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Paragon ExtFS for Mac OS X™

User Manual

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Introduction

Paragon ExtFS for Mac OS X™ is a low-level file system driver specially developed to bridge incompatibility of Linux and Mac OS X by providing full read/write access to the Ext2, Ext3 and Ext4 file systems under Mac OS X.

Based on the Paragon UFSD™ (Universal File System Driver) technology our driver enables to provide fast and transparent access to ExtFS partitions as Mac OS X-native, thus achieving an unprecedented high level of performance (the same as for HFS Plus and in some cases even better). Mac OS X programs can process such partitions without any restrictions – browse contents, read and modify files, copy and create new files and folders, etc.

Paragon ExtFS for Mac OS X comes in one universal binary edition in the form of a standard DMG disk image that includes user manual and installation/uninstallation files to automatically install/uninstall and configure the ExtFS driver. During installation of the driver two powerful utilities to create/format and check/repair Ext2, Ext3 and Ext4 file systems will be integrated into the Disk Utility.

In this manual you will find the answers to many of the technical questions, which might arise while using our driver.



Our company is constantly releasing new versions and updates to its software, that's why images shown in this manual may be different from what you see on your screen.

Features Overview

This chapter dwells upon key benefits and technical highlights of the product.

Key Features

Let us list some of the key features:

- **Extremely easy to use** as it requires no additional configuration after installation
- **Fast and transparent access to any [ExtFS](#) (Ext2,Ext3 or Ext4) partition under Mac OS X**
- **Advanced driver engine** to guarantee reliable operation and stability even under heavy workload
- **Unprecedented high level of performance** thanks to the [Paragon UFSD™ technology](#)
- **[Advanced support system](#)** to help you submit correct support requests with operation logs and all necessary information with minimal time and effort
- **Complete support of Mac OS X 10.8 Mountain Lion, 10.9 Mavericks, 10.10 Yosemite, [10.11 El Capitan](#)**
- **Advanced support of the [HFS Plus file system](#) features** to guarantee data consistency (POSIX file attributes, [Hardlinks](#), [Symlinks](#), [Data Fork](#) and [Resource Fork](#), etc.)
- **Advanced support of the ExtFS file system features** to guarantee data consistency ([Hardlinks](#), [Symlinks](#))
- **[Improved product activation](#)** that includes online and offline options
- **[Flexible notification system](#)**
- **Support of Mac OS X extended attributes**
- **Support of non-Roman characters**

What's New

- Added support of almost all Ext4 features, except for bigalloc, journal_dev, meta_bg
- Better performance for small files, random read/write operations, volumes with little free space
- Much faster disk mounting/unmounting
- Fixed issues with hardlinks and aliases
- Rock-solid stability under extreme loads
- Improved command-line utilities that now can format huge volumes and volumes with Ext4-specific options, check and repair volumes with Ext4-specific options, etc.

Supported Media

- Ultra high capacity disks (up to 10 TB tested)
- IDE, SCSI and SATA/eSATA disks
- SSD (Solid State Drive)
- Thunderbolt, FireWire (i.e. IEEE1394), USB 1.0, USB 2.0 , USB 3.0, ZIP® and Jazz® disks
- PC card storage devices (all types of flash memory, etc.)

Getting Started

In this chapter you will find all the information necessary to get the product ready to use.

Distribution

Paragon ExtFS for Mac OS X™ is distributed in two ways:

- Boxed package from Paragon Software GmbH and resellers
- Downloadable package over the Internet at the company's web-site

The two contain a standard DMG disk image with an installation package to automatically install and configure the ExtFS driver.

Thus in order to get the product ready for use, you need to install it first (see [Installing the Driver](#)).



ExtFS for Mac OS X is a commercially distributed product, which is however can be used with no limitations completely for free during a 10-day trial period. Once it's over, you won't be able to use the product until you activate it through [Preferences Pane](#).

Registration

Paragon Software GmbH provides a wide range of online services through its web-portal - www.paragon-software.com/support:

- Registration of new users;
- Registration of purchased products for registered users;
- Available around-the-clock downloading center, where registered users can get product updates/upgrades as well as all the necessary documentation;
- Downloadable free demo versions and open documentation for all users.



It is recommended to use Safari, Internet Explorer 5+ or any compatible browser.

To Register as a New User

To register as a new user, please do the following:

1. Run an Internet browser and visit the page: <http://my.paragon-software.com/>
2. Click the **Create an account** hyperlink.

MyParagon Customer Portal

Sign in

[or create an account](#)

[Forgot password?](#)

OR SIGN IN WITH

3. Fill out the registration form. The most important field in the form is an e-mail address, as it serves as a login to enter the system. Besides, an activation link will be sent to this address as well.

Sign up

OR SIGN IN WITH

Already have an account? [Sign in](#)

4. Click **Sign up**. If the provided e-mail address was used to register products in the old Paragon MyAccount system, all data from that account will be migrated to the newly created account.

Sign up

Dear Jim Bubblestone,

We have found that some of your products were registered in the old Paragon MyAccount.

The old Paragon MyAccount is starting to show its age. So we've developed a brand new portal so we can meet current and future requirements for user-friendliness and security and expand our customer service. The old Paragon MyAccount and new MyParagon Portal will exist concurrently for a transitional period.

Please be informed that when you activate your customer account, we will migrate all your account information from the old Paragon MyAccount to the new MyParagon Portal.

Please click Next to proceed.

Next

- Once your account is created, you will be prompted to check your inbox for an email with an activation link.

Sign up

Your Paragon account has been created successfully. Please check your inbox and follow the link to activate your account.

[Sign in](#)

- By following the link from the email you can set a password to your account.

Password Reset

Please set a new password for your account. The password must contain a minimum of 6 characters, at least 1 unique number and at least one unique capital and lowercase letter.

Password Reset

- That is all.

To Register a New Product

If you are a registered user and would like to register Paragon ExtFS for Mac OS X, please do the following:



You can register (activate) the product directly from the [program's interface](#).

- Run an Internet browser and visit the page: <http://my.paragon-software.com/>
- Enter an email and password of your Paragon's account, then click **Sign in**. If the user name and password are valid, you will get to your account.

