



Tiger STORE

Tiger Store 2.8 Administration Guide

January 11, 2018

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Introducing Tiger Store

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Introducing Tiger Store

Congratulations on your purchase of Tiger Store, Tiger Technology's metadata controller for scale-out NAS and SAN platforms.

This manual will guide you in the process of setting up your Tiger Store metadata controller, administering the access to it and the volumes it manages. This guide is intended for administrators of Tiger Store.

You can find the most up-to-date version of this manual at the following address:

<https://www.tiger-technology.com/software/tiger-store/docs>

The Tiger Store Workflow

With the help of Tiger Store you can achieve a true SAN workflow, providing multiple Windows, Apple Mac and Linux computers with concurrent access to NTFS shared volumes. For the purpose, the computer running Tiger Store must be connected directly or through a switch to the shared storage through 8/16G FC (for FC storage), 1/10GbE (for iSCSI storage) or using SAS connection.

Regardless of their connection Tiger Clients gain block-level access to each shared volumes. Tiger Clients can mount the shared volumes as:

- SAN clients - using FC or GbE connection to the storage.
- LAN clients - using GbE connection to the storage server.

To prevent data corruption when multiple computers access the same file system, Tiger Store acts as a metadata controller that processes requests, coming from Tiger Clients through the LAN connection. Computers that don't have the Tiger Client driver cannot mount volumes managed by Tiger Store, although they might be connected to them. These computers can only mount the volumes that Tiger Store has specified that it doesn't manage and protect.

If you Tiger Store is part of an Active Directory domain, requests for access to the shared volumes are authenticated against the domain controller. If Tiger Store is deployed in workgroup environment every user has full access to all data on the shared volumes.

Besides acting as a metadata controller on your SAN, Tiger Store also provides you with automatic defragmentation of the shared storage volumes, storage usage and connectivity monitoring tools, etc. You can also greatly optimize your shared storage workflow using the following add-ons:

- pooling of shared volumes and presenting them as one virtual file system.
- automatic data replication and space reclaiming services provided by Tiger Bridge.
- failover between Tiger Store server nodes for high availability.

Using the web interface you can also reformat existing volumes, create new volumes and check and repair the file system of volumes.

Concepts Used Throughout the Guide

Storage Server — the computer running Tiger Store software, which acts as a SAN manager and controls access to the volumes it sees and can manage. When the high-availability add-on is activated, the storage server is comprised of two server nodes.

Primary node — when the high availability add-on is activated, this is the server node that is currently processing requests from Tiger Clients and is managing the volumes. The primary/secondary node division is only nominal and depends solely on which server node takes over the leading role first.

Secondary node — when the high availability add-on is enabled, this the server node that is currently in standby mode. In case the primary node fails or is shut down for maintenance, the secondary node takes over its role and starts processing requests for access to the shared volumes i.e. becomes primary node. The primary/secondary division node is only nominal and depends solely on which server node takes over the leading role first.

Failover — the process of transferring the metadata controller role from one server node to the other. As long as the high availability add-on is activated and set up, the failover between server nodes is automatic and ensures constant access to the shared volumes. In most cases the failover is transparent - the second server node takes over the metadata controller role absolutely transparently to all running applications and they can continue working with any open files after the failover takes place. During the failover process requests for access to the shared volume(s) coming from Tiger Clients are not rejected but just delayed till the other server node takes over the metadata controller role.

Tiger Client — each computer running the Tiger Client software, which can mount the shared volume(s). You can install the Tiger Client software on as many computers as you like. Each Tiger Client computer can share the volumes it has mounted or folders on them to LAN clients on the network as SMB/CIFS shares.

SAN Client — a Tiger Client computer that is connected to the shared storage directly or through a switch using FC, network connection (for iSCSI storage) or using a SAS connection.

LAN client — a Tiger Client computer that mounts the shared volumes using GbE connection to the storage server. In contrast to computers on the LAN that don't have the Tiger Client software installed and access only LAN shares of the shared storage, LAN clients mount the volumes and gain block-level access to them.

Shared volume — a volume managed by Tiger Store, which all connected Tiger Clients can mount and work with, in contrast to computers that have access to the volume but don't have the Tiger Client software installed.

Private volume — a volume managed by Tiger Store, which is accessible only to the storage server, usually for performing maintenance operations. Tiger Clients and computers without the Tiger Client software installed cannot mount and work with private volumes.

Offline volume — a volume that is not managed and protected by Tiger Store and that can be mounted by any computer that has access to it. Tiger Store cannot prevent data corruption on offline volumes, when more than one computer accesses them.

SAN to LAN failover — In case there is a failure of the FC HBA or FC cable (or a network port or cable for iSCSI SAN) on a Tiger Client, the SAN to LAN failover mechanism lets this computer reconnect to the shared volumes over the Ethernet and thus it can continue working with the volumes although with decreased performance. For the purpose the Tiger Client computer should disconnect from the storage server and then reconnect again. Once the problem is fixed, the Tiger Client should again disconnect and reconnect to the Tiger Store in order to mount the volume(s) over the SAN connection.

Cluster view — when the high availability add-on is activated, this is the web interface through which your Tiger Store network is administered. It represents the settings valid for the high availability cluster, regardless of the server node currently playing the role of metadata controller. As long as both server nodes are available, changes introduced in cluster view are synchronized automatically among them.

Node view — when the high availability add-on is activated, this is the web interface, showing the settings valid just for a selected server node. The purpose of the node view is to allow you to resolve conflicting settings of server nodes that cannot be automatically synchronized in cluster view. You can also use it to view and control node specific settings (like Tiger Store activation, firmware version if Tiger Store runs on an appliance, etc.). Changing settings in node view must be done with caution in order not to create conflicts between the settings of both node.

Tiger Store Administrator — the user account with which any user can log on to Tiger Store's web interface and administer the Tiger Store network. The web interface of Tiger Store is accessible to any device with a web browser that is on the same network as the storage server.

Data on the Shared Volumes

By default, data on the shared storage is accessible to anyone seeing the shared volumes. By adding Tiger Store in an Active Directory domain, you can utilize access permissions for data on the shared volumes. When Tiger Store is set up to operate in domain environment, the permissions that are already set on the file system are respected. You can manage the permissions from any Windows Tiger Client computer, which can mount the shared volume(s). For more details, refer to the documentation of the Windows Domain Server that controls permissions on your network.

Important: *Whether or not the volumes are accessed in domain environment, the SYSTEM account must always have full control.*

Tiger Store doesn't support Windows Recycle Bin on its volumes and any soft-deleted file is permanently deleted. Mac OS X Trash is supported on the shared volumes, allowing Mac OS X clients to soft-delete files and later restore them or permanently delete them by emptying the Trash. When Tiger Store operates in Active Directory domain environment, each domain user moves their soft-deleted files to their own Trash folder. In workgroup environment, as the Trash folder is created per user ID and two or more different users on different Mac OS X clients may move their soft-deleted files to the same Trash folder and respectively - empty the Trash containing the files of other users with the same ID.

Storage Server System Requirements

Note: *Tiger Store appliances come with Tiger Store software pre-installed.*

To be able to play the role of a metadata controller, the computer on which you install the Tiger Store software must meet the following minimum system requirements:

- PC with 1.8-GHz 64-bit (x64) processor.
- 64-bit Microsoft Windows® 7/Server 2008 R2, Windows® 8/Server 2012/Server 2012 R2, Windows® 10/Server 2016.

Important: *Microsoft Windows® 7/Server 2008 R2 computers must run at least Service Pack 1 and have the KB3033929 security update installed.*

- 4 GB of physical RAM at least.
- 200 MB of available hard-disk space for installation.
- Network LAN connection (1 Gb at least).
- 4Gb/8Gb/16Gb FC, 1GbE/ 10GbE or SAS adapter for connection to the storage.
- Network LAN connection (1Gb at least) for public communication.
- The following TCP ports - 80, 3000, 3001, 8555, 9120, 9121, 9122, 9123, 9124, 9125, 9126, 9127 - must not be blocked by a firewall, if any, and must not in use by any other service or application.

iSCSI Requirements

Although Tiger Store is designed to work with any iSCSI initiator, it is currently certified to work with:

- Microsoft iSCSI Software Initiator
- UNH iSCSI Initiator
- Studio Network Solutions' globalSAN iSCSI initiator for OS X
- ATTO Xtend SAN iSCSI initiator

Note: *If you use an iSCSI initiator not listed above, you can contact Tiger Technology support team with inquiry about possible support.*

High Availability Add-on Requirements

Unless you use a Tiger Store appliance with two server nodes, to deploy Tiger Store with high-availability you must install Tiger Store on two computers, which aside from meeting the above mentioned system requirements, must also be set up in the following way:

- The network LAN connection (1 Gb at least) used for public communication must be named “Public” on both nodes.
- The two nodes must be interconnected through an additional direct network connection (1 Gb at least), named “Admin” on both nodes.
- Both server nodes must have an exact IP address for the “Admin” network connection:
 - Node A - IP address: 1.2.3.4 with subnet mask 255.255.255.0
 - Node B - IP address: 1.2.3.5 with subnet mask 255.255.255.0

Storage Requirements

Tiger Store supports any simple or striped NTFS-formatted volume to which the storage server has Read & Write access. You can connect the computer/appliance to the shared storage via Fibre Channel (directly or using a FC switch), using SAS connection or using network connection to iSCSI storage. The storage server can also share its own internal disks, letting any computer on the same LAN gain block-level access to them.

Important: *If you want to use a Tiger Store appliance with iSCSI storage, you should contact the Tiger Technology support team for assistance on setting up the iSCSI initiator on the appliance for work with the storage.*



Getting Started with Tiger Store

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Install Tiger Store

Note: *Tiger Store comes pre-installed on all Tiger Store appliances. For steps about performing a firmware update of the appliance, refer to "Firmware Update of the Appliance" on page 96.*

You should install the Tiger Store software on the computer that will play the role of metadata controller on your Tiger Store network. Once you install the software and activate Tiger Store on the computer, all supported storage devices that the computer sees and that meet the storage requirements can be shared to Tiger Clients, preventing computers that don't run the Tiger Client software from mounting them.

Additionally, to allow client computers to download the Tiger Client software from the home page of Tiger Store's web UI, you should also install the client bundle, containing the Tiger Client installation for all supported platforms.

Note: *The Tiger Store installation creates the `tbox_db` user account to run maintenance tasks scheduled for it in the Tasks Scheduler of the metadata controller computer. It is important not to delete or disable neither the user account nor the tasks set to it.*

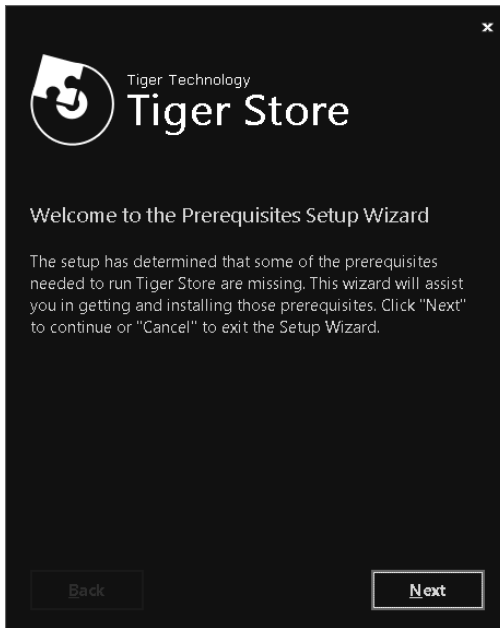
Should you decide to change the metadata controller on your Tiger Store network, you should uninstall and deactivate the Tiger Store software from the current storage server and install and activate it on the new computer that will play the role of metadata controller. For steps about uninstalling and deactivating Tiger Store, refer to "Tiger Store Activation" on page 19.

To install Tiger Store and the client bundle on the storage server:

Important: *Before you install Tiger Store on the storage server, make sure that any other SAN management software is uninstalled from the system.*

1. On the selected computer, log on using an account with administrative privileges.
2. Browse for and double-click the Tiger Store installation file.

The installation begins.



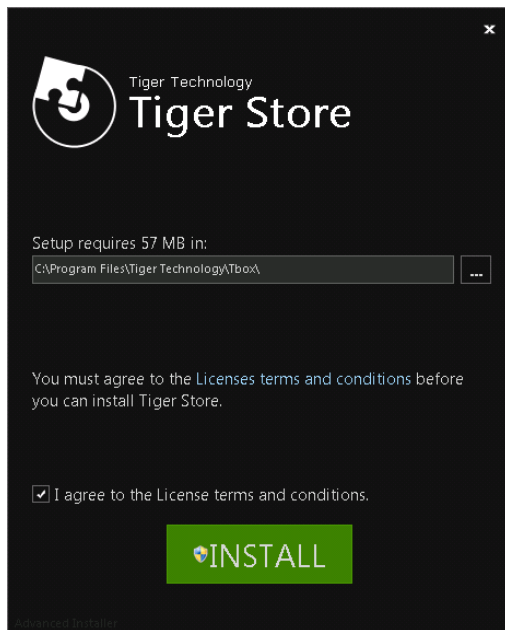
3. Click Next.

Getting Started with Tiger Store

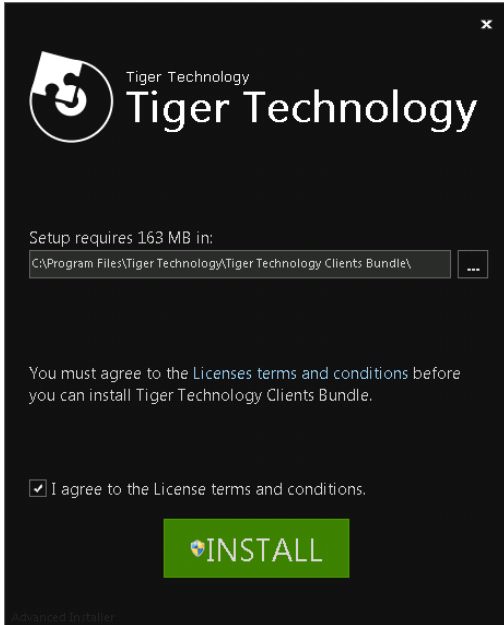
4. If the wizard suggests the installation of additional prerequisites, accept and click Next.



5. Select where to install the product, accept the terms of the software license agreement and click Install.



6. When the installation finishes, click Finish and select not to restart the computer, when prompted.
7. Browse for and double-click the Tiger Store clients bundle installation file.
8. When the installation starts, click Next.
9. Select where to install the clients bundle, accept the terms of the software license agreement and click Install.



10. When the installation finishes, restart the computer.

Access the Web Interface of Tiger Store

Tiger Store can be administered through its web interface, which is accessible to every device with a web browser that is on the same network as the storage server. To access it, in a web browser enter the IP address of the storage server's network port, to which your computer is connected.

By default, the web interface uses a pre-set password:

admin

It is advisable to set new password for the web interface in order to prevent unauthorized access to the Tiger Store network administration. See "Change the Password for the Web Interface" on page 18.

Getting Started with Tiger Store

Note: *Tiger Store’s web interface is accessible with most web browsers as long as JavaScript is enabled. If you experience any problems with Tiger Store’s web interface, please, contact Tiger Technology support.*

To access the web interface from a network computer:

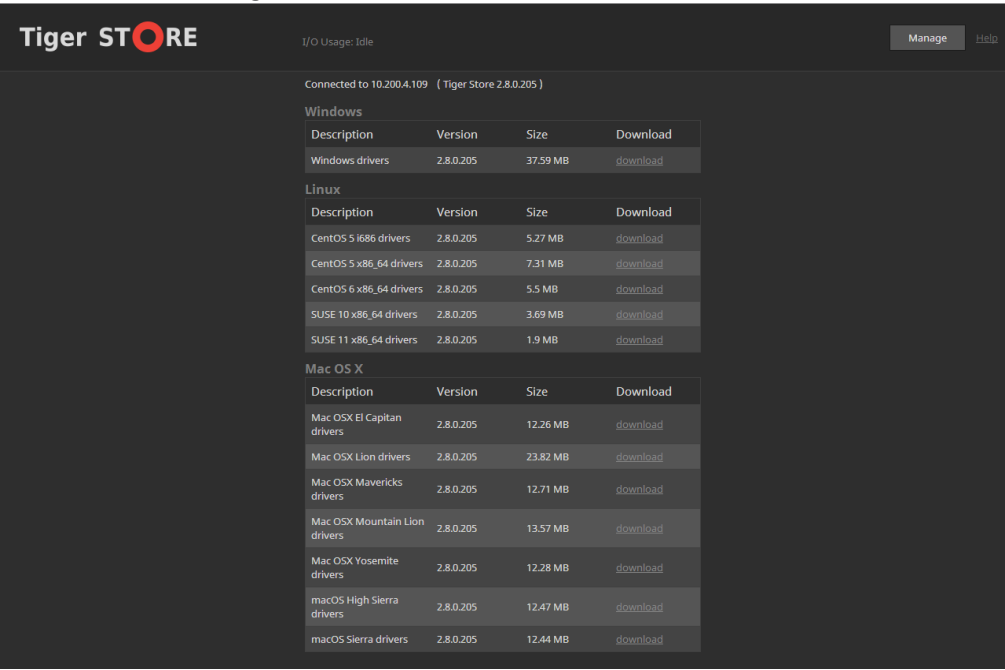
1. In a web browser, do one of the following:

- type the IP address of the storage server;
- type the domain name of the storage server;

Important: *A DNS server on the network must resolve the IP address of the storage server to its domain name.*

2. Press Enter.

The web interface of Tiger Store loads.



3. Click Manage and type the password for the web interface.

Change the Password for the Web Interface

Tiger Store’s web interface is accessible after supplying a password. By default, the web interface of Tiger Store uses a predefined password:

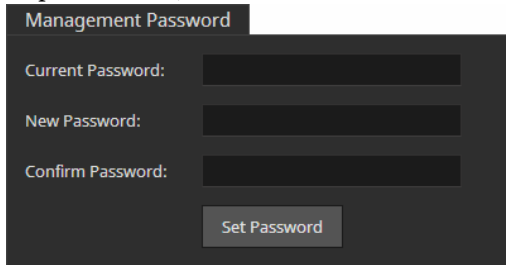
admin

It is advisable to change the predefined password as the web interface is accessible to every computer on the same network. You can change the password for the web interface at any time.

Note: *On Tiger Store appliances with two server nodes, to set identical password on both nodes, either change the password when both nodes are online, or assign the same password to an offline node once you turn it on, following the same steps, but in the node view of this server node.*

To change the web interface password:

1. In the left pane of the web interface, click System and then Settings.
2. In the Management Password field, enter the current password and the new password in the respective fields, and then click Set Password.



