, do not place on carts or any unstable surfaces.
	The power cord must plug in to the correct supply voltage. Make sure that the supplied AC voltage is correct and stable.
	To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.
<b>*</b>	Risk of explosion if battery is replaced with an incorrect type. Dispose of used batteries appropriately.
10	

Figure 3: Safety instructions

### 1.3.3 In case of emergency

In case of emergency, please contact OTC personnel at <a href="mailto:sdm@open-telekom-cloud.com">sdm@open-telekom-cloud.com</a>

# 2 PROCESS DESCRIPTION

The following figure gives an overview of the Mobile Storage Solution process which is described in detail in the following chapters:



Figure 4: Process overview

# 3 MOBILE STORAGE PREPARATION

After providing the MSS request sheet to <u>service@open-telekom-cloud.com</u>, the coordinator will prepare the NAS device for sending it to our customers.

The following steps will be initiated:

- 1. Request whitelisting of customers ECS server so that access to DSM operating systems is possible after the NAS device is connected to the LAN environment in DC Biere
- 2. Request a password for the user MSSUser with that the customer can connect to the share "MSS" on the NAS device
- 3. Request the change of the encryption key for the share "MSS" with that an encryption of the share can be established

The password will be provided by the Service Delivery Manager either via phone or SMS. Customers preference can be set in the MSS request sheet.

# 4 TRANSPORTATION OF NAS TO CUSTOMER

The NAS device will be transported to customer by General Overnight. Contact for this process is also the coordinator. The flight case will be sent to the person stated in the MSS request sheet.

# 5 CONNECTING THE NAS DEVICE

#### 5.1 Connect and start up the Diskstation

Step 1: Plug 2 fiber LAN Cables (LC Multimode) with 10Gbit to connect Disk Station to your Switch or Router.



Figure 5: LAN connection

Step 2: The NAS is configured using 2x10Gbit network adapters as bond, Full duplex with MTU 1500. Link aggregation is established using LACP. IP address configuration is done by DHCP services in customer network environment that provide an IP address to NAS device or, if preferred, customer can provide an IP address that will be set by T-Systems before NAS device will be shipped to the customer (set in customer request sheet).

Bond 1 Connected	
Network Interface	Network Status
LAN 5	10000 Mbps, Full duplex, MTU 1500
LAN 6	10000 Mbps, Full duplex, MTU 1500
Use DHCP	Yes
IP address	1,000,16.3
Subnet mask	255.255.255.0
IPv6 address	fe80::ee0d:9aff:fe0b:e560/64
Network Status	20000 Mbps, Full duplex, MTU 1500

Figure 6: Network configuration

Step 3: Connect one end of the AC power cord to the power port of the DiskStation, and the other to the power outlet.



Figure 7: Power cord connection

#### Step 4: Press the power button:



Figure 8: Power button for starting up the NAS device

The system will start up and the status indicator light should be static green.

### 5.2 Copy data to NAS device using SMB protocol

The data can be copied to the NAS device using the SMB protocol. Synology does not support the usage of nfs protocol for encrypted folders.

Step 1: Access shared folder through Windows Explorer

Open a Windows Explorer and enter <u>\\Synology.IP.Address\MSS</u> where "Synology.IP.Address" is the IP address that was assigned to the NAS by DHCP resp. customer IP request.



Figure 9: Connecting to NAS device

Step 2: Enter your username and password – (Username is MSSUser and the password should have been provided by the coordinator via phone / SMS).

🖷 l 💟 🗊 = l		This PC	_ 🗆 X
File Computer	View		~ <b>(</b> )
💿 🕘 = 🕇 💻 V	\otcbier01f14u20\testfolder	✓ → Search This PC	Q
쓝 Favorites	▲ Folders (6)	Windows Security	
Desktop Desktop Downloads	Desktop	Enter network credentials Enter your credentials to connect to: otcbier01f14u20	
I퇲 This PC 핵 Network	Download	MSSUser	
	<ul> <li>Devices and dri</li> <li>Local Disk</li> </ul>	Domain: OTCBIER01F14U43	
	478 GB fre	Connect a smart card	
		OK Cancel	

Figure 10: Entering credentials for MSSUser

Step 3: Copy the data from the source to the MSS share.

### 5.3 Shutdown NAS device

The NAS Device can be shut down by pressing the power button on the front of the device for approx. 7 seconds until you can hear a beep from the DiskStation.



Figure 11: Power button for shutting down the NAS device

# 6 TRANSPORTATION TO DATACENTER BIERE

### 6.1 Preparing NAS device for transportation

Place the NAS device including the accessories into the flight case and contact your coordinator who will then order the transport of the flight case to DC Biere.