MyParagon Customer Portal

Sign in

[or create an account](#)

jimbubblestone@gmail.com

.....|

[Forgot password?](#)

Sign in

OR SIGN IN WITH

f Facebook

3. Select **Register new product** in the left pane. Enter your product serial number. You can find it in the product box or obtain from your reseller. Click **Register** when ready.

The screenshot shows the MyParagon Customer Portal interface. On the left is a navigation sidebar with the Paragon Software Group logo at the top. The user is logged in as 'Jim Bubblestone'. The sidebar menu includes 'Product & Services' (expanded), 'My Products', 'Register New Product' (highlighted), 'My Downloads', 'My Upgrades', 'Support', and 'Profile'. The main content area is titled 'MyParagon' and 'Register New Product'. It features a text input field containing a placeholder serial number 'xxxxxx-xxxxxx-xxxxxx-xxxxxx-xxxxxx' and a blue 'Register' button below it.

4. That is all. The product is now registered, which you can see in the **My products** section. Once the product is downloaded and installed, you can unlock it for unlimited use as described in the [Trial Version Activation](#) chapter.

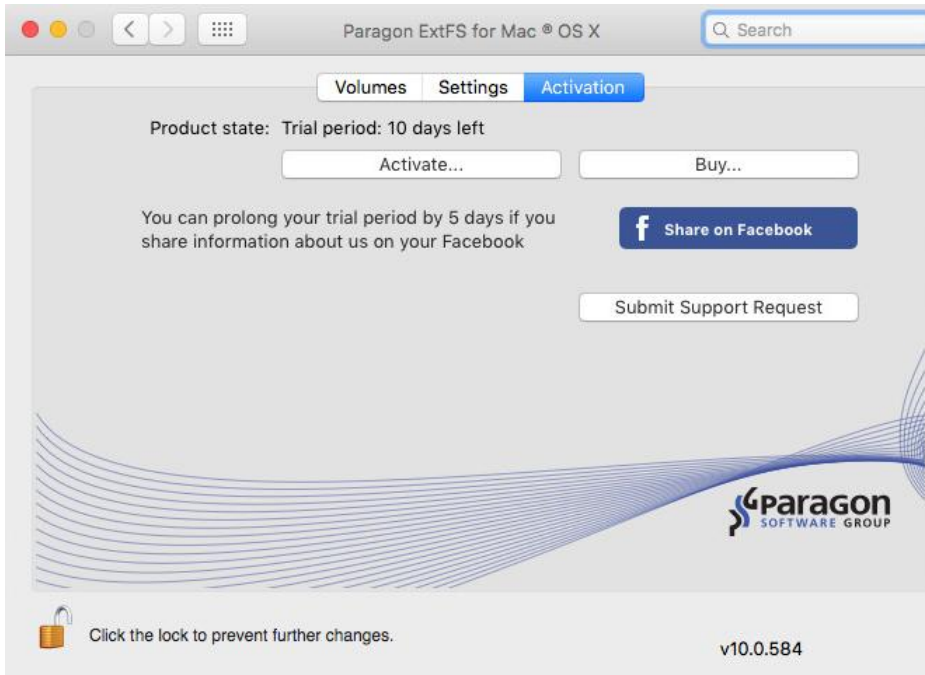
Trial Version Activation

You can purchase and unlock the product for unlimited use at any moment through Preferences Pane. [The recommended procedure](#) requires an active Internet connection and minimal participation from your part. However, if you don't have the Internet on the target computer, you can try [an offline option](#).

Online activation

There are two ways of activating the product over the Internet: [with login to MyParagon Customer Portal or Facebook](#) and [without it](#). We highly recommend you to use the first option to let us offer you personal discounts in the future. Besides, you will be able to issue support tickets directly from the product.

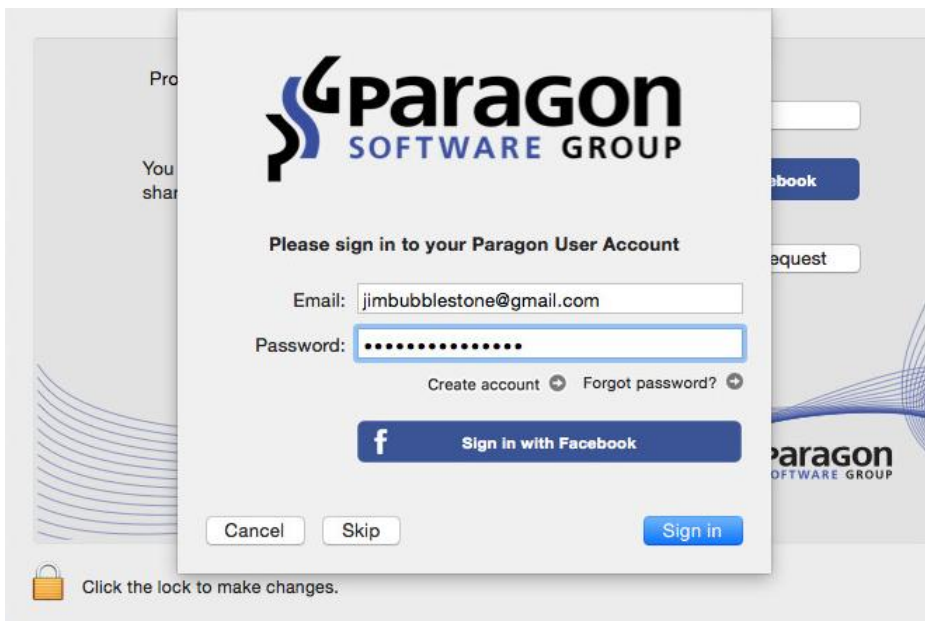
1. First you should purchase the product. The easiest way is to use a direct link located on the EXTFS Preferences Pane:
 - Select **Applications > System Preferences > ExtFS for Mac OS X**;
 - The **Activation** tab is displayed by default. Click on **Buy...**