The screenshot shows a dark-themed web interface for changing the management password. At the top, there is a header 'Management Password'. Below it, there are three input fields: 'Current Password:', 'New Password:', and 'Confirm Password:'. Each field has a corresponding dark input box. At the bottom of the form, there is a button labeled 'Set Password'.

Tiger Store Activation

Activate Tiger Store

Note: *Tiger Store appliances are shipped with pre-activated licenses. To view the activation status of your Tiger Store appliance, refer to the steps below.*

To benefit from Tiger Store you have to activate the product and any add-on licenses in the web interface.

Important: *Until you activate Tiger Store on the metadata controller, the volumes it is connected to are not protected from data corruption and cannot be shared to Tiger Clients.*

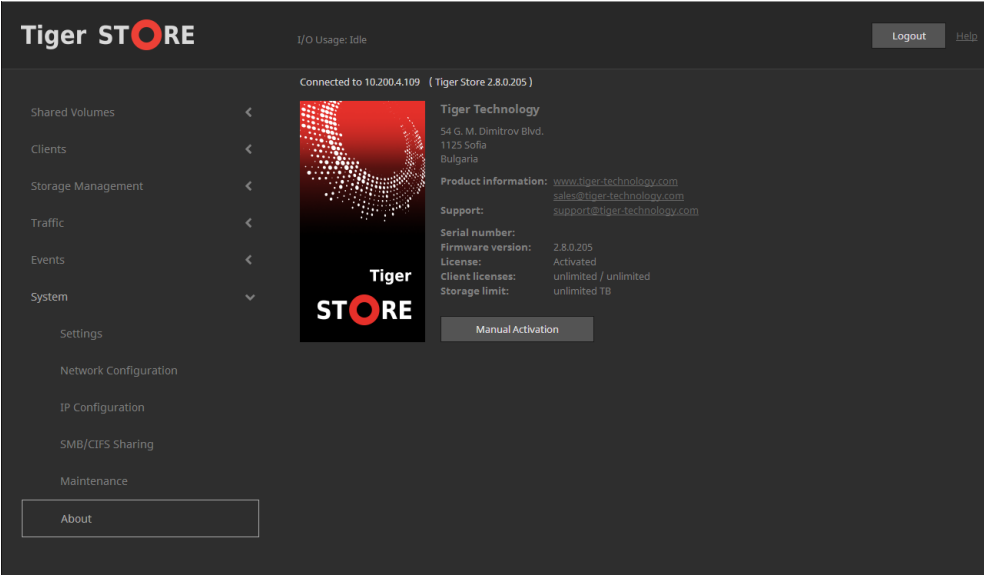
The activation procedure consists of two parts - obtaining an activation key on the licensing server and activating the licenses in the web interface of Tiger Store.

Getting Started with Tiger Store

To view the activation status of a Tiger Store appliance:

In the left menu, click System and then About.

The About page loads. It displays license information about the appliance.



Not present — no license file is found.

Valid till... — displays the date until which the license is valid.

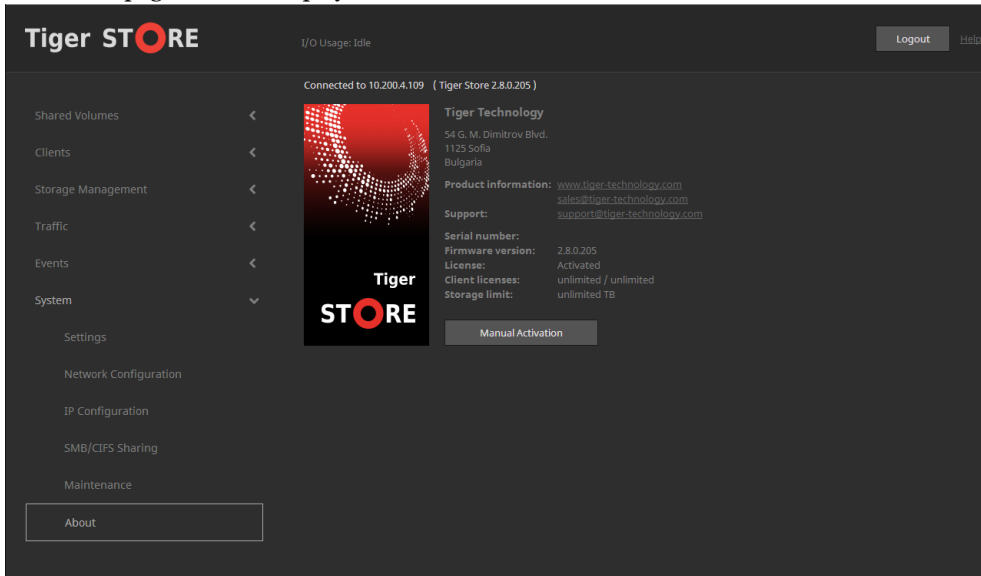
Expired — the license has expired.

Activated — a valid permanent license file is installed.

To activate Tiger Store:

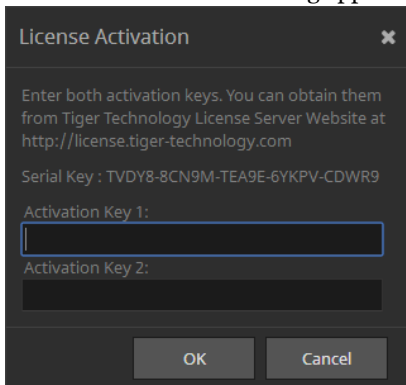
1. In the left menu of Tiger Store's web interface, click System and then About.

The About page loads. It displays license information about the metadata controller.



2. Click Manual Activation.

The License Activation dialog appears.



3. Copy the serial number and in a web browser go to:
<http://license.tiger-technology.com>
4. In the home page of the licensing server, enter your order name and password in the corresponding fields, and click Log in.

Getting Started with Tiger Store

Note: *If you enter the Tiger Technology licensing site for the first time, you should fill the registration form to continue.*

Important: *The order name and the password are case sensitive.*

The server displays information about your account.

5. In the Licensing Server menu, click Activate License.
6. In Activate License, paste the serial number for your copy of Tiger Store and click Generate Activation Key.

The licensing server generates two activation keys.
7. In the License Activation dialog in the Tiger Store web interface, paste the keys generated for your copy of Tiger Store, and click OK.

The About page displays the activation status of the metadata controller and the type of license used.

Uninstall Tiger Store

Note: *You cannot uninstall the product from a Tiger Store appliance.*

You can uninstall the software-only version of the product from the storage server at any time, keeping in mind that when you install it again on the same computer, you will have to activate it anew.

When you need to assign another computer as a metadata controller, you need to uninstall and deactivate Tiger Store from the current storage server in order to use it on another computer. For steps, refer to “Deactivate Tiger Store” on page 22.

To uninstall Tiger Store:

1. Display the Control Panel.
2. Double-click Programs and Features.
3. Right-click Tiger Store and select Uninstall.
4. Confirm that you want to uninstall Tiger Store.
5. When prompted, restart the computer.

Deactivate Tiger Store

Note: *You cannot deactivate the product from a Tiger Store appliance.*

When you want to transfer your licenses to another machine, you have to obtain new activation key (as the activation key is granted per machine) and return the old one by deactivating your licenses

for this computer. After deactivating Tiger Store on the current storage server, you will not be able to activate it again with the same key even if you reinstall Tiger Store.

Currently, Tiger Store doesn't provide interface for deactivating the product. For the purpose, you need to contact Tiger Technology support for assistance on transferring your license to another computer.

Enable File Security in the Tiger Store Network

Note: *There's no need to enable file security on a Tiger Store appliance, if you have specified the deployment environment of the appliance during the initial setup.*

By default, data on the shared storage is accessible to anyone seeing the shared volumes. If your Tiger Store storage server is in an Active Directory domain, you can utilize access permissions for data on the shared volumes. To enable support for file security on the shared volumes, you should create a new string value in the Tiger Store registry on the metadata controller.

Important: *Note that when the metadata controller is no longer part of an Active Directory domain, you must disable the support for file security on the volumes it shares to Tiger Clients.*

To enable/disable support for file security on the shared volumes:

1. On the Tiger Store computer, start the Registry Editor.

Tip: *To start Registry Editor, on the Start menu click Run and in the dialog type regedit.*

2. Navigate to:

HKEY_LOCAL_MACHINE\SOFTWARE\Tiger Technology\tbox\tboxmaster\settings\driver

3. Right-click in the right pane and select New | String Value.

4. Rename the new REG_SZ value to:

enable_file_security

5. Right-click **enable_file_security** value and select Modify.

6. Do one of the following:

- To enable support for file security on the shared volumes, in Value Data enter **1** and click OK.
- To disable support for file security on the shared volumes, in Value Data enter **0** and click OK.

7. Restart the Tiger Store computer.

3

Smart Storage Pooling

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Smart Storage Pooling

Note: *Smart storage pooling is not supported on Linux Tiger Clients and they always mount the individual volumes only.*

The smart storage pooling add-on allows you to unite the volumes shared by the storage server into a single virtual volume - the storage pool - that Windows and Apple Mac Tiger Clients can access through a universal mount point. The pool size equals the sizes of all volumes that comprise it and presents their existing folder structures as one merged folder structure. Volumes can contain data prior to uniting them in a storage pool and it will remain visible in the pool. Similarly, when the pool is disbanded (by disabling smart storage pooling), all data remain on the respective Tiger Store volume and is accessible through the volume itself.

When enabling smart storage pooling on volumes that already contain data, it is possible ambiguity of file objects to occur i.e. files/folders with one and the same name to exist in exactly the same location on two or more volumes in the pool. For more details, refer to “Files and Folders Ambiguity” on page 29.

By default, when writing new data on the pool, Tiger Store tries to store it on the same file system on which the containing folder is stored. In case you write new data on the root of the storage pool, Tiger Store creates it in the root of the shared volume that has more free space. You can change this default behaviour, by applying a data distribution policy. For more details, see “Data Distribution within the Storage Pool” on page 27.

To enable smart storage pooling, there must be at least two shared volumes available. While smart storage pooling is enabled, you can set any volume in the pool to Private or Offline and clients will continue to mount the pool as long as at least one of the volumes in it is shared, but cannot access data stored on volumes that are not shared.

You can enable and disable smart storage pooling at any time as long as Tiger Bridge’s replication is not currently enabled. You cannot enable smart storage pooling if workspace quotas are enabled in Tiger Spaces. Mac OS X and Windows Tiger Clients will detect that they should mount either the individual volumes or the pool, only on the next attempt to mount the Tiger Store storage.

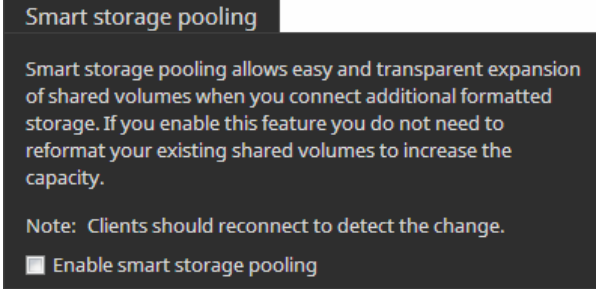
Options you might want to configure after enabling/disabling smart storage pooling include volume mount location for the pool, Tiger Bridge data replication and space reclaiming.

Enable/Disable Smart Storage Pooling

To enable/disable smart storage pooling:

Note: *You cannot change smart storage pooling settings, while Tiger Bridge data replication is enabled.*

1. In the left pane of the web interface, click Shared Volumes.
2. In Smart Storage Pooling, do one of the following:



- Select the “Enable smart storage pooling” check box, to unite all shared volumes in a pool.

Note: *You cannot enable smart storage pooling if quotas are enabled in Tiger Spaces.*

- Clear the “Enable smart storage pooling” check box, to disband the volume pool and let Tiger Clients access the individual volumes instead.

Data Distribution within the Storage Pool

By default, when writing new data on the pool, Tiger Store tries to store it on the same file system on which the containing folder is stored. In case you write new data in the root of the storage pool, Tiger Store creates it in the root of the volume that has more free space.

You can change this default behaviour for newly created folders, by applying a data distribution policy to a folder (the root of the volume pool or any folder in the pool):

Balance by size — creates the folder on the volume in the storage pool, which has more free space.

Balance by count — creates the folder on the volume in the storage pool, which has the minimal number of folder entries.

Note: *Files are always stored on the volume of their parent folder regardless of the policy you apply.*

To apply one or the other of the above policies, you should create a file with the name of the policy in the root of the storage pool or in any of its subfolders, thus instructing Tiger Store to calculate either the free space or the number of folders on each volume in the pool and only after that to create the new folder on the volume that matches the policy. Should the policy instruct Tiger Store to create the new folder not on the volume containing the parent folder, but on another volume, Tiger Store replicates the entire folder structure from the root of the volume pool to the newly created folder so that the path used to access it would be the same as if accessing it from the parent

Smart Storage Pooling

folder. For example, if on one shared volume you have a folder “Projects” that contains three subfolders - “May”, “June” and “July”, and you set the creation behaviour of folder “June” to use the Balance by count policy, when you create a new folder “Drafts” in the “June” folder, and it needs to be stored on another volume, because there are less file objects on it, Tiger Store will create in the root of the other volume, a folder “Projects” containing just the folder “June” with a subfolder “Drafts”. The policy is valid just for the folder containing the respective policy file and is not applied recursively to its sub-folders i.e. if you create new folders in the folder “Drafts”, which doesn’t contain a policy file, the new folders will be stored on the second volume.

If the policy file is missing or both files are stored in the root of the volume pool, Tiger Store assumes that the default behaviour should be used i.e. the folder should be created on the same file system on which the containing folder is stored or, in case this is the root of the volume pool - on the volume that has more free space.

Note: *You can create the policy file from any connected Tiger Client that can mount the pool or the volumes in it.*

To set policy for newly created folders from Windows:

1. In command prompt, navigate to the folder where you want to create the policy file (the root of the volume pool or a subfolder in the pool).
2. Do one of the following:
 - To set balance by size policy, execute the following command:
type NUL > .pool_balance_size
 - To set balance by count policy, execute the following command:
type NUL > .pool_balance_count

The file is created in the specified location and Tiger Store is instructed to create new folders in this location based on the rules of the selected policy.

To set policy for newly created folders from Mac OS X and Linux:

1. In Terminal/command-line, navigate to the folder where you want to create the policy file (the root of the volume pool or a subfolder in the pool).

Note: *As smart storage pooling is not supported on Linux, to create the policy file in the root of the volume pool, simply create it in the root of one of the volumes in it, making sure that another policy file doesn’t exist in the root of the other volumes in the pool.*

2. Do one of the following:
 - To set balance by size policy, execute the following command:
touch .pool_balance_size

- To set balance by count policy, execute the following command:

```
touch .pool_balance_count
```

The file is created in the specified location and Tiger Store is instructed to create new folders in this location based on the rules of the selected policy.

Files and Folders Ambiguity

As Tiger Store lets you unite in a virtual volume pool volumes that already contain data, it is possible ambiguity of file objects to occur i.e. files/folders with one and the same name to exist in exactly the same location on two or more member volumes. Additionally, Linux Tiger Clients can also contribute to file/folder ambiguity as they always mount the individual volumes and there's no way to prevent them from creating a folder/file with one and the same name in exactly location on more than one of the volumes.

Tiger Store discerns three types of ambiguity:

folder ambiguity — folders with one and the same name existing in exactly the same location on two or more volumes in the pool - for example, a folder “Work” in the root of two shared volumes.

file ambiguity — files with one and the same name existing in exactly the same location on two or more volumes in the pool - for example, a file “Work” in the root of two shared volumes in the pool.

combined ambiguity — a file and a folder with identical names existing in exactly the same location on two or more member volumes in the pool - for example, a folder “Work” and a file “Work” in the root of two volumes in the pool.

Although no data is lost after enabling smart storage pooling, the operating system does not allow two or more files/folders with exactly the same name to coexist in the same location.

When ambiguity occurs with folders, Tiger Store simply displays only one folder in the storage pool and it contains the merged contents of all ambiguous folders with the same name. Still, the displayed folder has the attributes of the ambiguous folder that has been most recently modified. For example, if a folder “Work” with Hidden attributes is stored in the root of volume A and has been most recently modified, and a folder “Work” with Read-only attributes is stored in the root of volume B, the folder “Work” in the root of the storage pool has Hidden attributes. Additionally, if you attempt to delete an ambiguous folder, all folders with the same name are deleted from their volumes.

When ambiguity occurs at file level, Tiger Store displays the ambiguous file with latest modification time stamp and hides the other instances. When performing a file operation on an ambiguous

Smart Storage Pooling

file in the file browser of your operating system, you can expect the following:

- deleting the ambiguous file that is shown in the storage pool deletes all other ambiguous files as well;
- renaming the ambiguous file that is shown in the pool renames all other ambiguous files as well;
- moving an ambiguous file, moves only the file displayed in the pool and deletes the other ambiguous files with the same name;

In the case of combined ambiguity, Tiger Store always displays the folder and hides the file with the same name. When performing a file operation, Tiger Store performs it only on the folder and ignores the files with the same name in the same location.

Resolve Ambiguities

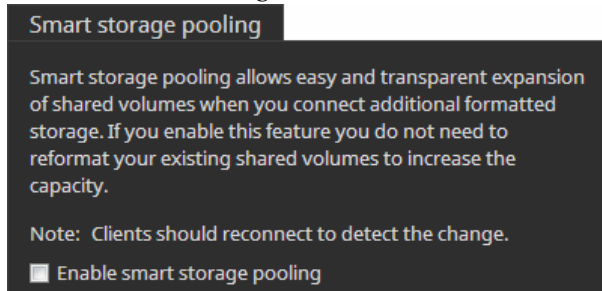
It is highly advisable to resolve all ambiguities in your pool. You can resolve ambiguities in the file browser of any Tiger Client that has mounted the pool. On Mac OS X and Windows Tiger Clients, you should first disable smart storage pooling and mount the individual volumes. To resolve ambiguities from Linux Tiger Clients, there's no need to disable smart storage pooling. You can resolve ambiguities in the following ways:

- by deleting, renaming or moving the ambiguous file/folder (file ambiguity, folder ambiguity and combined ambiguity);
- by unifying the attributes of the ambiguous folders (folder ambiguity);

Important: *When renaming or moving an ambiguous file, you should take care not to create a new ambiguity.*

To resolve ambiguity in a Tiger Client's file browser:

1. *(if you resolve ambiguities from Mac OS X or Windows)* In the Shared Volumes page, clear the "Enable smart storage pooling" check box, to disband the volume pool and let Tiger Clients access the individual Tiger Store volumes.