Checklist:

- NAS device
- 2x Power cord



Figure 12: Picture of flight case

# 7 COPY DATA TO OTC

#### 7.1 Prerequisites

Prerequisite for copying data is the existence of a bucket in the OTC OBS environment. The following chapter shows hot to create a bucket. If a bucket already exists and an AK/SK was also created, please skip these action points and create a sync process within the Cloud Sync app.

For a detailed documentation of OTC object storage please check <u>https://docs.otc.t-</u> systems.com/storage.html

### 7.1.1 Creation of an OBS bucket

A bucket is a container used to store objects on OBS, you can create one or multi buckets before copy data from NAS to OBS bucket.

#### Procedure

Step 1 Log in to OBS Console.

Step 2 Click Create Bucket in the upper left corner.

Step 3 Select value for Storage Class, and enter a value for Bucket Name.

	×
eu-de	
• Standard O Warm O Cold For frequently-accessed (multiple times per month) hotspot or small files requiring quick response	
mytestbucket I	
	eu-de Standard O Warm O Cold For frequently-accessed (multiple times per month) hotspot or small files requiring quick response mytestbucket I

Figure 13: Creating OBS buckets

#### Notes:

- 1) Once you create a bucket, you cannot change the name of it. Make sure the bucket name you set is appropriate.
- 2) You can create a maximum of 100 buckets on OBS.
- 3) Please select Standard or Warm storage class for data copy

Step 4 Click OK.

### 7.1.2 Creating an AK/SK key

OBS uses AKs and SKs for signature verification to ensure that only authorized accounts can access specific OBS resources.

#### Procedure

Step 1 Log in to OBS Console.

Step 2 In the upper right corner of the page, click the username and choose My Credential.

Step 3 On the My Credential page, click Add Access Key below the Access Keys area. A user can create a maximum of two valid access keys.

Step 4 Enter the related information as prompted and save the newly created access key.

#### Notes:

To ensure access code security, store the access key safely. If you click Cancel in the Confirm dialog box, the access key will not be downloaded and cannot be downloaded later. If an access key will be no longer used, click Delete in the access key list to delete the access key

### 7.2 Creating a sync process

To sync files between NAS and OBS, you need to create connections on Cloud Sync to link to the OBS by using OBS AK/SK.

#### Procedure

Step 1 On the Cloud Sync user interface, click on the Create icon at the bottom-left corner to start the wizard.

	Clo	ud Sync	7 - 0 X
1 6	Overview Task list	Schedule Settings History	
	- U		
		() in the second s	
	Connection Information	1	
	Connection Information		
	Connection Information Cloud Type: Username:	) 	
	Connection Information Cloud Type: Username: Storage Usage:		
	Connection Information Cloud Type: Username: Storage Usage:		
	Connection Information Cloud Type: Username: Storage Usage:	-	

Figure 14: Starting up the Cloud Sync app

Step 2 OBS is s3-compatible storage services, please choose "S3 storage" as the Cloud Provider and click Next.

1		Cloud Sync	× 7	
	Cloud Providers Choose a public cloud to sync.			
		Y Search		
	🍐 Google Drive	icloud S3	^	
	HiDrive	h hubiC		
	IBM Softlayer	🚷 MegaDisk		
	ConeDrive	0penStack Swift		
	🕼 Rackspace	S3 storage		
	SFR NAS Backup	S Tencent Cloud COS		
	WebDAV	🥭 Yandex Disk	~	
+		Next	Cancel	

Figure 15: Choosing S3 storage

Step 3 Select "Custom Server URL" in S3 Server.

		Cloud Sync	×	
Acc Enter	ount setting the following information	n		
S3 Se	rver:	Amazon S3	• 0	
Acces	s key:	Amazon S3		
Secre	t key:	Amazon S3 China		
Bucke	t name:	Custom Server URL		

Figure 16: Choosing customer server URL

#### Step 4 Input Server Address and OBS AK/SK

Account setting Enter the following information		
S3 Server:	Custom Server URL	0
Server address:	obs.eu-de.otc.t-systems.com	
Access key:	G3YD2VPEQVGRFRSZ7GRE	
Secret key:		1
Bucket name:	-	

Figure 17: Entering AK/SK

Input OBS Region URL "obs.eu-de.otc.t-systems.com" as the OBS server address

Step 5 Select a bucket as the cloud sync target bucket.