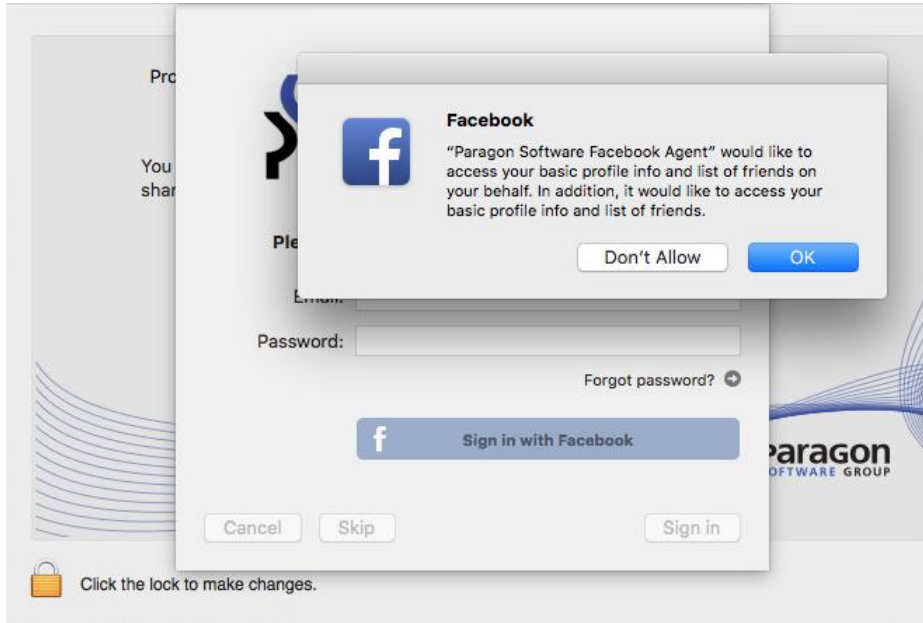
2. By this moment you should have your own serial number. Click on **Activate...**

Activating with login

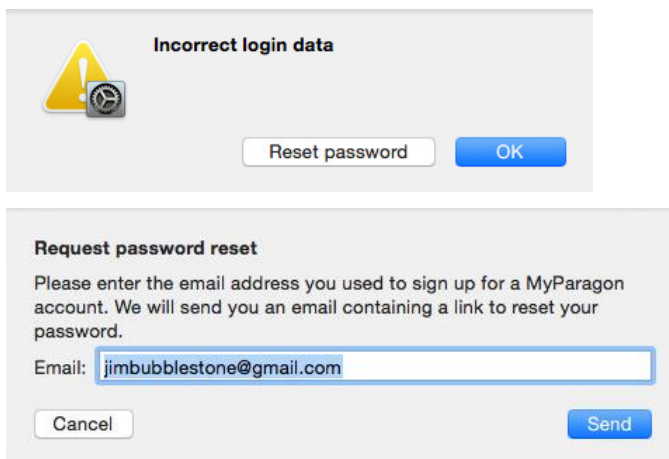
3. In the opened dialog enter an email and password of your Paragon's account, then click **Sign in**. If you don't have an account yet, please create it by clicking the corresponding option.



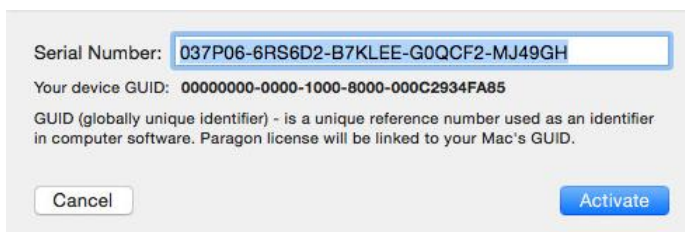
Alternatively, you can sign in with your Facebook account.



4. If the provided credentials are invalid, you will be prompted to reset your password.



5. If you have purchased the product online as described in the first step, then your serial number will be pasted automatically. If having to do with a box version of the product, enter your serial number, then click **Activate**. This info will be sent to our activation server to complete the procedure.

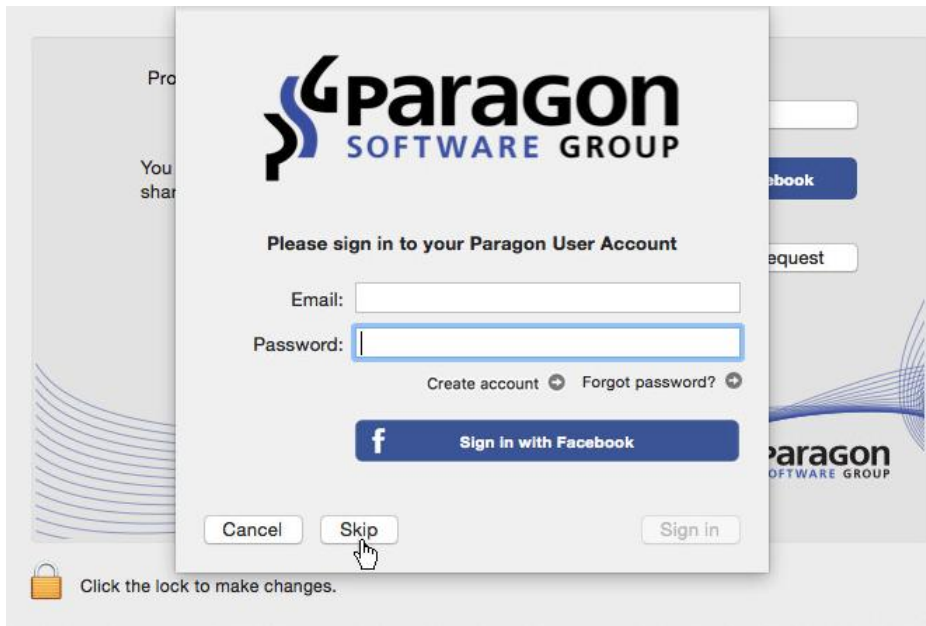


6. Next you are to provide a password of a user with the administrator privilege.
7. If a success, you'll get a corresponding notification.

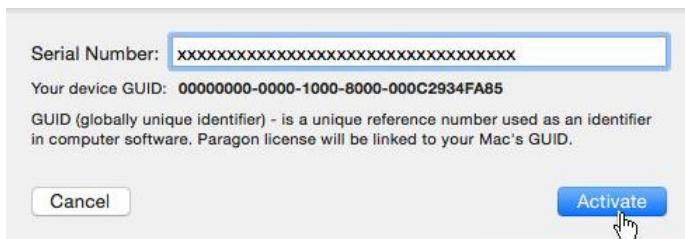


Activating without login

3. In the opened dialog click **Skip**.



4. Enter your serial number, then click **Activate**. This info will be sent to our activation server to complete the procedure.