Note: *You cannot change smart storage pooling settings, if Tiger Bridge data replication is enabled.*

2. In the file browser of your operating system, open one of the member volumes to the ambiguous file/folder and do one of the following:
 - delete, rename or move to another location the ambiguous file/folder;
 - change the ambiguous folder's attributes to match the attributes of the other ambiguous folders with the same name;
3. Repeat the above step until all ambiguities in the pool are resolved.
4. (*optional, if you have disabled smart storage pooling*) In the Shared Volumes page, select the "Enable smart storage pooling" check box, to unite the available Tiger Store volumes in a pool.

4

Manage the Tiger Store Storage

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Manage the Tiger Store Storage

For the purposes of the Tiger Store workflow, you can manage the volumes accessible to the storage server in the following ways:

- Share/unshare a volume (see “Share or Unshare Volumes” on page 37).
- Make a volume offline (see “Make a Volume Offline” on page 38).
- Set volume mount location on Windows Tiger Clients (see “Set Volume Mount Location (Windows Only)” on page 39).

Additionally, depending on whether you use the software-only version of the product or a Tiger Store appliance, you can perform some or all of the following operations on volumes, connected to the storage server:

- Rename a volume (see “Rename a Tiger Store Volume” on page 52).
- Create a new volume or create/re-build a RAID on appliances exporting their own storage (see “Create New Volume” on page 41).
- Manage dynamic disks seen by Tiger Store appliances managing external volumes (see “Manage Dynamic Disks Connected to the Appliance” on page 51).
- Perform maintenance operations on a volume:
 - Check and repair the file system of a volume (see “Check and Repair The File System” on page 53).
 - Enable/disable auto-defragmentation of the shared volume(s) (see “Volume Defragmentation” on page 54).
 - Manually defragment a shared volume, when auto-defragmentation is disabled (see “Manually Defragment a Tiger Store Volume” on page 54).
- Export a volume or a folder on it as a SMB/CIFS share to computers that don’t have the Tiger Client software installed (see “Share a Volume as a SMB/CIFS Share” on page 55).

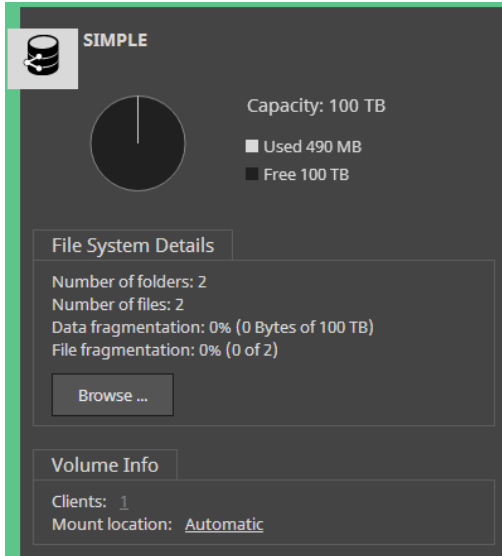
Some of the above operations on the shared storage require higher protection. That is why before you perform them, you may have to unshare the volume for Tiger Clients, enter Maintenance mode or even shut down one of the nodes of a Tiger Store storage server with two server nodes. Entering Maintenance mode automatically disconnects all client computers from the shared volumes, that is why it is advisable to make sure that no file operation is being interrupted by entering Maintenance mode. After exiting Maintenance mode client computers are not automatically reconnected to the shared volume and have to manually connect to the storage server in order to mount the volume(s).

Important: *If the storage server is rebooted while in Maintenance mode, any maintenance operation going on at the moment is canceled and clients can reconnect to Tiger Store.*

View Storage Information

View Shared Volumes Details

You can view details about volumes shared to Tiger Clients in the Shared Volumes page of the web interface. If smart storage pooling is disabled for Tiger Store, it displays all shared Tiger Store volumes as separate volume tiles. If smart storage pooling is enabled, it displays the volume tile of the virtual volume. You can view the following details:



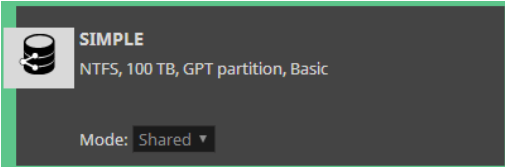
- Volume name.
- Pie chart of the volume capacity with free and used space statistics.
- File system details - number of files and folders on the volume, and fragmentation statistics.
- Number of connected clients.
- Default mount location of the volume on all Windows Tiger Clients.

View All Volumes Details

In the Volumes page (Storage Management | Volumes) each volume seen by Tiger Store is presented with a separate tile, even if smart storage pooling is enabled on Tiger Store. The volume

Manage the Tiger Store Storage

tile in the Volumes page gives you information about the file system, size, partition and disk type, and the mode of the volume for Tiger Clients (shared, offline or private).

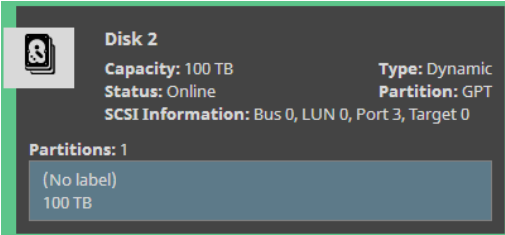


Viewing Disks Details

Note: This view is available only on Tiger Store appliances, which manage external storage.

You can view details about the disks accessible to Tiger Store in the Disks page (Storage Management | Disks).

In the Disks page each accessible disk is represented with a separate tile, that gives you information about the disk capacity, status, type and partition(s).



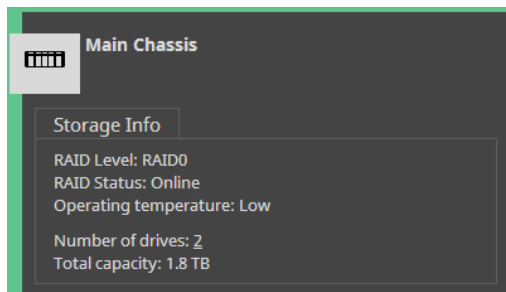
Note: To view disk details on a storage server with two server nodes, when both of them are turned on, you should view the Disks page in node view of the respective node (HA Nodes | Manage Node).

View Storage Chassis Details

Note: This view is available only on Tiger Store appliances, which manage internal storage only.

In the Chassis page (Storage management | Chassis) each available chassis is represented with a separate tile, that gives you information about the RAID level and status, the number of drives

comprising the RAID, the total capacity of the RAID and the temperature reported by the RAID controller:



Note: If the RAID initialization has been halted or interrupted for some reason, a button *Resume* appears in the chassis' tile, allowing you to resume the RAID initialization process.

Share or Unshare Volumes

Volumes in the Tiger Store network can have one of the following states:

Shared — the volume can be mounted only on Tiger Clients;

Note: If smart storage pooling is enabled (see "Smart Storage Pooling" on page 25), the pool mounts on Tiger Clients only if at least one of its volumes is shared.

Private — the volume is accessible only to the storage server and neither Tiger Clients, nor computers without the Tiger Client software can mount it and work with it;

Offline — the volume is not managed by Tiger Store and can be mounted by any computer that sees it;

Note: This option is not available on Tiger Store appliances exporting their own disk array to Tiger Clients.

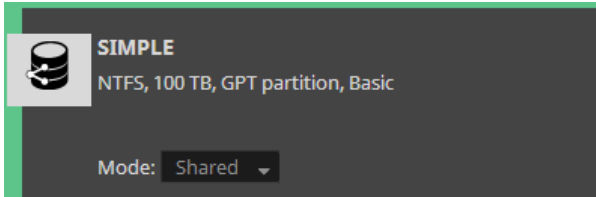
You can choose which of the volumes managed by the storage server to share to Tiger Clients (by making them shared) and which ones to computers without the Tiger Client software installed (by making them offline). You cannot share a Private volume that is currently used as a replication target by Tiger Bridge. To share such a volume, first disable Tiger Bridge replication on it.

Whenever you perform a maintenance operation like checking and repairing the file system of a volume, instead of disconnecting Tiger Clients from all shared volumes by entering Maintenance mode, you can unshare the volume on which you will perform the respective maintenance operation and after that share it again. You can also set a volume to Private, in order to use it as a replication target for Tiger Bridge. In this case, you cannot share the volume to Tiger Clients until you disable Tiger Bridge replication on it.

To share a volume to Tiger Clients:

Important: *If you share an Offline volume, all non-Tiger Client computers that access it will dismount it and will lose any unsaved data on that volume.*

1. In the left pane of Tiger Store's web interface, click Storage Management and then Volumes.
2. In the Volumes page, find the tile of the private/offline volume, which you want to share and in the drop-down box select Shared.



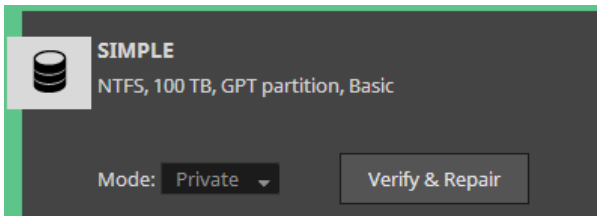
Note: *You cannot share a volume if the product is not activated.*

3. Confirm that you want to share the volume to Tiger Clients.
The volume is shared to all Tiger Clients that have access to it.

To make a volume Private for the storage server:

Important: *If you make Private an Offline volume, all non-Tiger Client computers that access it will dismount it and will lose any unsaved data on that volume.*

1. In the left pane of Tiger Store's web interface, click Storage Management and then Volumes.
2. In the Volumes page, find the tile of the volume, which you want to unshare and in the drop-down box select Private.



3. Confirm that you want to make the volume Private for the storage server.
The volume is made Private for the storage server and all computers that had access to it (Tiger Clients or non-Tiger Clients) can no longer mount it.

Make a Volume Offline

Note: *This option is not available on Tiger Store appliances exporting their own disk array to Tiger Clients.*

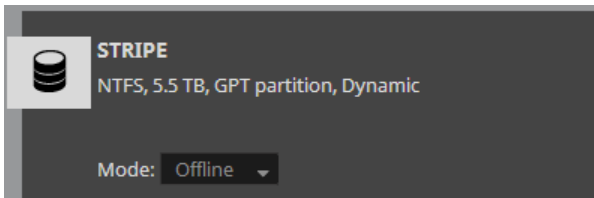
By default, Tiger Store manages all volumes that the storage server is connected to. Whether or not the storage server shares them to Tiger Clients, these volumes are protected and cannot be mounted by computers that don't run the Tiger Client software, even though they may have access to these volumes. To let non-Tiger Client computers work and mount volumes that Tiger Store sees, you should remove Tiger Store's protection over them. You can do this by making them Offline. An Offline volume is accessible to any computer that sees that volume.

Important: *As offline volumes are not protected by Tiger Store, you should take care not to let more than one computer to mount them at a time in order to prevent data corruption on them.*

To make a volume offline (remove Tiger Store protection):

Important: *If you make a shared volume Offline, all Tiger Clients that access it will dismount it and will lose any unsaved data on that volume.*

1. In the left pane of Tiger Store's web interface, click Storage Management and then Volumes.
2. In the Volumes page, find the tile of the volume, which you want to make offline and in the drop-down box select Offline.



Note: *You cannot set to Offline a volume that is currently used as a replication target by Tiger Bridge. To make the volume Offline for the appliance, you must first disable Tiger Bridge replication on it.*

3. Confirm that you want to make the volume Offline.

The volume is made Offline and all non-Tiger Client computers that see it can mount it.

Set Volume Mount Location (Windows Only)

By default, each Tiger Store volume uses Automatic mount location on all client computers:

- Windows - the first available drive letter.
- Mac OS X - **/Volumes**.
- Linux - **/mnt** directory with an automatically created symbolic link **/Volumes**, which points to the **/mnt** directory.

In the web interface of Tiger Store, you can specify a preferred drive letter as mount location of a Tiger Store volume on all Windows machines. This way, you can make a volume to be mounted in one and the same location on all Windows machines that see it.

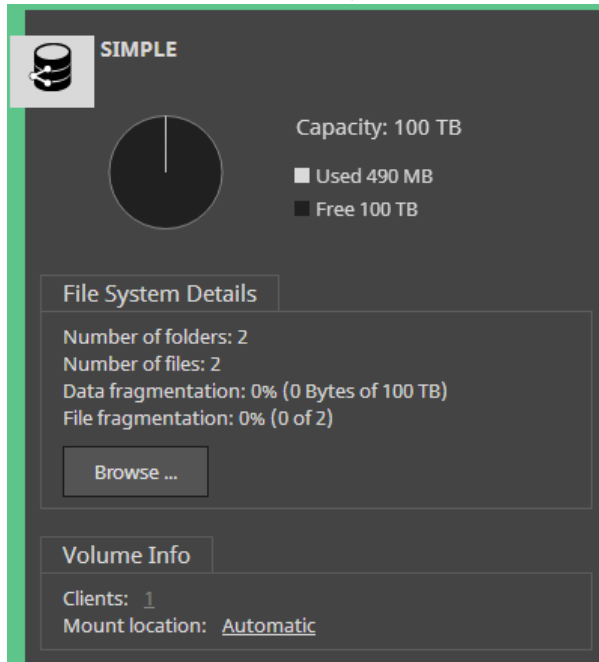
Manage the Tiger Store Storage

Note: If you specify a drive letter as default mount location, but this drive letter is already in use on a Windows Tiger Client computer, it uses Automatic as mount location setting.

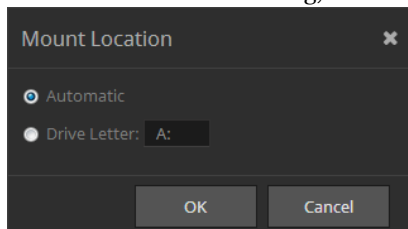
You can also overwrite this setting for a particular Windows Tiger Client, by specifying different drive letter as default mount point on this computer. For more information, refer to the “Tiger Client User’s Guide”.

To set default mount location on Windows Tiger Clients:

1. In the left pane of Tiger Store’s web interface, click Shared Volumes.
2. In the tile of the selected volume, click the link next to Mount Location.



3. In the Mount Location dialog, do one of the following:



- Select Automatic to let the volume mount on Tiger Clients using the first available drive letter.
- Select Drive Letter and in the drop-down box select a drive letter.

4. Click OK.

The volume is mounted in the new mount location on Tiger Clients only after they remount it.

Create New Volume

The steps for creating a new volume differ depending on whether your storage server runs a software-only version of Tiger Store or you use a Tiger Store appliance.

On Tiger Store appliances exporting their own disk array to Tiger Clients, you can only create a new RAID on the chassis of the appliance or re-build an existing RAID. See “Manage RAID” on page 47.

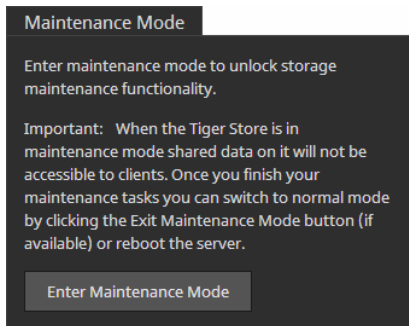
Create New Volume (Software-only version)

You can create a new volume on the computer that is storage server after you enter Maintenance Mode. Entering Maintenance mode automatically disconnects all Tiger Clients from the shared storage and stops any file operation going on at the moment.

You can also create a new volume on the disks of a volume seen by the storage server from any non-Tiger Client computer that sees these disks, as long as the volume is made Offline in the Tiger Store interface (see “Make a Volume Offline” on page 38).

To create a new volume:

1. In the left pane of the web interface, click System and then Maintenance.
2. In the Maintenance page, click Enter Maintenance Mode and then confirm that you want to enter Maintenance mode.



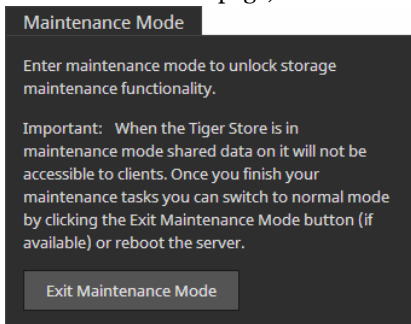
The storage server automatically disconnects all Tiger Clients currently accessing the volumes.

Important: *If you exit Maintenance mode or the storage server is rebooted while in Maintenance mode, any maintenance operation going on at the moment is canceled and clients can re-connect to Tiger Store.*

3. On the storage server, create the new volume, following the steps described in your OS documentation.

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4. In the left pane of the web interface, click System and then Maintenance.
5. In the Maintenance page, click Exit Maintenance Mode.



6. In the left pane of the web interface, click Storage Management and then Volumes.
7. Do one of the following:
 - to share the volume to Tiger Clients, in the tile of the newly created volume, click Shared.
 - to let non-Tiger Client computers access the volume, in the tile of the newly created volume, click Offline.

Create New Volume on a Tiger Store Appliance

Note: On Tiger Store appliances exporting their own disk array to Tiger Clients, you can only create a new RAID on the chassis of the appliance or re-build an existing RAID. See "Manage RAID" on page 63.

You can create a new volume in the web UI of a Tiger Store appliance managing external storage. You can create either a simple GPT volume (on a single disk) or an NTFS striped volume (on multiple disks). The new volume can be on disks that are not part of any volume or on the disks of an existing volume. When you create a new volume on the disks of an existing volume, you need to clean the disks of their storage type (basic or dynamic). For more information, refer to "Clean Disks" on page 42. When creating an NTFS striped volume, you can set the stripe chunk size of the new volume.

You can also create a new volume on the disks of a volume seen by Tiger Store from any non-Tiger Client computer that sees these disks, as long as the volume is made Offline in the Tiger Store interface (see "Make a Volume Offline" on page 38).

Clean Disks

To create a new volume on the disk(s) of an existing volume, you should first clean the disks of their storage type. By cleaning a disk from its storage type you destroy the existing volume and all data on it. When the disks, on which you want to create a new volume in Tiger Store's web UI, are not part of an existing volume, there's no need to clean them.

On appliances with two server nodes, you can clean a volume's disks or create a new volume in cluster view (the appliance's web UI), but only one of the server nodes must be online. When both server nodes of your appliance are online, before proceeding you should shut down one of the server nodes.