1	Account setting	mytestbucket m obssunway-0706-videos obs-1ba1 obs-5757		×		
	Enter the following information	obs-908c-test obs-9bd4	l			
	S3 Server: Server address: Access key: Secret key:	obs-9e0a obs-ayhan obs-azjb obs-b28c-jason-test obs-b316		0		
	Bucket name:	mytestbucket	*			
+	Back	Next	Cancel			

Figure 18: Select OTC OBS bucket

#### Step 6 Task setting

Task setting Name your sync task an	d choose a folder to sync		B
Connection name:	task		]
Local path:	/testfolder		
Remote path:	Root folder		0
Sync direction:	Upload local changes only	h. 🔻	
Part size (MB):	64 MB	Ū.	]
Enable advanced consis	tency check (more resources required)		
Data encryption 🕧			
Don't remove files in th	e destination folder when they are remov	ved in the source fol	der.
Schedule settings			

Figure 19: Defining Cloud Sync task settings

Task name: This name will show on the connection list.

Local path: Select a local folder. All directories and files within this folder will be synced to /from the remote path.

Remote path: Select a remote folder. All directories and files within this folder will be synced to/from the local folder.

Sync direction: Select whether you want the sync to be Bidirectional, Download remote changes only, or Upload local changes only. Here we will select "Upload local changes only" to sync data from NAS to OBS.

Don't enable data encryption to do client-side data encryption.

Don't remove files in the destination folder when they are removed in the source folder.

Schedule settings: Go to this section to enable your schedule for file syncing.

#### Step 7 Optimizing Concurrent Uploads

Administrator Controls			
Administrator controls			
Database Location Settings:	Volume 1 (Available: 💌		
Concurrent uploads/downloads:	20 💌		
Maximum records:	100000	0	
Administrator mode:	Enabled -	0	
General Choose a default action when re-link	ing occurs:		
Locally deleted files will be re-fe	tched from your public cloud		
Locally deleted files will be remo	oved from your public cloud		

Figure 20: Optimzing concurrent uploads

For an optimal utilization of the network bandwidth, please set the concurrent uploads to a value of 20.

Step 8 Cloud Sync finished.

<u>_</u>		Clou	d Sync	P	-	×
1		Overview Task list	Schedule Settings History			
∧ admin						
🥡 task	0		Up to date			
R			Your DiskStation is now up-to-date.			
		Connection Information	S3 storage			
		Bucket name:	mytestbucket01			
		Server address:	obs.eu-de.otc.t-systems.com			
1	0					

Figure 21: Confirmation for successful sync process

#### Step9 Unlink Cloudsync task

When the task status is in up-to-data, it means that all the data in the local was synced to OBS. then you can unlink the task by pressing "Manage / Unlink".

			Cloud Sync		7 - 8	×
1		Overview Task lis	t Schedule Sett	tings History		
∧ admin		Create Edit O	pen Delete			
🚺 task	0	Local path	Remote pa	ith	Status	1
		/testfolder	Root folder	r.	Up to date	
1	0					
7	Q.					

Figure 22: Deleting Cloud Sync task

# 8 SECURITY

### 8.1 Data security of NAS device

Data encryption has become an essential strategy for data security over the network. Encryption prevents sensitive data from getting hacked and misused by hackers for illegitimate purposes, and it also helps protect your computer from viruses and accompanying system vulnerabilities.

To keep your personal data secure and away from potential malicious users, DiskStation Manager (DSM) adopts an encryption technology called Advanced Encryption Standard (AES), by storing your data in an encrypted format with a set of encryption keys. In addition, DSM provides share-level AES 256-bit encryption to block unauthorized access attempts.

Recommendation #2: Since OTC operations team has administrative rights on the NAS device, in theory an access to the data can be gained. Therefore it is recommended that customer encrypts the data.

#### 8.2 Secure erase of NAS device

After the copy process, the data on the NAS device will be securely erased using the dd command. Example for HDD1 is "dd if=/dev/zero of=/dev/sda bs=1M count=1"

# 9 MSS REQUEST FORM

Торіс	Value	Comment
Customer Name		
Customer address		
Customer contact	Name:	
	Phone:	
	Email:	
TSI Coordinator	Name:	
	Phone:	
	Email:	
Request date		
Request period		
Network Information NAS device	DHCP Address	Set your preference: Should DHCP be used or do you prefer a manual IP assignment by T-Systems
	IP Address:	
	Subnet Mask:	
	Gateway:	
	DNS Server:	
	Link Aggregation via LACP	
Tenant ID		Needed for invoicing
EIP of Admin ECS		Public IP Address of NAS Access Server (needed for Whitelisting)
MSSUser Password should be provided via	Phone: SMS:	Please set your preference

Figure 23: MSS Request Form

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