5. If a success, you'll get a corresponding notification.



Offline Activation

1. If having problems with the Internet or specifically configured Firewall at login to your Paragon's (Facebook) account on the target computer, the wizard will offer you to try an offline option. Before you proceed, write down your GUID and the provided link somewhere.

We are unable to complete the online activation process. Please make sure you are connected to the internet and try again.

If this does not help, please use the offline activation procedure instead with three simple steps: Go to <https://my.paragon-software.com/activate>, create a license file to bind your serial number and device identifier (GUID), then import the created license file with the «Select License File» button below.

If you still have questions or issues with activating your software, please contact our Support Team from the «Submit Support Request» button inside the product.

Your GUID: **00000000-0000-1000-8000-000C2934FA85**

GUID (globally unique identifier) - is a unique reference number used as an identifier in computer software. Paragon license will be linked to your Mac's GUID.

Cancel Select License File...

2. Use the saved link on any computer with the Internet to visit the company's website to sign in to your Paragon's (Facebook) account.

MyParagon Customer Portal

Sign in

or [create an account](#)

jimbubblestone@gmail.com

.....

Forgot password?

Sign in

OR SIGN IN WITH

f Facebook

3. Enter your serial number and GUID in the corresponding fields, then click **Export license file**.

Offline activation

If you've arrived on this page, chances are you're having a problem activating your copy of a Paragon Software product online.

To resolve this issue, we offer an offline activation procedure, which takes just three simple steps:

1. Create a special license file, which binds the serial number of your product together with a unique identifier for your system (GUID). You can locate the GUID of your computer in the software's offline activation dialog.
2. Export the license file to your computer.
3. Import the license file from your system to the Paragon product installed on the device with the license-bound GUID.

For steps 1 and 2, please enter your serial number and device GUID in the form below to generate the license file. Next, click «Export license file».

03FU3B-P2LUDF-SO1HKM-T1L40E-52HA3T

00000000-0000-1000-8000-000C2934FA85

Export license file

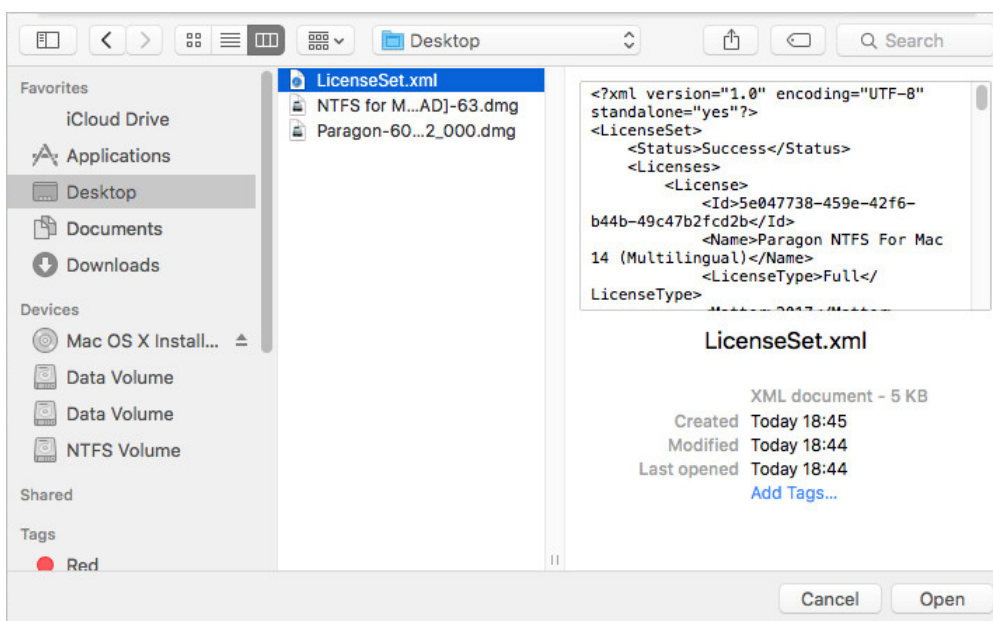
OR

Send email

When finished, you'll need to switch back to the Paragon Software product and import the created license file.

If you still have questions or issues activating your software, please contact our Support Team via [MyParagon > Support > New Support Request](#).

4. If the provided data is valid, you should get the "LicenseSet.xml" file. Copy it to the target computer, then use the **Select License File...** option for the import.

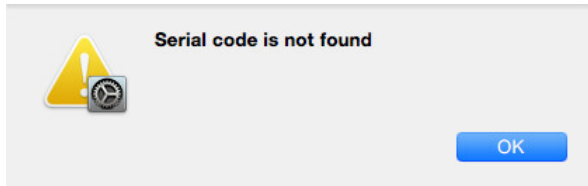


5. Next you are to provide a password of a user with the administrator privilege.

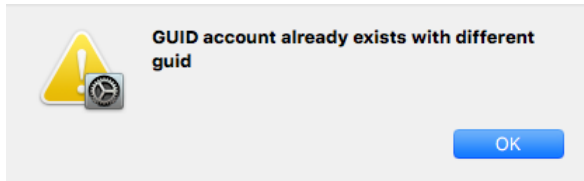
- If a success, you'll get a corresponding notification.

Other notification messages

- When providing an incorrect serial number.



- When trying to use a serial number already activated on another computer.