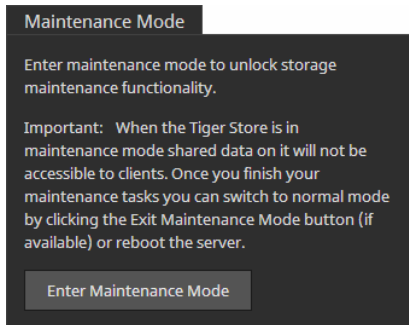
Important: *Cleaning a disk is an operation that requires entering Maintenance mode. Entering Maintenance mode automatically disconnects all client computers from the shared storage and stops any file operation going on at the moment.*

To clean a disk of its storage type:

1. In the left pane of the web interface, click System and then Maintenance.

Important: *On appliances with two server node, both of which are online, before entering Maintenance mode in cluster view, you must first shut down one or the other server node in node view of the web interface.*

2. In the Maintenance page, click Enter Maintenance mode and confirm then confirm that you want to enter Maintenance mode.



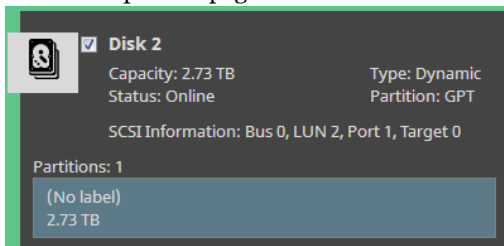
The appliance automatically disconnects all Tiger Clients currently accessing the volumes and the button changes to Exit Maintenance mode.

Note: *If you exit Maintenance mode or the appliance is rebooted while in Maintenance mode, any maintenance operation going on at the moment is canceled and clients can re-connect to Tiger Store.*

3. In the left pane of Tiger Store's web interface, click Storage Management and then Disks.

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4. In the Disks page, select the tile of the disk that you want to clean and click Clean Disk in the menu on top of the page.



Tiger Store cleans the selected disks of their storage type and when the operation finishes updates their tiles with type “Unknown”.

Tip: You can view the operation progress in the band at the top of the page.

5. Do one of the following:
 - Without exiting Maintenance Mode, proceed to create a new volume on the cleaned disk(s).
 - Exit Maintenance Mode (go to System | Maintenance, and click Exit Maintenance Mode) to let client computers connect to the shared volumes again.

Create New Basic GPT Volume

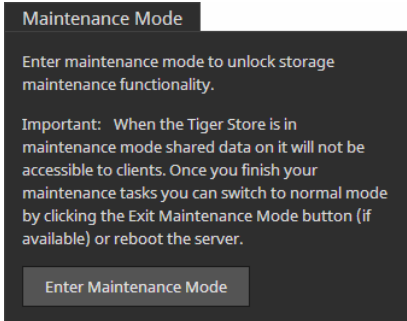
Important: Creating a new volume is an operation that requires entering Maintenance mode. Entering Maintenance mode automatically disconnects all client computers from the shared volumes and stops any file operation going on at the moment.

To create a new basic GPT volume:

1. In the left pane of the web interface, click System and then Maintenance.

Important: On appliances with two server node, both of which are online, before entering Maintenance mode in cluster view, you must first shut down one or the other server node in node view of the web interface.

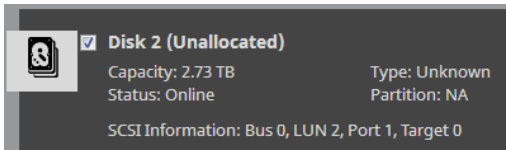
2. In the Maintenance page, click Enter Maintenance mode and confirm then confirm that you want to enter Maintenance mode.



The appliance automatically disconnects all Tiger Clients currently accessing the volumes and the button changes to Exit Maintenance mode.

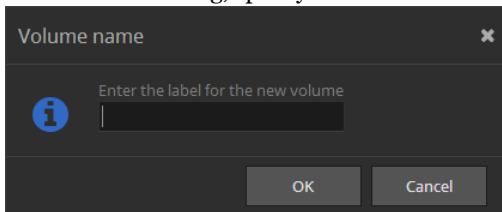
Note: *If you exit Maintenance mode or the appliance is rebooted while in Maintenance mode, any maintenance operation going on at the moment is canceled and clients can re-connect to Tiger Store.*

3. In the left pane of Tiger Store's web interface, click Storage Management and then Disks.
4. Select the tile of the disk on which you want to create the new basic GPT volume and click Create Volume.



Note: *The disk you have selected must be with "Unknown" type, designating it's cleaned of its storage type formatting.*

5. In the Volume dialog, specify the name of the new volume and click OK.



6. Exit Maintenance Mode (go to System and then Maintenance, and click Exit Maintenance Mode) to let Tiger Clients connect to the shared volumes again.
7. Do one of the following:
 - to share the volume to Tiger Clients, in the tile of the newly created volume, click Shared.

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- to let non-Tiger Client computers access the volume, in the tile of the newly created volume, click Offline.
8. On an appliance with two server node, manually turn on the other server node by clicking its power button on the front panel of the appliance.

Create New Striped GPT Volume

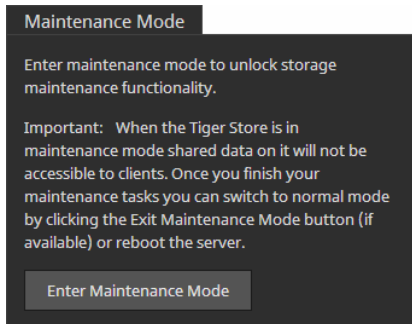
Important: *Creating a new volume is an operation that requires entering Maintenance mode. Entering Maintenance mode automatically disconnects all client computers from the shared volumes and stops any file operation going on at the moment.*

To create a new striped GPT volume:

1. In the left pane of the web interface, click System and then Maintenance.

Important: *On appliances with two server node, both of which are online, before entering Maintenance mode in cluster view, you must first shut down one or the other server node in node view of the web interface.*

2. In the Maintenance page, click Enter Maintenance mode and confirm then confirm that you want to enter Maintenance mode.

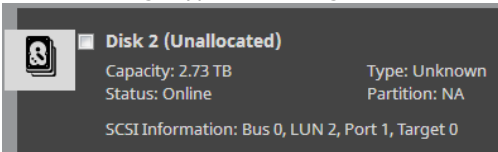


The appliance automatically disconnects all Tiger Clients currently accessing the volumes and the button changes to Exit Maintenance mode.

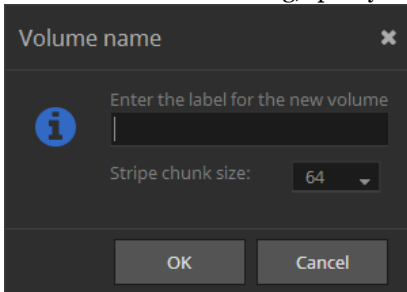
Important: *If you exit Maintenance mode or the appliance is rebooted while in Maintenance mode, any maintenance operation going on at the moment is canceled and clients can re-connect to Tiger Store.*

3. In the left pane of Tiger Store's web interface, click Storage Management and then Disks.
4. Select the tiles of the disks on which you want to create the new striped volume and click Create Stripe.

Note: The disks you have selected must be with "Unknown" type, designating they are cleaned of their storage type formatting.



5. In the Volume Name dialog, specify the name of the new volume.



6. (optional) In Stripe Chunk Size, select the desired value.

Note: If you don't make a selection, Tiger Store uses the default stripe chunk size of 64KB.

7. Click OK.

Tiger Store creates a new striped volume on the selected disks.

8. Exit Maintenance Mode (go to System and then Maintenance, and click Exit Maintenance Mode) to let Tiger Clients connect to the shared volumes again.
9. Do one of the following:
 - to share the volume to Tiger Clients, in the tile of the newly created volume, click Shared.
 - to let non-Tiger Client computers access the volume, in the tile of the newly created volume, click Offline.
10. On an appliance with two server node, manually turn on the other server node by clicking its power button on the front panel of the appliance.

Manage RAID

Note: You can create a new RAID or re-build an existing RAID through the Tiger Store web interface only on appliances exporting their own storage.

Create a New RAID

Note: This option is available only on Tiger Store appliances, exporting their own disk array.

Manage the Tiger Store Storage

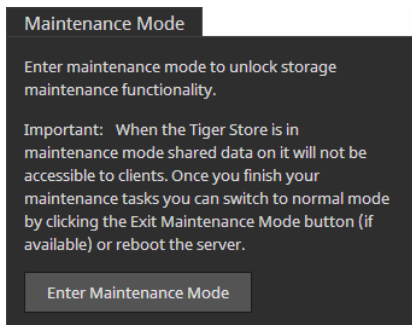
You can create a new RAID on the disks of the main chassis or the expansion chassis. For the purpose, first you have to destroy the existing RAID (if any) and then create the new RAID, choosing between the following RAID types:

- RAID 5 (default) - provides optimal performance and allows the RAID to operate with one failed drive;
- RAID 6 - provides improved fault tolerance, allows the RAID to operate with up to two failed drives;
- RAID 0 - provides maximum speed;

Important: *All data on the disks will be lost after creating a new RAID. That is why it is advisable to back it up before creating the RAID.*

To create a new RAID:

1. In the left pane of the web interface, click System and then Maintenance.
2. In the Maintenance page, click Enter Maintenance mode and confirm then confirm that you want to enter Maintenance mode.

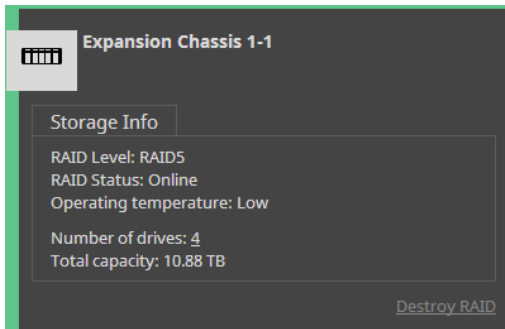


All connected Tiger Clients are automatically disconnected from the storage and any file operation going on at the moment is canceled.

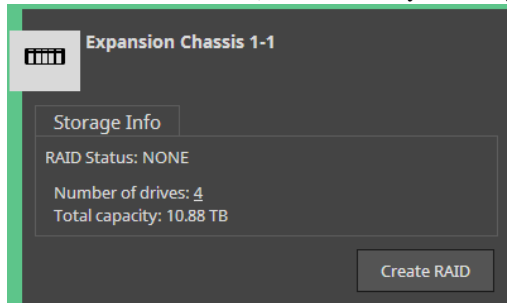
Important: *If you exit Maintenance mode or the appliance is rebooted while in Maintenance mode, any maintenance operation going on at the moment is canceled and clients can re-connect to Tiger Store.*

3. In the left pane of the web interface, click Storage Management and then Chassis.

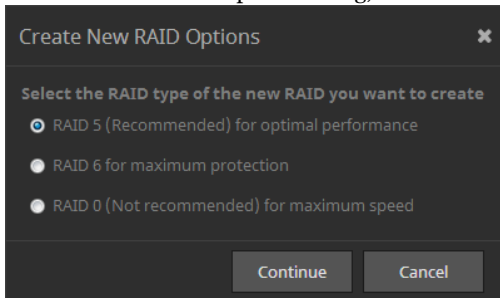
4. In the Chassis page, find the tile of the chassis whose RAID you want to destroy and click Destroy RAID.



5. Click Continue to confirm that you want to destroy the RAID.
Tiger Store destroys the RAID.
6. In the tile of the chassis, whose RAID you have just destroyed click Create RAID.



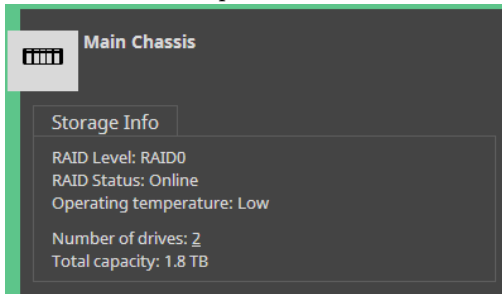
7. In Create New RAID Options dialog, select the RAID type and click Continue.



8. When the newly created RAID appears as a volume in the Volumes page, exit Maintenance mode (in System | Maintenance, click Exit Maintenance Mode) and share the new volume to Tiger Clients.

Re-build Existing RAID

The RAID controller of Tiger Store appliance exporting its own storage reports the RAID status in the Volume tile of the respective chassis:



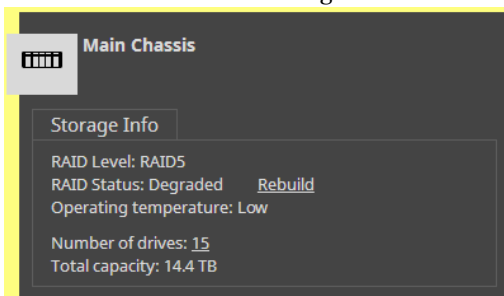
- Online
- Degraded - a drive has failed and the RAID needs to be re-built
- Rebuilding - the RAID is in the process of re-building

Note: *If the re-building of the RAID has been interrupted, the status displayed is "Degraded (Rebuild - Halted)".*

Depending on how your RAID is configured, you can replace one (RAID5) or two (RAID6) failed hard disks, while the appliance is operating and no data on the RAID will be lost (refer to the appliance Assembly Guide for information about replacing a failed RAID drive). Once you replace the failed drive(s), you must re-build the RAID, following the steps below.

To re-build the RAID:

1. In the left pane of the web interface, click Storage Management and then Chassis.
2. In the tile of a volume with degraded RAID status, click Rebuild.



While the RAID is being re-built, it is still available to Tiger Clients although with decreased performance. You can pause the RAID re-building and then resume it again.

Manage Dynamic Disks Connected to the Appliance

Note: *Tiger Store appliances exporting their own storage cannot have access to dynamic disks.*

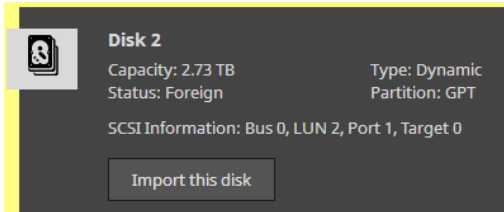
When you connect your appliance to an already formatted striped volume, it is possible that Tiger Store doesn't recognize the LDM configuration of the volume's dynamic disks and they appear as Foreign. To be able to manage the striped volume, you should import its disks.

Important: *Once you import the disks on Tiger Store, you may have to import them on each computer that has previously seen the striped volume.*

You may also have to reactivate dynamic disks that are with Offline or Missing status on the appliance, in order to manage them.

To import foreign disks:

1. In the left pane of the web interface, click Storage Management and then Disks.
2. In the tile of a Foreign disk, click "Import this disk".



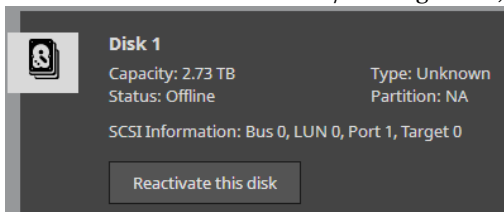
3. Confirm that you want to import the selected disk on Tiger Store.

Tiger Store imports all dynamic disks comprising the striped volume.

Note: *To let Windows SAN Tiger Clients access the striped volume, you should import its disks in Windows Disk Management on each Windows SAN Tiger Client too.*

To reactivate dynamic disks:

1. In the left pane of the web interface, click Storage Management and then Disks.
2. In the tile of a disk with Offline/Missing status, click "Reactivate this disk".



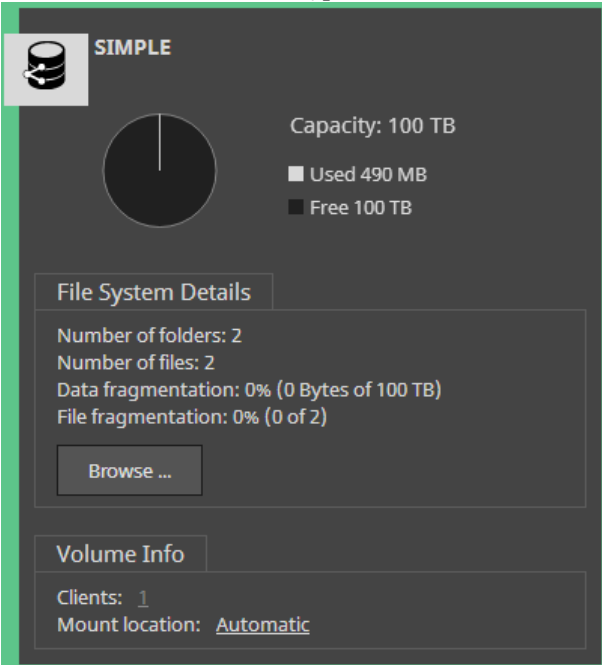
Tiger Store reactivates all disks with Offline/Missing status in the same group.

Rename a Tiger Store Volume

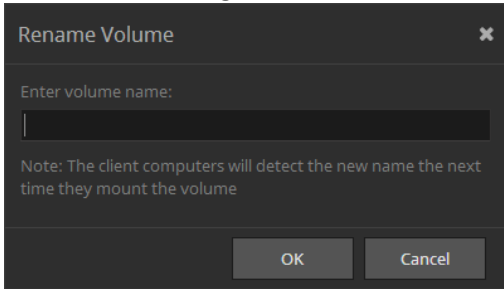
The name of each volume, managed by Tiger Store, is used as its label on client computers. When smart storage pooling is enabled on the appliance, the name of the pool is used as a label of the virtual volume (by default this is “Pool”). You can change the name of a shared volume/pool at any time. Computers that have mounted a shared volume with its old name can see it with its new name only after reconnecting to the storage server.

To rename a Tiger Store volume:

- 1. In the left pane of the web interface, click Shared Volumes.
- 2. Click the name of the volume/pool in the tile of a shared volume.



3. In the Rename dialog, enter a new name of the volume/pool and click OK.



Note: In case you need to immediately rename the volume again, wait for the web interface to refresh automatically with the latest volume name, before assigning a new one. Otherwise it is possible Tiger Store to revert to the last saved name.

The new volume name is displayed on client computers only after they remount the volume.

Storage Maintenance

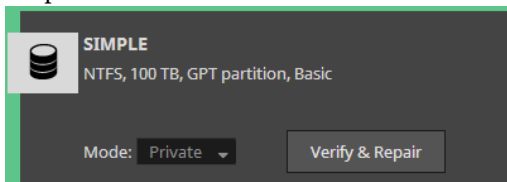
Check and Repair The File System

In the web interface of Tiger Store you can check and repair the file system of each volume. The operation goes through two stages - file system check and file system repair. While you perform the operation, Tiger Clients must not have access to the volume, that is why you should first make it private for the storage server and only after the operation finishes, share it to Tiger Clients again.

Requests for data on the volume whose file system you are checking and repairing will not be processed until the volume is again shared to Tiger Clients. Note that checking and repairing the file system of a Private volume, which is currently used as a Tiger Bridge replication target, pauses Tiger Bridge's replication & tiering until this maintenance operation finishes.