System Requirements

To use Paragon ExtFS for Mac OS X, you should install it first. But before that, make sure your computer meets the following minimum system requirements:

- Operating systems: Mac OS X 10.8 Mountain Lion, 10.9 Mavericks, 10.10 Yosemite, [10.11 El Capitan](#)

Installing the Driver

To install Paragon ExtFS for Mac OS X, please do the following:

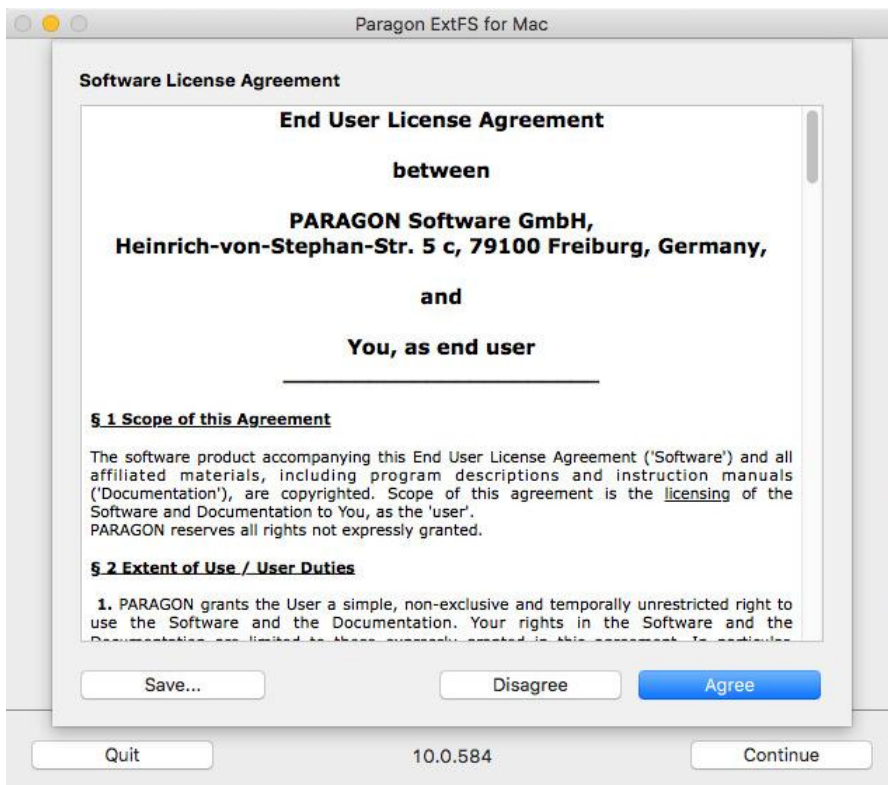
- Click on the supplied DMG disk image.
- After the installation package has been extracted you can choose whether to install/de-install the driver or read the product manual. Click **Install ExtFS for Mac® OS X** to initiate installation of the driver.



- Confirm opening the installation package.
- Click **Continue** on the Welcome page.



5. In order to continue the installation you are to accept all conditions stated in Paragon's license agreement by clicking the **Agree** button. You can also save the agreement by using the appropriate button.



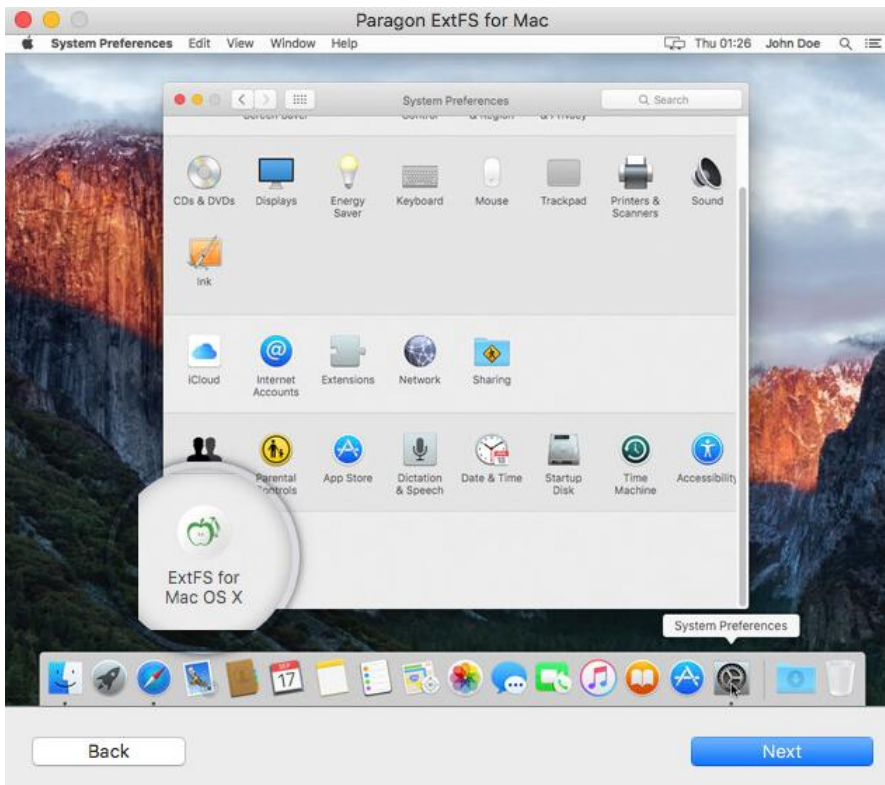
6. Next you are to provide a password of a user with the administrator privilege.



7. Monitor the installation progress.



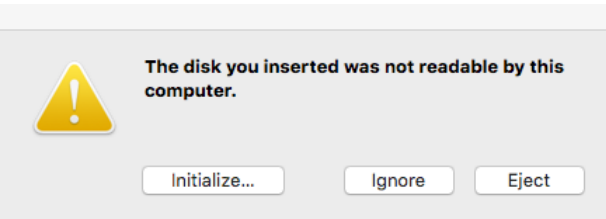
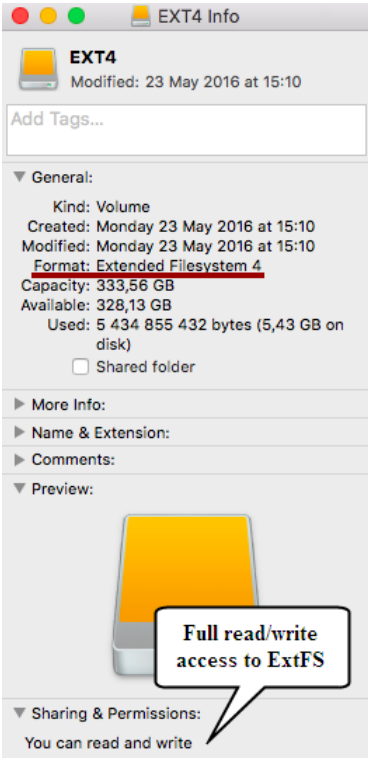
8. Finally the installation wizard will display a couple of screenshots that help to get started with the product. When ready, click **Restart** to complete the installation.





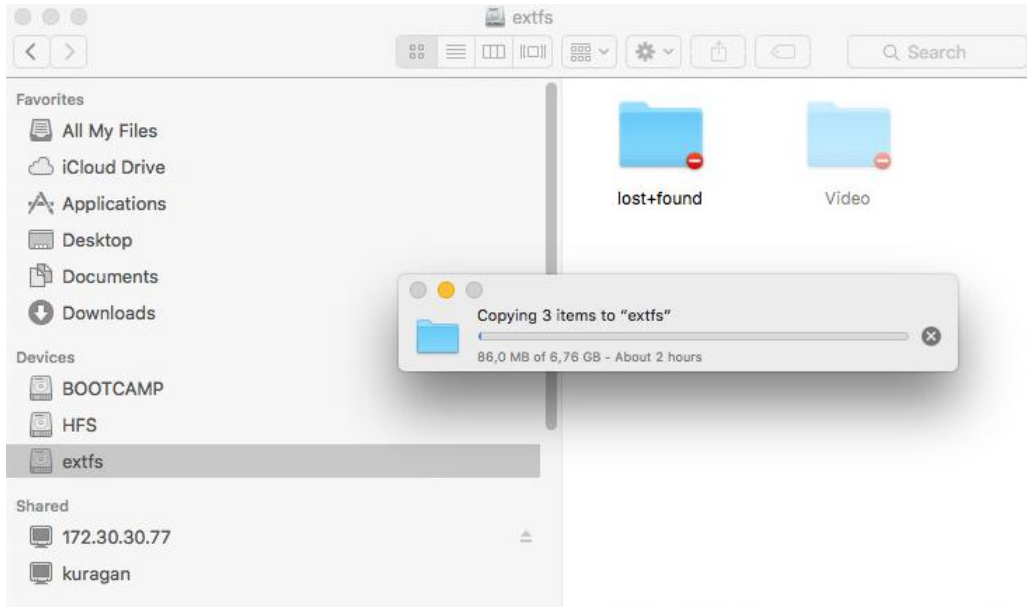
Using the Driver

Once the driver has been installed you obtain full read/write access to any type of ExtFS as if it's Mac OS X-native.

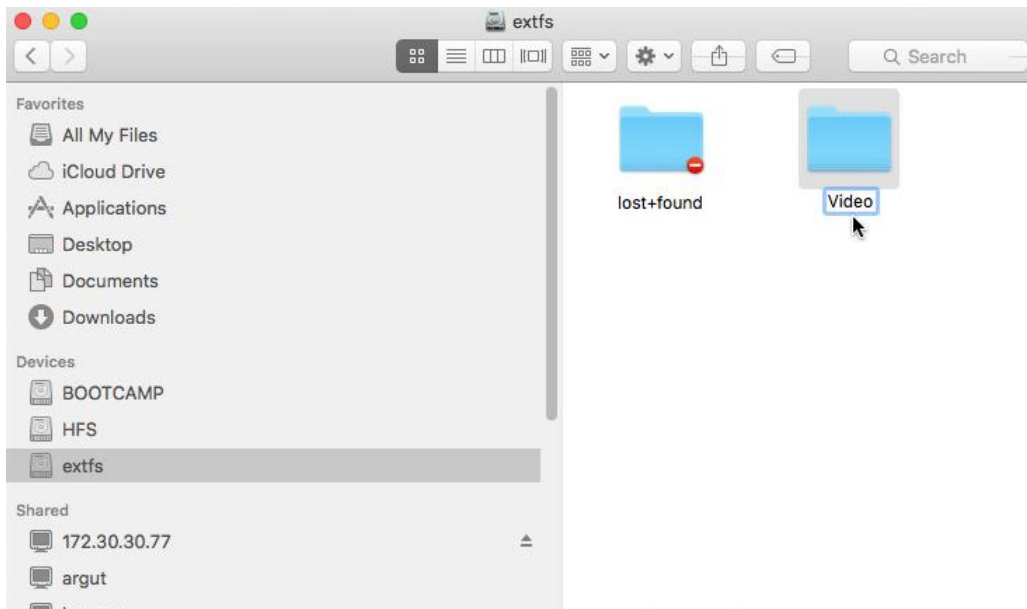
Before installing the Paragon driver	After installing the Paragon driver
	
<p>In case you connect any Ext2, Ext3 or Ext4 formatted disk you can see the message above.</p>	

You can now carry out any operation on an ExtFS volume, like:

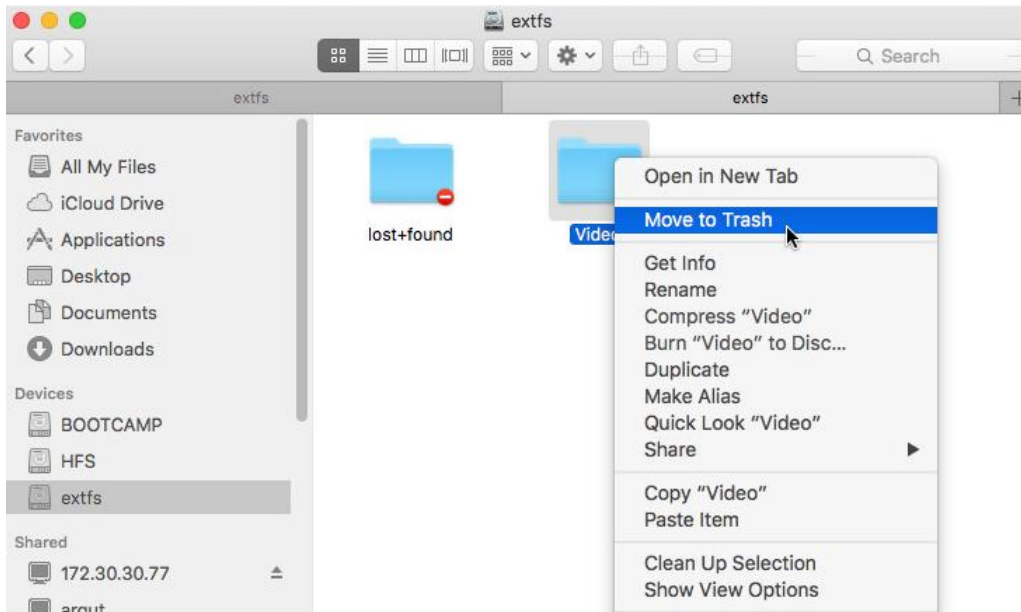
- Transfer data;