To check and repair the file system of a shared volume:

1. In the left pane of the web interface, click Storage Management and then Volumes.
2. In the tile of the volume, whose file system you want to check and repair select Private in the drop-down box.



3. Confirm that you want to make the volume Private for the storage server.

Manage the Tiger Store Storage

4. Click Verify & Repair in the volume tile.

Note: *The button is not present, if the volume is not Private for the storage server.*

5. Click Continue to confirm that you want to check and repair the file system.

When the file system check finishes, Windows Check Disk automatically attempts to repair the file system. While the operation is in progress, the volume disappears from the web UI. Once the operation finishes, the volume again appears in the web UI and you can share it to Tiger Clients (see “Share or Unshare Volumes” on page 37).

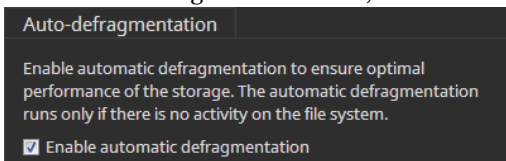
Volume Defragmentation

Tiger Store’s defragmentation engine is designed not only to reduce the fragmentation of the file system, but also to optimize the processing of file sequences on the shared volumes. By default, Tiger Store’s auto-defragmentation is enabled. It defragments data on the shared volume(s) only when the system is in idle state (overall traffic to the shared storage doesn’t exceed 10MB/s for at least 30 minutes) and automatically pauses, when traffic above this threshold is detected. You can disable auto-defragmentation and run defragmentation manually from the web interface instead.

Note: *You cannot run defragmentation (automatic or manual) on a private volume (volume that is not shared to Tiger Clients).*

To enable/disable auto-defragmentation:

1. In the left pane of the web interface, click Shared Volumes.
2. In the Auto-defragmentation field, do one of the following:



- Select the “Enable automatic defragmentation” check box, to enable auto-defragmentation of the volume.
 - Clear the “Enable automatic defragmentation” check box, to disable auto-defragmentation of the volume.
3. Click Continue to Confirm the selected option.

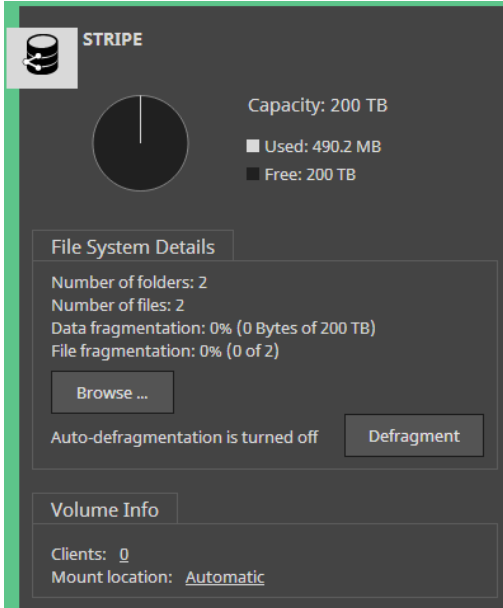
Manually Defragment a Tiger Store Volume

If you have disabled Tiger Store’s automatic defragmentation (see “Volume Defragmentation” on page 54), it is advisable that you perform manual defragmentation of the volume(s) when needed. You can keep track of the fragmentation of each Tiger Store volume in the Volume tile - it displays information about both data fragmentation and file fragmentation. Both values show the

fragmentation level of data on the disk, but using different measuring systems. Data fragmentation lists the amount of fragmented data in bytes, while file fragmentation lists the number of fragmented files. Manual defragmentation can be stopped at any time.

To manually defragment a Tiger Store volume:

1. In the left pane of the web interface, click Shared Volumes.
2. In the tile of a selected volume, click Defragment.



Important: When smart storage pooling is enabled, to manually defragment the volumes comprising the pool, you must first disable smart storage pooling (see "Enable/Disable Smart Storage Pooling" on page 26).

While the process is running, the Volume tile displays the defragmentation progress percentage and allows you to stop the defragmentation by clicking Stop Defrag.

Share a Volume as a SMB/CIFS Share

The web interface of Tiger Store on appliances allow you to export a shared volume (or a folder on it) as a SMB/CIFS share to computers on the network that don't have the Tiger Client software installed. You can export as many shares as you like or remove any one of them at any time. The exported shares are accessible to all computers on the same LAN segment, by typing the name/IP address of the appliance in the file explorer of the operating system.

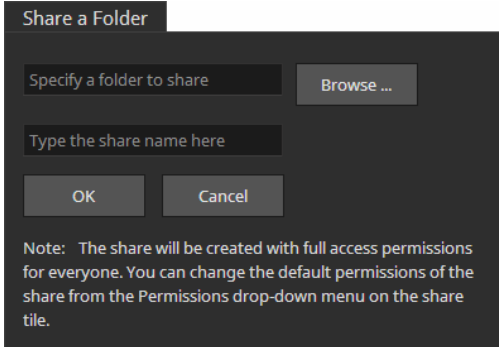
Manage the Tiger Store Storage

By default, the newly created SMB/CIFS share is accessible with “Full access” permissions to everyone. You can change the access permissions to the share for Everyone (domain or workgroup users) in the web interface of Tiger Store.

Note: To change the name of a share, you should first remove it then re-create it with its new name.

To create a SMB/CIFS share on a Tiger Store volume:

1. In the left pane of the web interface, go to System | SMB/CIFS Sharing and click Share a Folder.
2. In Share a Folder, click Browse and browse to the desired volume and select the folder on it.



Tip: To share a whole volume, select the root of the volume.

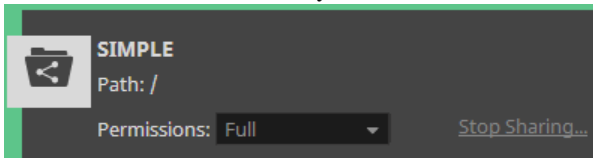
3. Enter a name of the share and click OK.

Note: If you do not specify a name of the share, it automatically takes the name of the folder.

The share appears in the list of shares. By default, it is accessible to everyone with “Full access” permissions. To change the share permissions, refer to page 57.

To remove a SMB/CIFS share of a Tiger Store volume:

1. In the left pane of Tiger Store’s web interface, click System and then SMB/CIFS Sharing.
2. Find the tile of the share that you want to remove and click Stop Sharing.

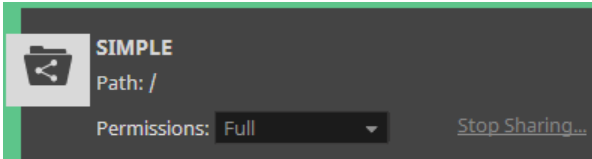


Important: All LAN clients that are currently accessing the SMB/CIFS share through Tiger Store lose connection to it and any file operation going on at the moment may fail.

3. Confirm that you want to remove the share.
The share is removed from the list of shares.

To set permissions of a SMB/CIFS share on a Tiger Store volume:

1. In the left pane of Tiger Store's web interface, click System and then SMB/CIFS Sharing.
2. Find the tile of the share whose permissions you want to set.



3. In the drop-down box, select the respective permissions for Everyone.
The permissions are applied on the next re-mount of the share on non-Tiger Client computers.



Manage Tiger Clients

<i>View Tiger Clients Information and Connection Status</i>	<i>60</i>
<i>Connect/Disconnect a Tiger Client</i>	<i>61</i>
<i>Specify the Allowed Volumes per Tiger Client</i>	<i>62</i>
<i>Restrict Tiger Clients from Manually Disconnecting</i>	<i>63</i>
<i>View Traffic Information</i>	<i>63</i>

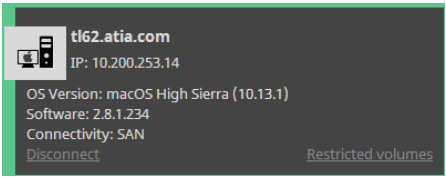
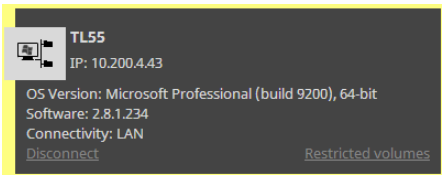
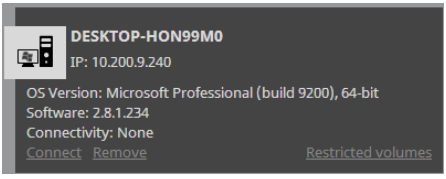
Manage Tiger Clients

As a Tiger Store administrator you can manage Tiger Client computers in the following ways:

- view connected Tiger Clients and their connection status.
- connect/disconnect a Tiger Client computer from the storage server.
- restrict Tiger Clients from disconnecting from the storage server.
- specify the volumes, which each Tiger Client can mount.
- view traffic information for Tiger Clients (see “View Traffic Information” on page 63).

View Tiger Clients Information and Connection Status

The Clients page of the web interface lists all computers on the same network, which run the Tiger Client driver and have added the Tiger Store computer/appliance to their storage servers’ list. Each Tiger Client is represented by a tile, which gives you information about the name, IP address, operating system of the computer and the version of the Tiger Client driver it is running. The tile of a Tiger Client also gives you information about the computer’s connectivity to the storage server:

 A dark grey tile with a green top border. It contains a computer icon, the name 'tl62.atia.com', IP '10.200.253.14', OS 'macOS High Sierra (10.13.1)', software '2.8.1.234', and connectivity 'SAN'. It has 'Disconnect' and 'Restricted volumes' links.	The computer is connected as a SAN client.
 A dark grey tile with a yellow top border. It contains a computer icon, the name 'TL55', IP '10.200.4.43', OS 'Microsoft Professional (build 9200), 64-bit', software '2.8.1.234', and connectivity 'LAN'. It has 'Disconnect' and 'Restricted volumes' links.	The computer is connected as a LAN client.
 A dark grey tile with a grey top border. It contains a computer icon, the name 'DESKTOP-HON99M0', IP '10.200.9.240', OS 'Microsoft Professional (build 9200), 64-bit', software '2.8.1.234', and connectivity 'None'. It has 'Connect', 'Remove', and 'Restricted volumes' links.	The computer is not connected to the storage server or is offline.

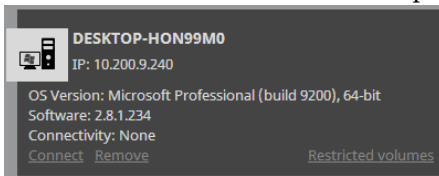
You can remove the tile of a disconnected Tiger Client computer from the list, when the computer no longer runs the Tiger Client driver, for example. If the Tiger Client computer you have removed

from the list is online, the Tiger Store computer/appliance is automatically removed from the client computer's list of storage servers.

To make a removed Tiger Client appear again on the Clients page, on the client computer you must add the storage server to the list of storage servers and manually connect to it. If the client computer is offline, when you remove it from the Clients page, to make it appear on the Clients page, once it is turned on again manually connect it to the storage server.

To remove a Tiger Client's tile from the list of client computers:

1. In the left pane of Tiger Store's web interface, click Clients.
2. In the tile of a disconnected client computer, click Remove.



The Tiger Client tile is removed from the list.

Connect/Disconnect a Tiger Client

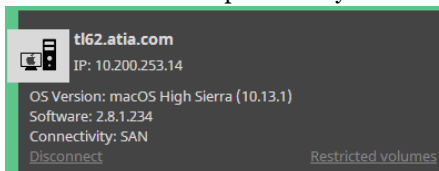
In the tile of a Tiger Client in the Clients page, you can force disconnect a selected Tiger Client from the shared volumes it sees. Vice versa, you can force connect a disconnected Tiger Client computer as long as it is currently online.

Note: *Disconnected Tiger Clients can manually connect to the appliance following the steps in the "Tiger Client User's Guide".*

To force disconnect a selected client computer:

Important: *When you disconnect a Tiger Client from a shared volume, any file operation performed from that computer on the shared volume will be canceled.*

1. In the left pane of Tiger Store's web interface, click Clients.
2. In the tile of the computer that you want to disconnect, click Disconnect.



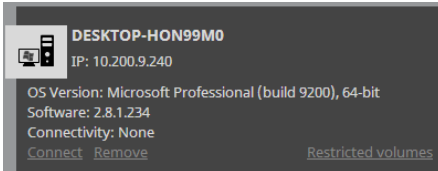
Manage Tiger Clients

Note: The Disconnect button is not present, if the Tiger Client computer has not mounted any volume.

Tiger Store disconnects the selected Tiger Client from all shared volumes it has mounted.

To force connect a selected client computer:

1. In the left pane of Tiger Store's web interface, click Clients.
2. In the tile of the computer that you want to connect, click Connect.



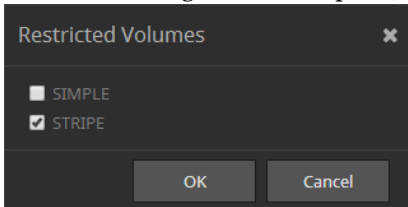
The selected Tiger Client computer mounts all volumes it is allowed to mount.

Specify the Allowed Volumes per Tiger Client

By default, each Tiger Client can mount all volumes shared by the storage server. You can restrict the mounting of certain volumes on a specific Tiger Client computer.

To restrict the mounting of a shared volume on Tiger Client computer:

1. In the left pane of Tiger Store's web interface, click Clients.
2. In the tile of a Tiger Client computer, click Restricted volumes.



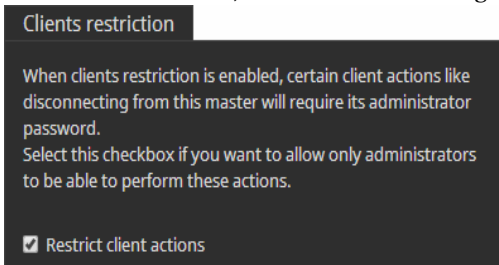
3. In the Restricted Volumes dialog, do one of the following:
 - Select the check box of a shared volume, to restrict the selected Tiger Client from mounting it.
 - Clear the check box of a shared volume, to allow the selected Tiger Client to mount it.
4. Click OK.

Restrict Tiger Clients from Manually Disconnecting

To ensure that a Tiger Client computer remains connected to the storage server no matter what user is currently logged on to it, you can set Tiger Store to require an administrators password each time a user attempts to disconnect its computer from Tiger Store. By default, this option is disabled.

To restrict Tiger Clients from manually disconnecting from the storage server:

1. In the left pane of Tiger Store's web interface, click Clients.
2. In Clients Restriction, do one of the following:



- Select the “Restrict client actions” check box, to require a Tiger Store administrator’s password when manually disconnecting from the storage server.
- Clear the “Restrict client actions” check box, to allow require a Tiger Clients to manually disconnect from the storage server.

The option you have selected is applied on each Tiger Client computer once it reconnects to the storage server.

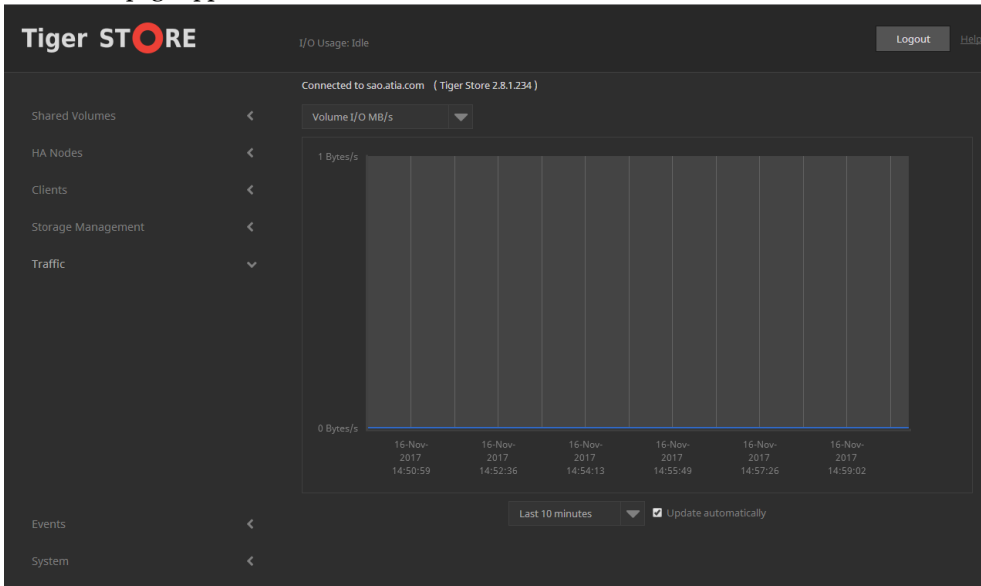
View Traffic Information

To facilitate you in monitoring the workload of the shared storage and the connectivity with currently connected Tiger Clients, Tiger Store's web interface offers you the Traffic monitoring tool. You can view data and metadata traffic statistics between the shared volumes and all currently connected computers for a selected period.

To view traffic information:

1. In the left pane of Tiger Store's web interface, click Traffic.

The Traffic page appears.



2. In the drop-down box above the graph, select the type of metric:

- Volume I/O in MB/s;
- Volume I/O in requests/s;
- Network I/O in MB/s;
- Network packets/s;
- Number of open operations;

3. In the drop-down box below the graph, select the time interval for which you want statistics.

The Traffic page displays a graph showing you the statistics for the parameters you've chosen in the respective drop-down boxes.

Tip: Instead of refreshing the web page to update the results displayed, make sure the "Update automatically" check box is selected, this way allowing the web interface to automatically update the information displayed.



Tiger Bridge Replication and Tiering

<i>Data Replication</i>	66
<i>Data Replication Policy</i>	76
<i>Manage Replicated Data</i>	80
<i>Manage Data in The Volume Browser</i>	84
<i>Re-scanning Replicated Data</i>	86

Tiger Bridge provides data replication and space reclaiming services on your shared storage. You can configure and benefit from these services only after activating Tiger Bridge on your Tiger Store storage server.

Data Replication

Data replication as implemented in Tiger Bridge is very easy to setup and perform. You should first enable data replication, by setting a replication target - where data should be copied. Then you must specify the parameters for data replication i.e. what data should be replicated. Data replication is then performed automatically in the background. In order not to obstruct file operations going on in the same time, the replication mechanism starts processing the queue with files scheduled for replication only after it detects that overall traffic to the shared storage has remained low (below 100MB/s) for at least 10 minutes. Should the traffic from client computers exceed this threshold, replication is automatically paused until traffic remains low for at least 10 minutes.

You can also manually replicate data in the Volume Browser. In contrast to automatic data replication, the manual method allows you to select any file or folder on the shared storage and copy it immediately to the replication target. For more information refer to “Manage Data in The Volume Browser” on page 84.