- Modify data;



- Delete data;



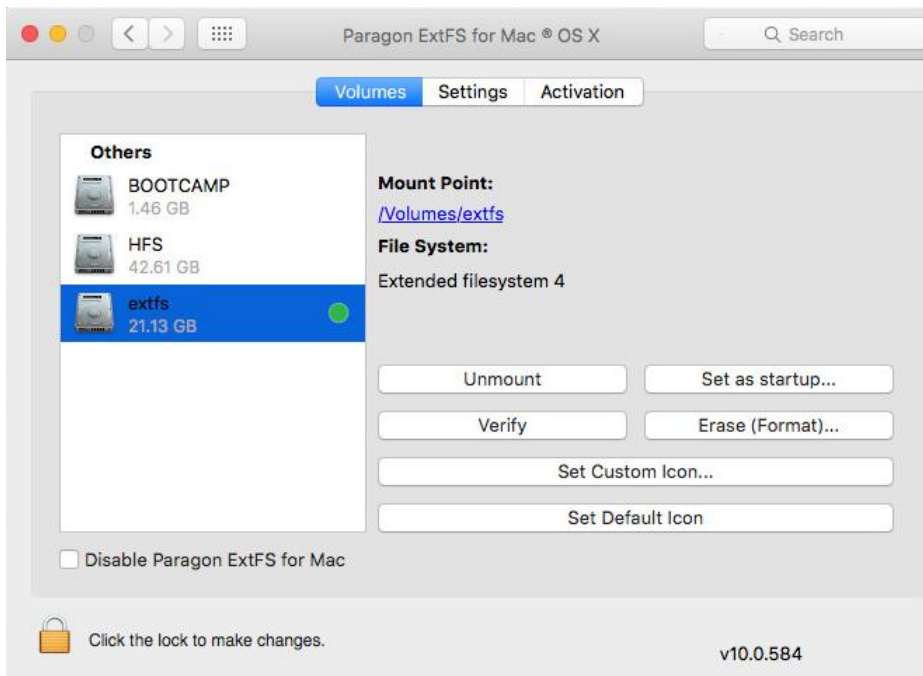
Just whatever you feel like doing.

Configuring the Driver

Paragon ExtFS for Mac OS X is very flexible and can be easily set up either with the help of a graphical interface or from the command line.

Driver Setup with Graphical Interface

1. Open the EXTFS Preferences Pane: **Applications > System Preferences > ExtFS for Mac**.
2. Click on the **Volumes** tab to see a list of available partitions on the left.



Setting ExtFS Volume as Startup Disk

Select an ExtFS partition on the left side of the pane, then click on the **Set as Startup...** button. In the opened dialog either choose to restart your Mac from the selected partition immediately or postpone this operation until the next time you switch on the computer.



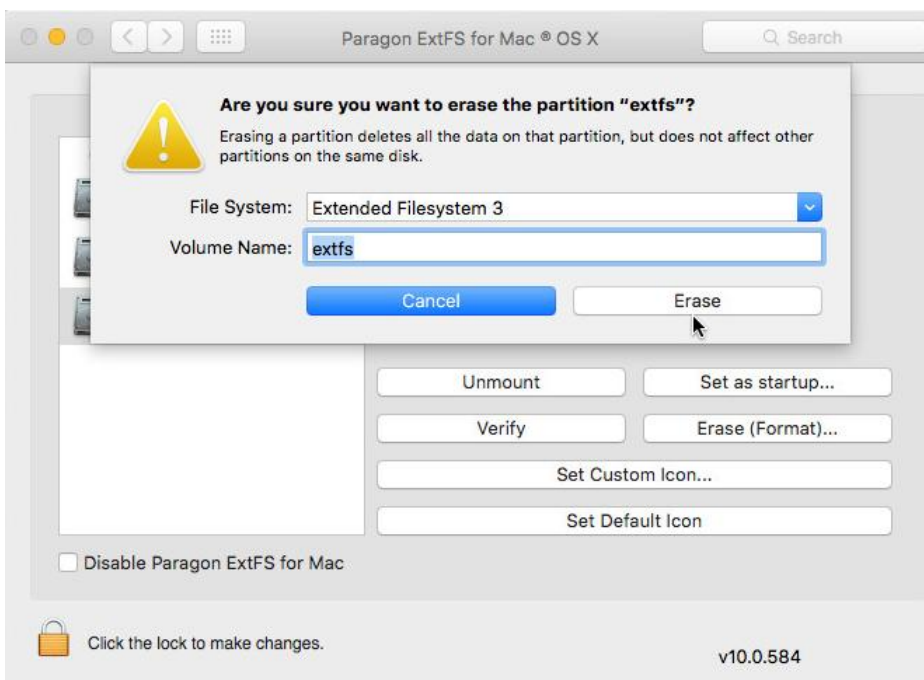
To make your Mac OS X an active operating system again please do the following:

- Press and hold the **Option** key during the system restart until the Startup Manager appears, then select the required bootable partition;
- Launch the Mac OS X Startup Disk utility to make your Mac OS X an active operating system or use the ExtFS Preferences Pane.

Formatting Volumes

You can format any unused partition (a partition that doesn't accommodate your Mac OS X) available in your system to ExtFS2/3/4 or format an existing ExtFS partition to HFS+, exFAT or any other file system supported by Mac OS X. If having Paragon NTFS for Mac installed in the system, the Windows-native NTFS file system becomes available to select as well.

Select a partition you'd like to format on the left side of the pane, then click on the **Erase (Format)...** button.