Enable/Disable Data Replication

By default, Tiger Bridge operates with disabled data replication. You can enable and disable data replication at any time.

To enable data replication, you should simply set a replication target, which must be accessible with Read & Write permissions from the storage server. Currently, Tiger Bridge supports the following replication targets:

- a Tiger Store volume, which is set to Private;
- a SMB/CIFS network share;
- a DDN Web Object Scaler appliance;
- LTO Tape;
- S3-compatible object storage;
- Azure Blob Storage;

Important: *You can change the replication target at any time, keeping in mind that all already replicated data will be inaccessible from the new replication target. For a workaround about migrating replicated data from one replication target to another, refer to the release notes of your version of Tiger Store.*

When you disable data replication, you lose all replication target settings and if you decide to enable it again, you will have to configure them anew. Besides, while replication is disabled, files existing solely on the replication target can no longer be recovered run-time.

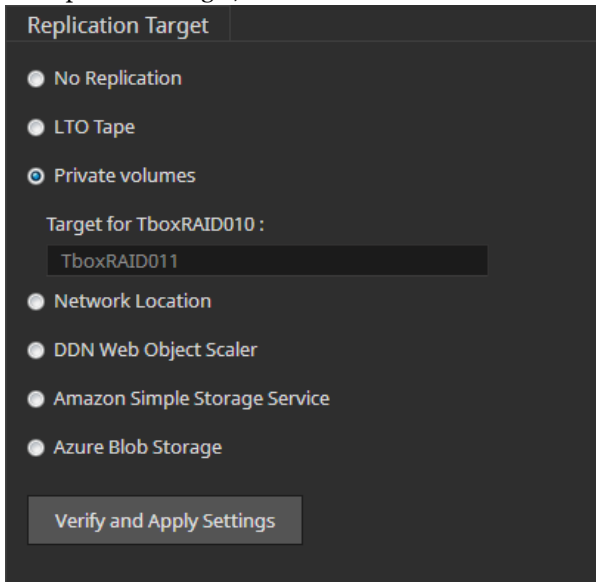
Enable Data Replication on a Private Volume

To use a Tiger Store volume as a replication target, at least one of the volumes connected to the storage server must be set to Private (see “Share or Unshare Volumes” on page 37). You can use one and the same Private volume as a replication target of all Shared volumes, or set a different Private volume for each Shared volume. In both cases, Tiger Bridge automatically creates a hidden folder `.tt_rt` in the root of the Private volume and creates a subfolder named as the GUID of each volume on which replication is enabled, in which replicated data from that volume is stored. As long as the Private volume is used as a replication target, you cannot share it to Tiger Clients until you disable Replication & Tiering or set another replication target. Once you disable replication on the Private volume, you can share it to Tiger Clients, but the `.tt_rt` folder remains hidden and to manage data in it, you should either set the file browser to display hidden files and folders, or access the folder through command-line interface.

Note: *You can disable replication of data from a selected shared volume, by configuring the data replication policy. If “Replicate everything” is selected, add the root of the volume to the exceptions list. If “Do not replicate” is selected, add the shared volumes from which you want to replicate data, to the exceptions list. For detailed steps, refer to “Data Replication Policy” on page 76.*

To enable data replication on a Private volume:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Target, select “Private volumes”.



Replication Target

☐ No Replication

☐ LTO Tape

☒ Private volumes

Target for TboxRAID010 :

TboxRAID011

☐ Network Location

☐ DDN Web Object Scaler

☐ Amazon Simple Storage Service

☐ Azure Blob Storage

Verify and Apply Settings

3. In the drop-down box next to each shared volume, select the Private volume on which to replicate data from that volume.
4. Click Verify and Apply Settings.

Important: *Until you specify criteria for the replication policy, Tiger Bridge uses the default settings - no data is replicated. For more information about specifying the replication settings, refer to "Data Replication Policy" on page 76.*

Enable Data Replication on a SMB/CIFS Network Share

To set a SMB/CIFS network share as a replication target of your shared storage, you should:

- provide the user name and password of an account that has Read & Write permissions to the network share;
- create a separate folder on the network share for each volume of your shared storage, on which replication will be enabled;

Note: *If smart storage pooling is enabled, you should create just one folder for the pool itself.*

Important: *Although you can use one and the same folder for storing replicated data from two or more shared volumes, conflicts may arise if Tiger Bridge replicates files with identical name from two or more volumes.*

Warning: *Once you create the folders, do not change their names as this may prevent Tiger Bridge replication from operating.*

To enable data replication on a network share:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Target, select “Network Location”.

Replication Target

☐ No Replication
☐ LTO Tape
☐ Private volumes
☒ Network Location

Enter the full path to the network location on which to replicate data.

eg. \\servername\sharename

Folder for volume TboxRAID010 :

Share credentials: Provide the credentials of an account that has Read & Write permissions for the network location.

User Name:

Password:

☐ DDN Web Object Scaler
☐ Amazon Simple Storage Service
☐ Azure Blob Storage

3. In the Replication Target dialog, enter the following:

- the full path to the SMB/CIFS network share.

Note: *You must enter the path to the network shares using backslashes.*

- the name of each folder on the network share to be used for each of the shared storage volumes.

Tiger Bridge Replication and Tiering

- the user name and password of a user that has Read & Write permissions on the network share.

4. Click Verify and Apply Settings.

In case Tiger Bridge cannot verify the path to the share, the credentials for access to it and the folder names, it displays an error message and prompts you to re-configure any of these settings that might not have been configured correctly.

Important: *Until you specify criteria for the replication policy, Tiger Bridge uses the default settings - no data is replicated. For more information about specifying the replication settings, refer to "Data Replication Policy" on page 76.*

Enable Data Replication on a DDN Web Object Scaler

To set a WOS appliance as a replication target of your shared storage:

- you should provide the user name and password of an account that has Read & Write permissions to the WOS appliance;
- before enabling data replication, on the WOS appliance, you should create a separate policy for each shared volume, on which replication will be enabled. Each policy should meet the following requirements:
 - the policy is not used for another volume;
 - each policy is searchable;
 - the "Search field" of each policy must contain the following values:

TT_ID

TT_PARENT_ID

Note: *If smart storage pooling is enabled, you should create just one policy for the pool itself.*

Warning: *Do not change the name of the policy on the WOS appliance as this may prevent Tiger Bridge replication from operating.*

To enable data replication on a WOS appliance:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Target, select “DDN Web Object Scaler”.

Replication Target

☐ No Replication
☐ LTO Tape
☐ Private volumes
☐ Network Location
☒ DDN Web Object Scaler

Specify the URL, policy and credentials for the Web Object Scaler:

WOS Address:

Policy for volume TboxRAID010 :

User Name:

Password:

☐ Amazon Simple Storage Service
☐ Azure Blob Storage

Verify and Apply Settings

3. In the field below, enter the following:

- address (URL) of the WOS appliance.

for example, if the WOS appliance uses 10.200.9.54 as IP address, enter the following:

http://10.200.9.54

- a name of the WOS policy to be used for each shared volume.
- the user name and password of a user that has permissions to upload/download files to the specified WOS.

4. Click Verify and Apply Settings.

In case Tiger Bridge cannot verify the URL of the WOS appliance, the credentials for access to it and that either any one of the specified policies does not exist on the WOS appliance, or it doesn't meet the criteria for replication target, it displays an error message and prompts you to re-configure any of these settings that might not have been configured correctly.

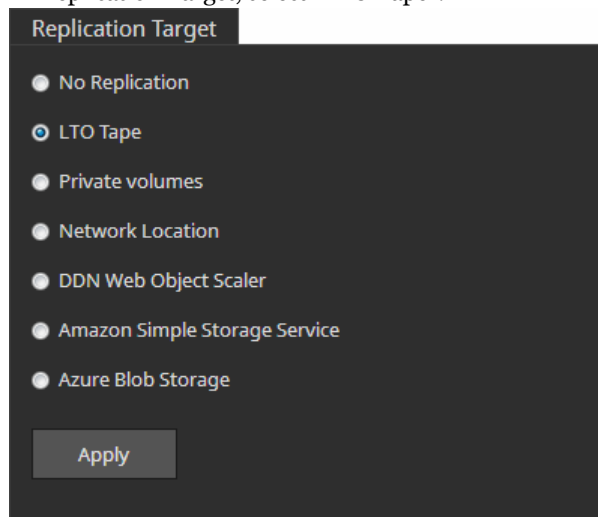
Important: *Until you specify criteria for the replication policy, Tiger Bridge uses the default settings - no data is replicated. For more information about specifying the replication settings, refer to "Data Replication Policy" on page 76.*

Enabling Data Replication on an LTO Tape Appliance

To set LTO tape as a replication target of your shared storage, as long as the storage server can access the data port of the LTO tape appliance, it will automatically connect to it once you specify LTO tape as replication target.

To enable data replication on an LTO tape appliance:

1. In the left pane of Tiger Store's web interface, click System and then Replication & Tiering.
2. In Replication Target, select "LTO Tape".



3. Click Verify and Apply Settings.

Important: *Until you specify criteria for the replication policy, Tiger Bridge uses the default settings - no data is replicated. For more information about specifying the replication settings, refer to "Data Replication Policy" on page 76.*

Enable Data Replication on S3-Compatible Object Storage

To set an S3-compatible object storage as a replication target of your shared storage, you should:

- create a separate bucket for each source volume paired with the S3-compatible object storage.
- provide access key ID and secret access key for access to all buckets designated as containers for each source volume.

Important: Do not change the name of the bucket on the S3-compatible object storage as this may prevent Tiger Bridge replication from operating.

To enable data replication on S3-compatible object storage:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Target, select “Amazon Simple Storage Service”.

Replication Target

☐ No Replication
☐ LTO Tape
☐ Private volumes
☐ Network Location
☐ DDN Web Object Scaler
☒ Amazon Simple Storage Service

Specify the server, bucket, access ID and secret access key for Amazon S3:

Server:

Access ID:

Secret Key:

Bucket for volume TboxRAID010 :

☐ Azure Blob Storage

[Verify and Apply Settings](#)

3. In the fields below, enter the following:

Tiger Bridge Replication and Tiering

- DNS name or IP address of the s3-compatible object storage server.

For example, if the s3-compatible object storage server uses 10.200.9.54 as IP address, enter the following:

http://10.200.9.54

- The Access Key ID used for access to this server.
- The Secret Access Key for access to this server;
- the name of the bucket on the S3-compatible object storage to be used for each of the shared storage volumes.

4. Click Verify and Apply Settings.

In case Tiger Bridge cannot verify the URL of the S3-compatible object storage provider, the credentials for access to it and that one of the specified buckets does not exist, it displays an error message and prompts you to re-configure any of these settings that might not have been configured correctly.

Important: *Until you specify criteria for the replication policy, Tiger Bridge uses the default settings - no data is replicated. For more information about specifying the replication settings, refer to "Data Replication Policy" on page 76.*

Enable Data Replication on Azure Blob Storage

To set Azure Blob storage as a replication target of your shared storage, you should:

- provide the account name and key for access to the Azure Blob storage;
- create a separate container for each source volume, from which you will replicate data;

Important: *Do not change the name of the container as this may prevent Tiger Bridge replication from operating.*

To enable data replication on Azure Blob storage:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Target, select “Azure Blob Storage”.

The screenshot shows a dark-themed window titled "Replication Target". It contains a list of radio buttons for selecting a replication target. "Azure Blob Storage" is selected. Below the list, there is a text prompt: "Specify the blob endpoint, container, account name and account key for Azure Blob Storage:". This is followed by four input fields: "Blob Endpoint:", "Account Name:", "Account Key:", and "Container for volume TboxRAID010 :". At the bottom of the window is a button labeled "Verify and Apply Settings".

3. In the fields below, enter the following:
 - In “Blob Endpoint”, enter the URL of the blob storage endpoint, also adding the protocol type you will use for access to it - http or https;

For example, if your Blob endpoint URL is mystorageaccount.blob.core.windows.net and you access it through https protocol, enter:

https://mystorageaccount.blob.core.windows.net

- In “Account Name”, enter the name of your account for the Azure service;
- In “Account Key”, enter the key for your account for the Azure service;

Tiger Bridge Replication and Tiering

- In “Container for volume”, enter the name of the container on the Azure blob storage for each shared volume, on which you want to enable replication;

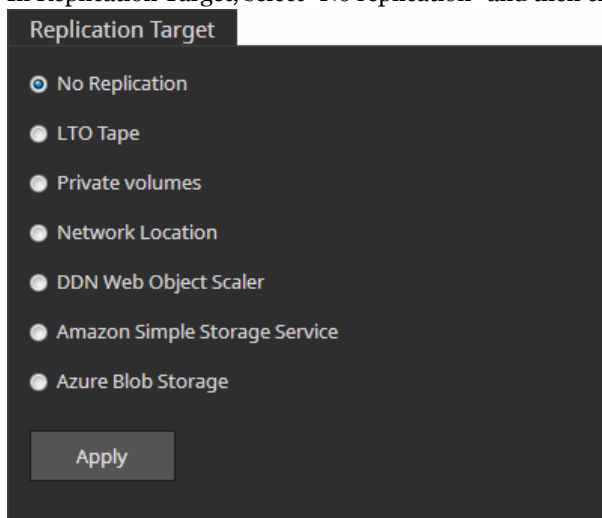
4. Click Verify and Apply Settings.

In case Tiger Bridge cannot verify any of the settings you have specified, it displays an error message and prompts you to re-configure any of these settings that might not have been configured correctly.

Important: *Until you specify criteria for the replication policy, Tiger Bridge uses the default settings - no data is replicated. For more information about specifying the replication settings, refer to "Data Replication Policy" on page 76.*

To disable data replication:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Target, select “No replication” and then click Apply.



Data replication is disabled.

Data Replication Policy

The replication policy governs what data on the shared storage should be copied to the replication target. Tiger Bridge chooses what data to replicate based on two parameters - where this data is stored (all data on the shared volume, all data except data in specific folders or just data in specific folders) and for how long it has not been modified (by default, data not modified within the last 12 hours). Any file that matches the criteria is queued by Tiger Bridge for replication. Tiger Bridge processes the replication queue (i.e. copies files from the queue to the replication target) only when

the traffic to the storage remains low (below 100 MB/s) for at least 10 minutes. Should Tiger Bridge detect I/O activity above this threshold, the replication is paused until traffic remains low again.

Note: *System files and hidden files are not replicated automatically even if they meet the policy criteria.*

Any file that has been modified after it has been replicated is again subject to replication once it matches the replication policy criteria.

You can change the replication policy settings at any time. The new settings will be valid for the next time Tiger Bridge scans the shared volumes for data to replicate.

Setting replication policy parameters:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication Options, do one of the following:

Replication Options

Select what you want to replicate. You can choose between copying everything or nothing and then fine tune your selection using the Exceptions list below.

☐ Replicate everything

If you want to replicate most of the data on this appliance with a few exceptions, select the Replicate everything option and then add the files and folders you want to exclude from replication to the Exceptions list.

☒ Do not replicate

In case you need to replicate only specific files and folders, select the Do not replicate option and then add the files and folders you want to replicate to the Exceptions list.

Exceptions List:

<TboxRAID010>\.tt_ps_\projects\ffffffffffff
<TboxRAID010>\444

Add ...
Remove

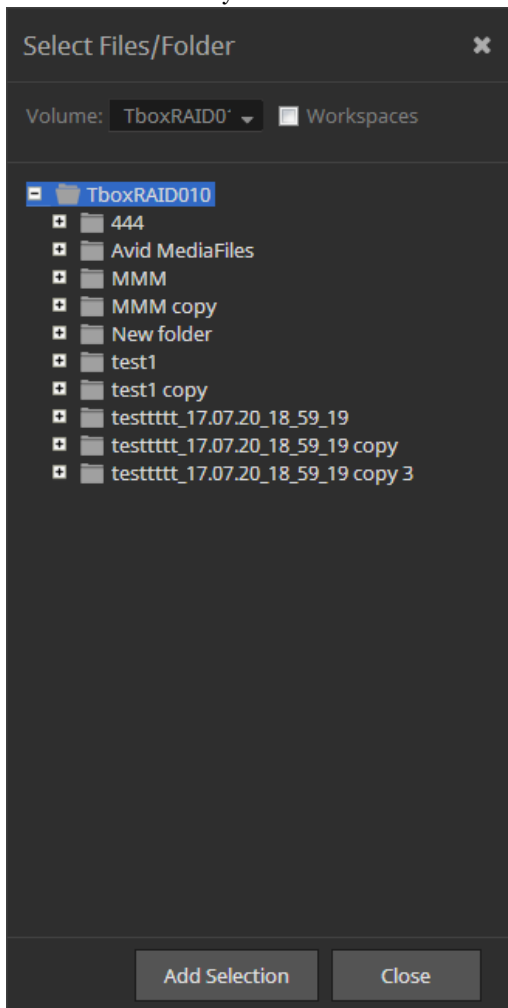
Apply

Tiger Bridge Replication and Tiering

- Select “Replicate everything” to let Tiger Bridge replicate all matching files, except the ones you specify as exceptions (see next step).
- Select “Do not replicate” to instruct Tiger Bridge that it needs to replicate only files that you have added to the exceptions list (see next step).

3. In Exceptions List, click Add.

4. In the dialog, browse to and select a file or a folder and click Add Selection to add them to list of exceptions for the replication option you have selected above. You can add as many files and folders to the list as you like.



Note: *To add Tiger Spaces workspace(s) to the Exceptions list, select the "Workspaces" check box next to the Volume drop-down box and then select the Tiger Spaces folder. To switch the view back to other contents of the volume, clear the "Workspaces" check box.*

For example, if you have selected "Replicate everything" and add a folder Drafts to the list of exceptions, Tiger Bridge will omit all files located in the folder Drafts. Or, if you have selected "Do not replicate" and add to the exceptions list a folder "Final", containing just the final versions of the files you've been working on, Tiger Bridge will replicate only files in this folder and none of the files in the other folders on the shared volumes.

Note: *To remove a file/folder from the exceptions list, select it in the list and click Remove.*

5. When finished with the exceptions list, click Close.
6. In Replication Options, click Apply.

7. In Replication and Tiering Policy/“Wait [specified time], before replicating modified files”, specify for how long a file should not have been modified for Tiger Bridge to replicate it, by entering the desired number and selecting the unit of measure in the drop-down box beside it.

The screenshot shows a configuration window titled "Replication and Tiering Policy". It contains several settings: a "Wait" field set to "5" with a "minutes" dropdown, followed by the text "before replicating recently modified files."; a "Note" stating "Only new or modified files will be replicated."; a checked checkbox for "Reclaim space" with a descriptive paragraph about automatic deletion of data meeting criteria; another "Note" stating "Only data that is already copied to the replication target will be deleted."; a "Remove files" section with settings for "1" hour and "100" MB; a "Start reclaiming space" section set to "0" %; an "Ignore the access time criteria" section set to "95" %; and a final note about file processing order. An "Apply" button is at the bottom.

Replication and Tiering Policy

Wait before replicating recently modified files.

Note: Only new or modified files will be replicated.

☒ Reclaim space

Data that is copied to the replication target and meets the specified criteria will be deleted automatically. A stub file is created for each deleted file. The process preserves the contents of folders saving space.

Note: Only data that is already copied to the replication target will be deleted.

Remove files that were not accessed for more than and are bigger than

Start reclaiming space when used space exceeds % of total capacity.

Ignore the access time criteria if used space exceeds %.

Files accessed long time ago will be processed before more recently accessed files.

For example, to set Tiger Bridge to replicate files that have not been modified in the last 2 weeks, enter the number “2” and then select “weeks” in the drop-down box.

8. In Replication and Tiering Policy, click Apply.

Manage Replicated Data

By default, replicated data is available on both the Tiger Store volumes and the replication target. Even if a Tiger Client deletes a replicated file from the shared storage, its copy on the replication target is not deleted. You can permanently delete it in the Volume Browser (see “Manage Data in The Volume Browser” on page 84).

To minimize used storage and duplicated data, Tiger Bridge offers you a mechanism for reclaiming space on its volume(s) by automatically deleting files that already exist on the replication target, but keeping the path to them on the replication target. Similar to the replication policy, this mechanism operates using simple criteria that tell Tiger Bridge what already replicated data should be removed from the shared volume, leaving just its copy on the replication target. Deleted data is still accessible to users and applications by using the same paths, as if it has not moved. This is achieved by creating a stub file in the place of each replicated file that is deleted from the shared volumes. Should a user or application attempt to access a deleted replicated file, Tiger Bridge automatically replaces the stub file with its original counterpart from the replication target. When you restore a file from a SMB/CIFS network share or a Private volume as a replication target, you can even begin reading the file before it is fully restored.

While the replication and reclaiming space operations are performed automatically in the background, Tiger Bridge provides you with user friendly interface (the Volume Browser) to manually copy data on the replication target or manually restore a file from the replication target to the shared volumes. For more information refer to “Manage Data in The Volume Browser” on page 84.

Specify Reclaiming Space Criteria

Basically, you can specify two parameters based on which Tiger Bridge to reclaim space by deleting replicated files from the shared volume - minimal file size and time interval for which the file has not been accessed. For example, if you set the file size threshold to 1GB and the time interval to 2 weeks, Tiger Bridge will replace with stubs the replicated files with size 1GB or above that have not been accessed for at least 2 weeks, leaving on the Tiger Store volume replicated files whose size is smaller than 1GB and replicated files with bigger size that have been accessed by a client computer in less than 2 weeks.

Note: *Tiger Bridge doesn't create stub files for files whose size is equal or less than the size of the file system cluster (64Kb) as they take the same or less space as the stub files themselves.*

Additionally, you can instruct Tiger Bridge to enforce the reclaim space policy only if used space on the Tiger Store volume exceeds a specified threshold. You can also instruct Tiger Bridge to queue for deletion all replicated files (regardless of their last access time, starting with the ones that have been least recently accessed), if the used space reaches a specified limit.

You can enable and disable space reclaiming at any time. Even after you disable space reclaiming, attempting to access a stub file will restore the original file from the replication target as long as it is still accessible to the storage server.

To enable space reclaiming:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In Replication and Tiering Policy, select the “Reclaim space” check box and click Apply.

Replication and Tiering Policy

Wait minutes before replicating recently modified files.

Note: Only new or modified files will be replicated.

☒ Reclaim space

Data that is copied to the replication target and meets the specified criteria will be deleted automatically. A stub file is created for each deleted file. The process preserves the contents of folders saving space.

Note: Only data that is already copied to the replication target will be deleted.

Remove files that were not accessed for more than hours and are bigger than MB

Start reclaiming space when used space exceeds % of total capacity.

Ignore the access time criteria if used space exceeds %.

Files accessed long time ago will be processed before more recently accessed files.

Until you change the criteria for space reclaiming, Tiger Bridge uses the default settings.

To disable space reclaiming:

1. In the left pane of Tiger Store’s web interface, click System and then Replication & Tiering.
2. In Replication and Tiering Policy, clear the “Reclaim space” check box and click Apply.

Space reclaiming is disabled for the Tiger Store volume and unless you manually delete a replicated file from the shared storage, it exists on both the Tiger Store volume(s) and the replication target.

Note: Even after you disable space reclaiming, attempting to access a stub file will restore the original file from the replication target as long as it is still accessible to the storage server.

To set the criteria for space reclaiming:

1. In the left pane of Tiger Store’s web interface, click System and then Replication & Tiering.
2. In Replication and Tiering Policy, do the following:

Replication and Tiering Policy

Wait minutes before replicating recently modified files.

Note: Only new or modified files will be replicated.

☒ Reclaim space

Data that is copied to the replication target and meets the specified criteria will be deleted automatically. A stub file is created for each deleted file. The process preserves the contents of folders saving space.

Note: Only data that is already copied to the replication target will be deleted.

Remove files that were not accessed for more than hours and are bigger than MB

Start reclaiming space when used space exceeds % of total capacity.

Ignore the access time criteria if used space exceeds %.

Files accessed long time ago will be processed before more recently accessed files.

Apply

- In “Remove files that were not accessed for more than”, specify the minimum time before a replicated file has been accessed for it to be replaced by a stub file and specify the minimum size of the files that should be replaced by stub files as long as they are already copied to the replication target.

Tip: Use the drop-down box on the side, to change the unit of measure.

- In “Start reclaiming space when used space exceeds”, enter the percent of used space on the Tiger Store volume, which, when exceeded, should trigger space reclaiming.

Tip: Enter 0% to start space reclaiming regardless of the used space on the Tiger Store volume(s).

- In “Ignore the access time criteria, if used space exceeds”, enter the percent of used space on the Tiger Store volume, which, when exceeded, should trigger deletion of all already replicated files regardless of their size and the time they were last accessed.

3. Click Apply.

Manage Data in The Volume Browser

The Volume Browser is the place where you can explore data on the shared Tiger Store volumes and manually replicate files (or whole folders), create stub files, restore files from the replication target or delete files.

Important: *When you delete a replicated or offline file in your file browser, you only delete it from the shared volume, but its replicated counterpart remains on the replication target. To permanently delete a file from both the shared volume and the replication target, you should perform the operation in the Volume Browser.*

Initiating a task in the Volume Browser always takes precedence over the automatically scheduled tasks. That means that if you choose to manually replicate files through the Volume Browser, the execution of the operation will begin immediately (in contrast to automatic replication, which waits for low traffic to the storage to begin processing the replication queue) and will probably pause the automatic replication queue that is being processed at the moment.

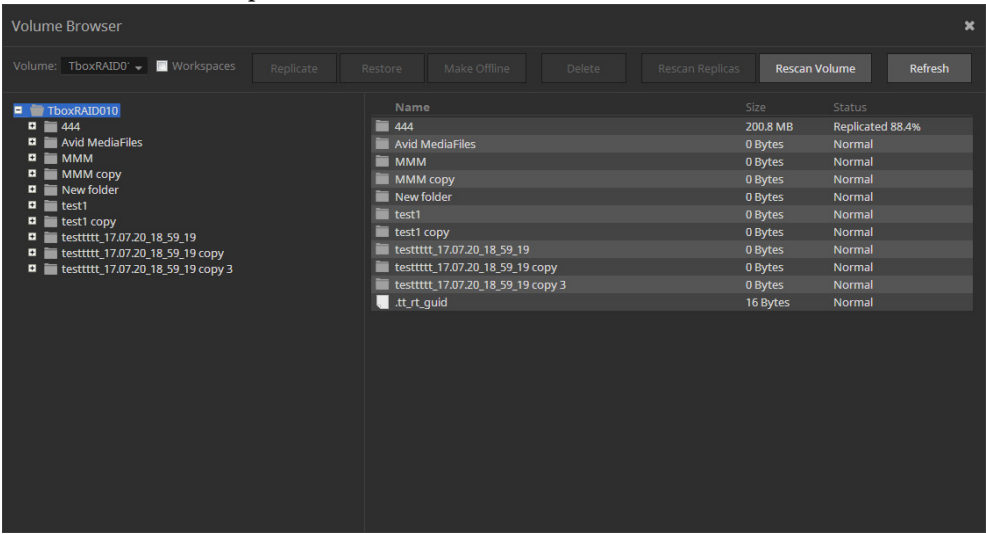
Note: *The Volume Browser hides system files such as files associated with the Recycle bin, volume icons, etc.*

To access the Volume Browser:

1. In the left pane of the web interface, click System and then Replication & Tiering.
2. In the Replication & Tiering page, click Browse.

Tip: You can also open the Volume Browser, by clicking Browse in the tile of a volume.

The Volume Browser opens.



The left pane allows you to navigate the tree structure of the contents of the volume selected in the drop-down box.

Note: To explore or manage Tiger Spaces data on the selected volume, select the "Workspaces" check box next to the Volume drop-down box. To switch the view back to other contents of the volume, clear the "Workspaces" check box.

By expanding the node of a folder, you can view its hierarchical structure. Clicking an item in the tree view, displays its contents in the right panel.

The file operations you can perform in the Volume Browser depend on the status of the selected file:

normal — a file that doesn't have a copy on the replication target or a file that has been modified after its last replication (i.e. is subject to replication again);

replicated — a file that is replicated and exists on both the Tiger Store volume and the replication target;

offline — a stub file i.e. a file that has been replicated and then has been deleted from the Tiger Store volume in order to reclaim space.

Depending on the status of a selected file, you can perform the following operations:

File status	Replicate	Restore	Make offline	Delete
replicated	YES	-	YES	YES*
normal	YES	-	-	YES
offline	-	YES	-	YES*

* if you delete a replicated or offline file, you are also permanently deleting its copy on the replication target.

You can select a folder to perform the desired operation on all matching files in that folder i.e. for example, clicking Restore for a selected folder will restore all offline files in that folder.

Important: Attempting to start manual replication before the previous manual replication task has been completed will fail. It is advisable to run manual replication only after making sure that previous manual replication tasks are fully completed (the files are with "replicated" status in the Volume Browser).

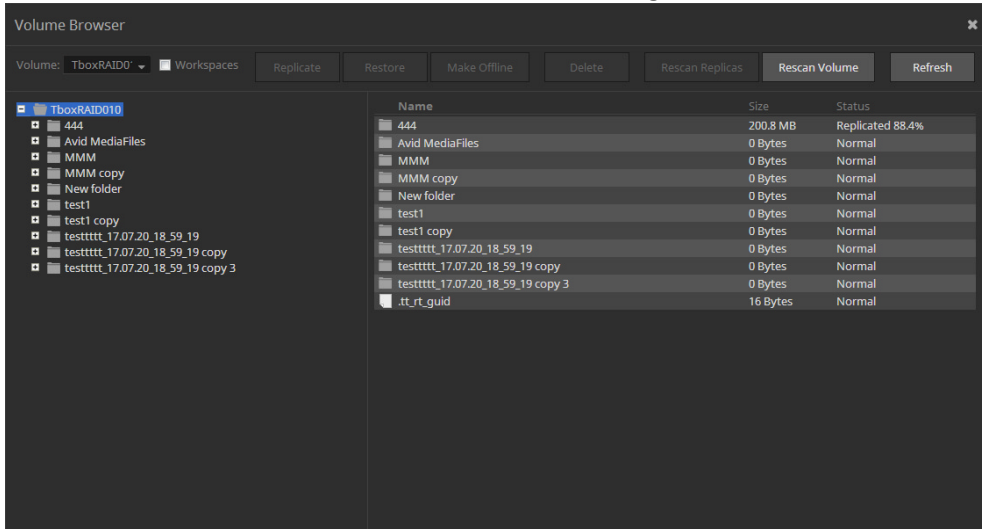
Re-scanning Replicated Data

There are some situations in which a replicated file can have no offline counterpart on the Tiger Store volume. To allow you to create a stub file for each file existing on the replication target, Tiger Bridge provides you with a mechanism for re-scanning the replicated data. When a replicated file, which doesn't have a stub file on the Tiger Store volume, is detected, Tiger Bridge automatically creates the stub file in the source folder.

You can re-scan the whole volume, on which Data Replication is enabled or just a folder on it.

To re-scan replicated data:

1. Open the Volume Browser (see page 84).
2. In the taskbar of the Volume Browser, do one of the following:



- Click Rescan Volume, to re-scan the whole volume that is selected in the drop-down box of the Volume Browser.
 - Browse to and select the folder, whose contents you want to re-scan and then click Rescan Replicas.
3. Tiger Bridge scans the selected location and if it finds a file that doesn't have a stub counterpart on the Tiger Store volume, creates a stub file in the source folder.

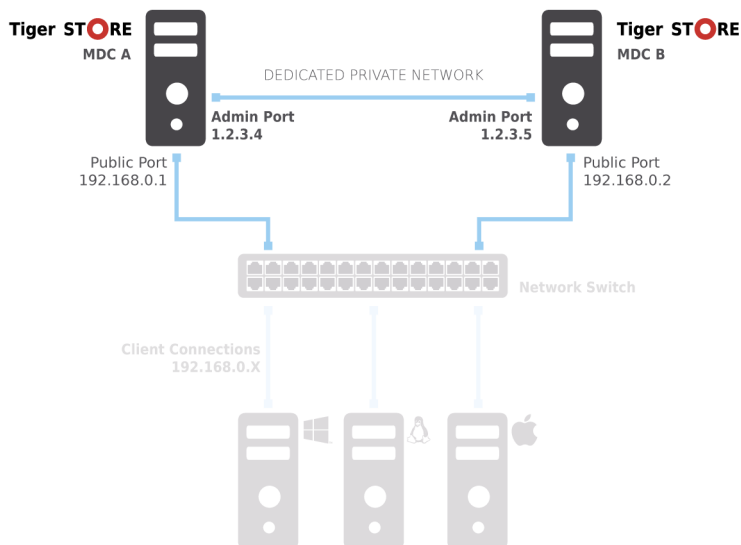


Manage High Availability

<i>Monitor Server Nodes Synchronization</i>	<i>91</i>
<i>Resolve Conflicting Settings in Node View</i>	<i>91</i>

Manage High Availability

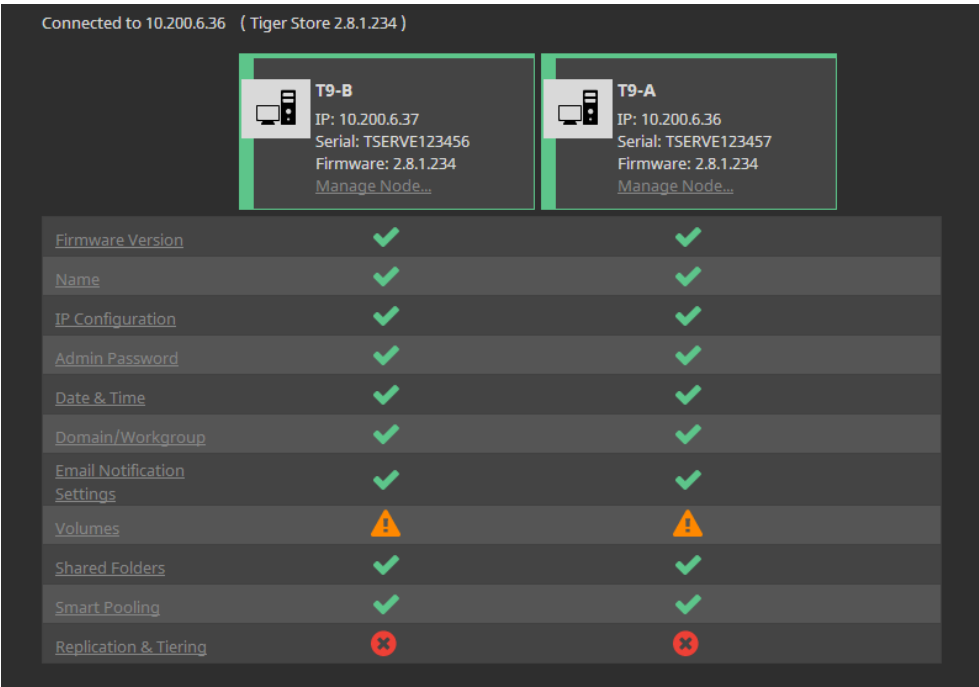
To be able to provide constant availability to the shared storage, the two server nodes of your Tiger Store storage server (be it an appliance with two server nodes or two computers acting as a high availability cluster) must be online and have identical settings.



Tiger Store is designed in such a way that changes introduced in the cluster view of the web interface are automatically synchronized among the server nodes as long as both of them are online. While you can rely on the automatic synchronization of settings between server nodes for most settings, some settings (like firmware version and Tiger Store activation, for example) cannot be automatically synchronized on both server nodes. Additionally, should you add a second server node after all the settings have already been configured, you may have to synchronize the secondary node's settings manually.

Monitor Server Nodes Synchronization

The HA Nodes page in the web interface allows you to monitor the settings synchronization among nodes.



It displays the tiles of the available server nodes and a table comparing their settings:

- ✓ - settings are synchronized;
- ⚠ - conflicting settings of the two server nodes, but failover can take place;
- ✗ - critical conflict in settings that doesn't allow failover to take place;

To resolve conflicting settings, you will have to access the node view of one or the other nodes and manually change the conflicting setting of the selected node.

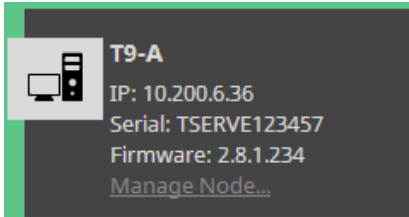
Resolve Conflicting Settings in Node View

To apply changes on a specific server node only, you should access the node view of the web UI, which displays just the information valid for the node, but not for the cluster. The purpose of the node view is to allow you to resolve conflicts in those settings of the two nodes that cannot be synchronized automatically in cluster view (like Tiger Store activation, firmware version, etc.).

Important: When accessing the node view of the web interface, make sure you don't introduce changes that may lead to conflicts between the two server nodes.

To access the node view of the web UI:

1. In the left pane of the web interface, click HA Nodes.
2. In the tile of the server node, whose web UI you want to access, click Manage Node.



The node view for the selected server node opens in a new tab/window of your web browser.

3. Click Manage and then enter the password for the web interface.

Tip: If you have changed the password for the cluster view of the web interface, while this node has been online - enter the new password. In other cases enter the default password - **admin**.



System Maintenance

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System Maintenance

The following options facilitate you in maintaining and monitoring the Tiger Store system:

- Tiger Store reboot options.
- enabling remote access to a Tiger Store appliance.
- Tiger Store appliance firmware update.
- backing up and restoring the Tiger Store configuration of an appliance.
- e-mail notifications for problems.
- viewing events reports.

Tiger Store Reboot Options

To facilitate you in performing certain tasks and in order not to obstruct users work with the appliance, Tiger Store offers you several reboot options.

You can issue the following commands:

- Restart add-on services - restarts all add-on services, installed on the storage server (like auto defragmentation, Tiger Bridge, etc.).
- Restart all services - restarts all Tiger Store services and starts them in the correct order, clients are disconnected from the storage server.
- Full System reboot - Tiger Store automatically disconnects any connected client computer and shuts down, then starts again. Once the system is up again, the web interface is automatically refreshed.

Note: *After restarting the appliance, client computers are not automatically reconnected to it.*

- Shutdown - Tiger Store automatically disconnects any connected client computer from the storage server and shuts it down.

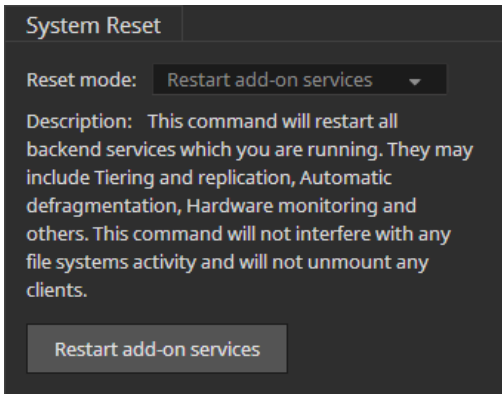
Note: *On Tiger Store with high-availability add-on activated, when the respective reboot option is issued in cluster view of the web interface, it applies to both server nodes, and when you issue the command in node view, it applies to the selected server node only.*

Whenever you need to restart or shut down a Tiger Store appliance, it is advisable to do it from the web interface, instead of pressing the Power or Reset buttons on the back of the appliance.

Important: *Some of the Shut down and Reboot commands are not available when maintenance operations such as Firmware Update are going on at the moment.*

To issue a reboot option command:

1. In the left pane of the web interface, click System and then Maintenance.
2. In System Reset, select the desired option in the drop down box and then click the button below to issue the selected command.



Tip: The button below the drop down box changes according to the selected command.

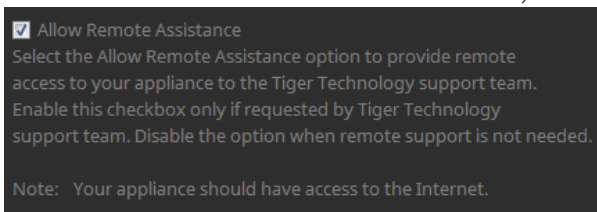
Enable/Disable Remote Access to the Appliance

For some maintenance operations you may need the assistance of the Tiger Technology support team. To facilitate them in diagnosing the problem and resolving it, you may have to provide remote access to the appliance. This is done by enabling the pre-installed software for remote assistance.

Enable remote access to the appliance only if requested by Tiger Technology support team. Disable the setting once remote support is no longer needed.

To disable/enable remote access to the appliance:

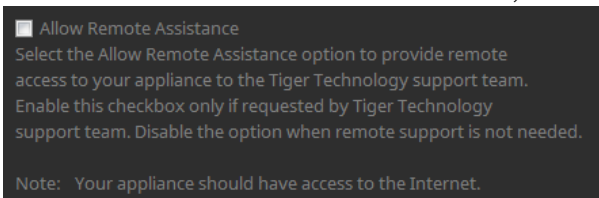
1. In the left pane of the web interface, click System and then About.
2. Do one of the following:
 - Select the “Allow remote assistance” check box, to enable remote access to the appliance.



System Maintenance

Note: Remember to disable this option once your remote session with Tiger Technology support finishes.

- Clear the “Allow remote assistance” check box, to disable remote access to the appliance.



Firmware Update of the Appliance

You can use the web interface of Tiger Store to update the appliance firmware. You can check the current firmware version in the About page of the web interface.

Note: On appliances with two server nodes, you should check the current firmware version of each node in Node view.

Once you receive a firmware update, it is advisable to upload it on your appliance to guarantee its good functionality. The procedures for performing a firmware update on your appliance differ depending on whether it features two server nodes or just one. Both server nodes should run the same firmware version in order to act as a high availability cluster.

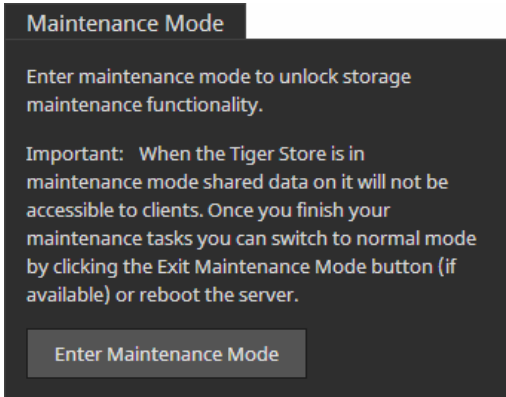
Some firmware updates require that the Tiger Client software also be updated on client computers.

You can update the firmware, when no client computer is connected to the appliance and no other maintenance operation is going on at the moment. That is why before updating the firmware you should enter Maintenance mode, which disconnects all client computers.

To upload a firmware update on an appliance with one server node:

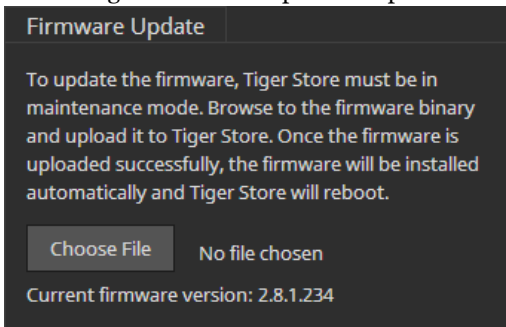
Important: The process of firmware update cannot be interrupted or paused. Do not shut down or restart the appliance after a firmware update has begun.

1. In the left pane of the web interface, click System and then Maintenance.
2. Click Enter Maintenance mode and then confirm that you want to enter Maintenance mode.



Important: *All connected Tiger Clients will be automatically disconnected from the shared volumes and any file operation going on at the moment will be canceled.*

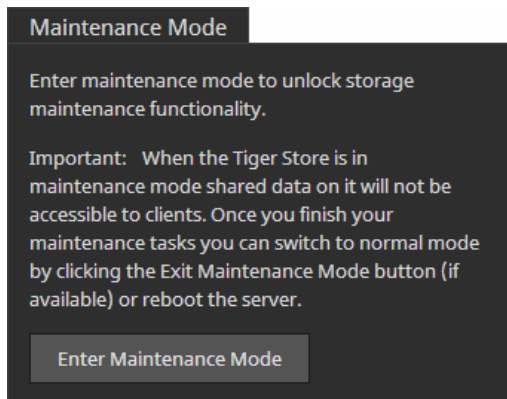
3. In Firmware Update, click Browse/Choose File and then browse for and select the file containing the firmware update to upload.



4. Click Continue to confirm that you want to perform firmware update.
Tiger Store uploads the firmware on the system hard drive, unpacks it and applies the firmware update. When the firmware update finishes, the system automatically restarts.

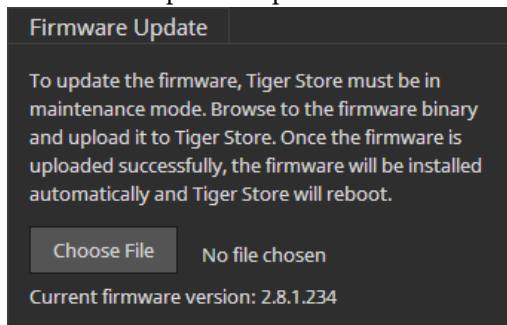
To upload a firmware update on an appliance with two server nodes:

1. In the left pane of the web interface, click System and then Maintenance.
2. Click Enter Maintenance mode and then confirm that you want to enter Maintenance mode.



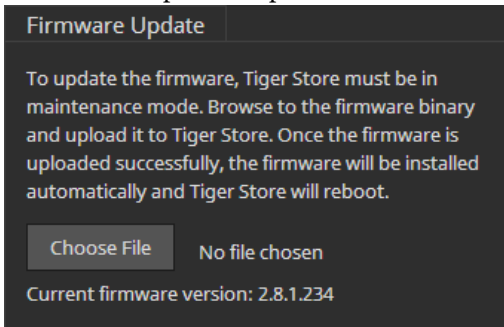
Important: All connected Tiger Clients will be automatically disconnected from the shared volumes and any file operation going on at the moment will be canceled.

3. In the left pane, go to HA Nodes and in the tile of each server node, click Manage Node.
The node view of each server node opens in a new tab/window of your web browser.
4. In the node view of the first server node, go to System | Maintenance.
5. In Firmware Update, click Browse/Choose file and then browse for and select the file containing the firmware update to upload.



6. Click Continue to confirm that you want to perform firmware update.
7. In the node view of the second server node, go to System | Maintenance.

8. In Firmware Update, click Browse/Choose file and then browse for and select the file containing the firmware update to upload.



9. Click Continue to confirm that you want to perform firmware update.
When the firmware update finishes, both server nodes automatically restart.

Back Up/Restore the Tiger Store Configuration

To facilitate you when upgrading your Tiger Store appliance, Tiger Store allows you to back up and then restore all settings configured in the web interface, thus sparing you the effort to configure them again. When you restore a previously backed up configuration, you restore all settings for appliance name, shared, offline and private volumes (identified by volume GUID), default volume mount point on Windows Tiger Clients, auto-defragmentation, smart storage pooling, domain settings, Tiger Bridge settings, IP configuration, except the names of the volumes seen by the storage server.

Note: *Tiger Store doesn't back up and restore the password for the web interface, but keeps the last used password.*

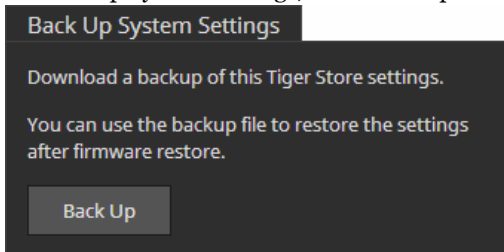
On Tiger Store appliances with high-availability add-on activated, to ensure the consistency of the backup file, Tiger Store allows you to back up and restore the settings configuration only if both server nodes are online. This way, when you restore a backed up configuration, there's no need to restore it on each node - Tiger Store takes care to restore and synchronize the settings on both nodes.

By default, the file with the backed up configuration is saved with the following name: [storage server name]_[time]_[date]_backup.json. You can create as many backups as you want and change their name to make it easier for you to discern between one another as long as you keep their extension (.json). To provide protection of sensitive information in the configuration backup file, Tiger Store encrypts it. Additionally, you can ensure that no unauthorized user restores a backed up configuration file by protecting the backup file with a password.

Important: Restoring a backed up settings configuration automatically disconnects all Tiger Clients and restarts the storage server computer.

To back up the Tiger Store settings configuration:

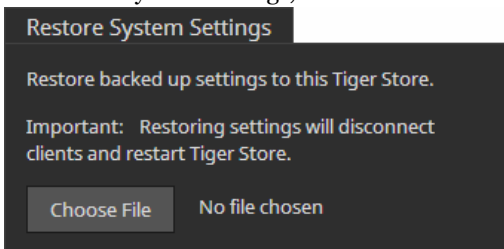
1. In the left pane of the web interface, click System and then Maintenance.
2. In Back Up System Settings, click Back Up.



3. Do one of the following:
 - Leave the password field empty and click OK, to be able to restore the settings configuration without providing password.
 - Enter a password and click OK, to allow restoring the settings configuration only after providing a password.
4. Select the location where to save the file and click Save.

To restore a Tiger Store settings configuration:

1. In the left pane of the web interface, click System and then Maintenance.
2. In Restore System Settings, click Choose File.



3. Select the file and click Open.
4. Do one of the following:
 - Leave the password field empty and click OK, to restore a settings configuration, which isn't password protected.
 - Enter a password and click OK, to restore a settings configuration protected with a password.

5. Tiger Store automatically disconnects all Tiger Clients and after importing the selected backup file restarts.

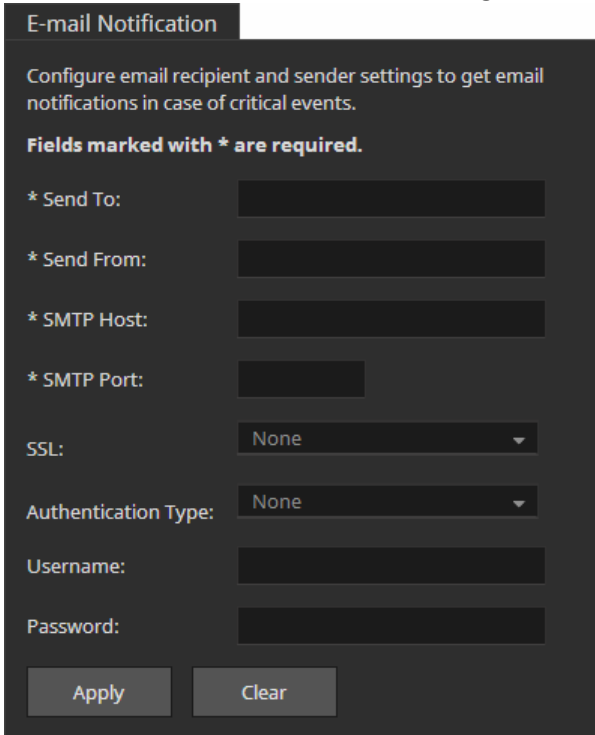
Configure E-mail Notifications

Tiger Store offers you the opportunity to receive mail notifications each time there's a problem with the shared volumes. The notifications give you detailed information about the storage status and the exact disk that has failed. To benefit from the e-mail notifications, besides specifying the mail account(s) to which the notifications to be sent, you must also specify an e-mail account from which these notifications to be sent. This account must be managed by a mail server to which Tiger Store is connected via the Public port or another Ethernet port. It is advisable to let the system administrator set the notification settings as you will also need the password, SMTP host, SMTP port, SSL and authentication type details of the account from which the notifications will be send. Your system administrator can create a new e-mail account specifically for the purposes of sending e-mail notifications from Tiger Store.

You can enable/disable e-mail notifications at any time, keeping in mind that each time you disable them, you lose all e-mail notification settings you have specified.

To enable/disable e-mail notifications:

1. In the left pane of the web interface, click Settings.
2. In E-mail Notification, do one of the following:



The screenshot shows a dark-themed web interface for 'E-mail Notification'. At the top, there's a title bar 'E-mail Notification'. Below it, a subtitle reads 'Configure email recipient and sender settings to get email notifications in case of critical events.' A note states 'Fields marked with * are required.' The form contains several input fields: '* Send To:', '* Send From:', '* SMTP Host:', '* SMTP Port:', 'SSL:' (with a dropdown menu showing 'None'), 'Authentication Type:' (with a dropdown menu showing 'None'), 'Username:', and 'Password:'. At the bottom, there are two buttons: 'Apply' and 'Clear'.

- To enable e-mail notifications or edit the e-mail notifications settings, enter the needed information in the respective fields and click Apply.

Note: In case you want to set more than one e-mail account to receive notifications, in the Send To field enter the respective e-mail accounts separated by commas.

Tip: To verify that you have correctly specified the e-mail notification settings, click Send Test Message and check the Inbox of the mail account for the test message.

- To disable e-mail notifications, click Clear and then Apply.

View Event Reports

In the web interface you can view detailed reports about events regarding the shared volumes, a Tiger Client or all Tiger Clients within a selected time period. You can filter the events by three categories - informations, warning and errors.

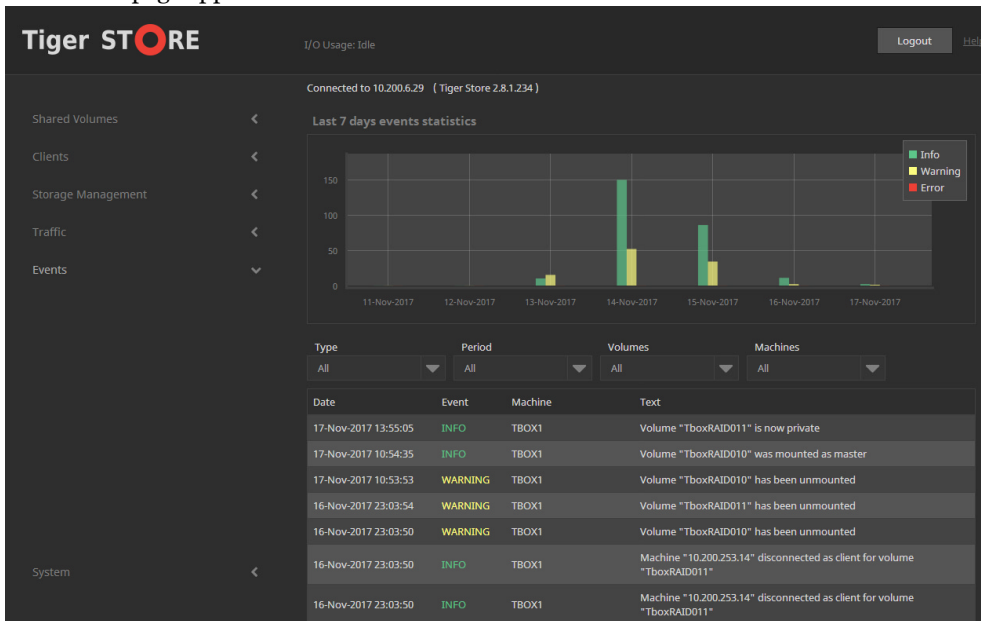
Note: You can generate Event reports, only if you are currently connected to the storage server for which you generate the report.

To generate an event report:

1. In the left pane of the web interface, click Events.

Tip: On Tiger Store with high-availability add-on activated, to view events report for a specific server node only, open its node view in the web UI.

The Events page appears.



2. In the Type drop-down box, select whether to generate a report about all events or filter it to specific type only.
3. In the Period drop-down box, select the time period for which to generate the report.
4. In the Volumes drop-down box, select whether to generate report for a selected volume only or for all volumes.
5. In the Machines drop-down box, select whether to generate a report about all machines or filter it to a specific computer only.

The Events page displays graphs with the event types by date and below lists all events in descending order.

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