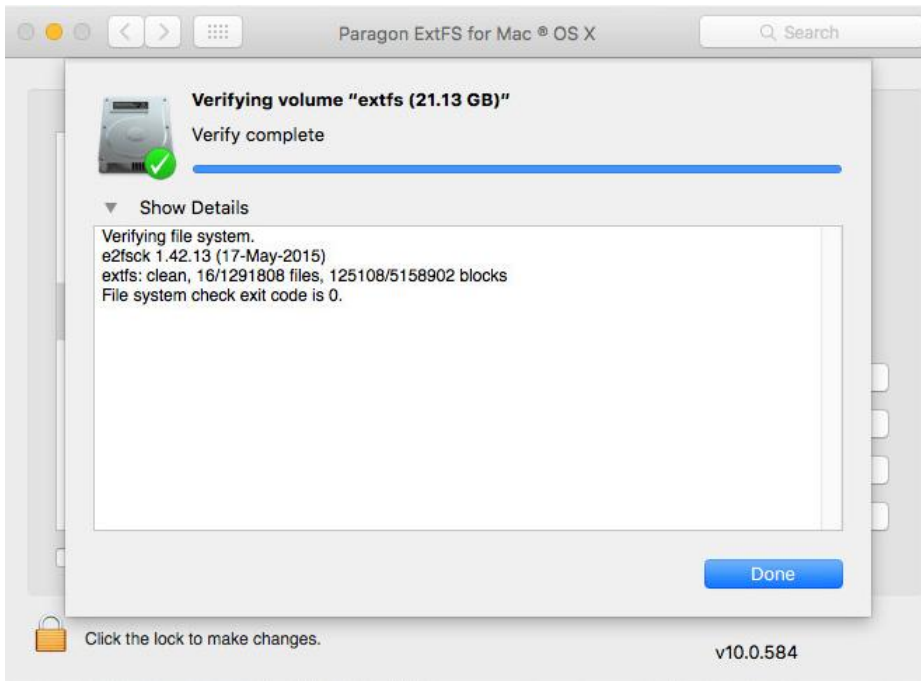
- Select the required file system type from the popup list;
- Type in a new volume label (irrelevant parameter used for notification purposes);
- Click on the **Erase** button to format the partition.



During installation of our driver, the setup wizard automatically adds the possibility to format partitions to ExtFS into Mac OS X Disk Utility. Click [here](#) for more information.

Verifying Volumes

You can check integrity and fix errors on any type of ExtFS. To do that, please select an EXTFS partition on the left, then click on the **Verify** button.



During installation of our driver, the setup wizard automatically adds the possibility to check and repair ExtFS partitions into Mac OS X Disk Utility. Click [here](#) for more information.

Mounting Volumes

You can mount or unmount any unused (Mac non-system) partition available in your system. To do that, please select a non-system partition on the left, then click on the **Mount/Unmount** button.

Setting Custom/Default Icon

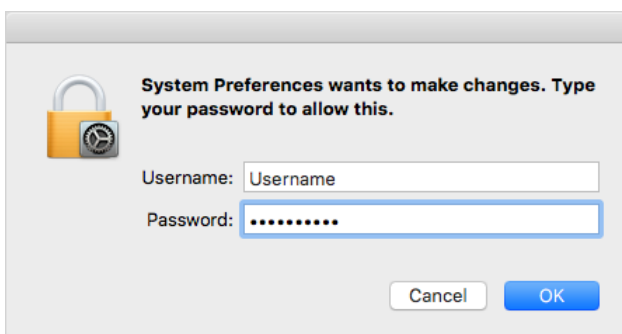
You can find and set your own icon for the selected EXTFS partition or get back to the default icon at any moment by using the corresponding buttons.

Deactivating the Driver

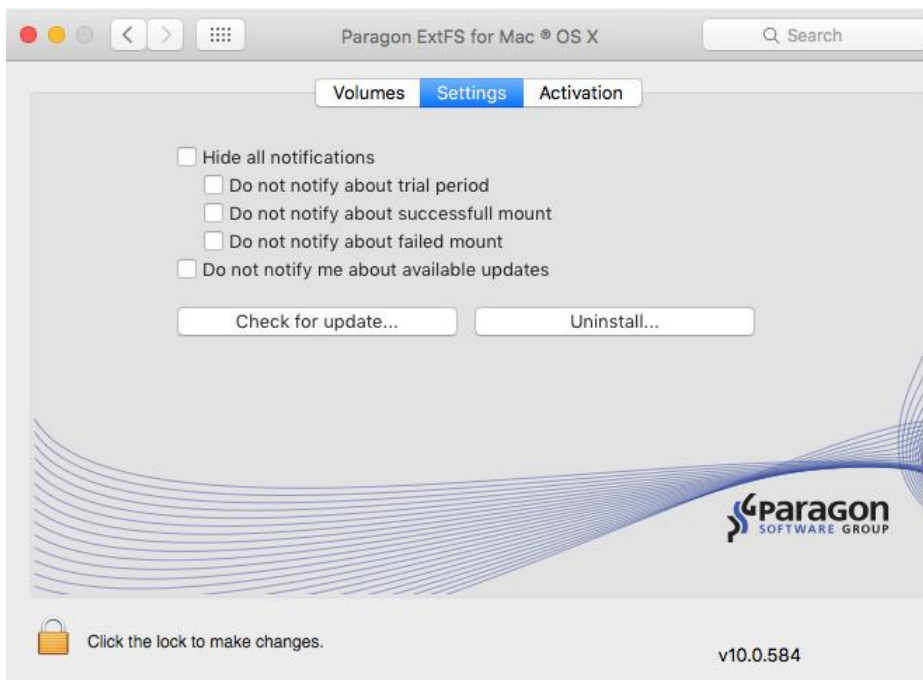
You can deactivate the driver by marking the appropriate checkbox at the bottom of the window.



Only users who can provide an administrator's password are allowed to modify preferences of the driver.



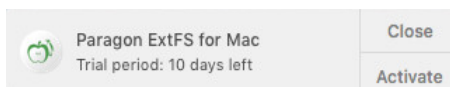
3. Click on the **Settings** tab to see a number of additional options.



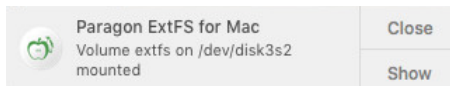
Configuring Notifications

By default, you will be notified through popup windows on the main product events. These include the current status with the trial period, availability of updates, disk mount reports. If necessary, you can disable all or any type of notifications.

Expiration of the trial period:



Successful mount:



Checking for Updates

By default, Paragon ExtFS for Mac automatically checks company's website for available updates once a day. You can force this checkup at any moment by clicking **Check for Updates...** For more details, please consult the [Updating the Driver](#) chapter.

Uninstalling the Driver

By clicking **Uninstall...** you can remove Paragon ExtFS for Mac from the system. For more details, please consult the [Deinstalling the Driver](#) chapter.

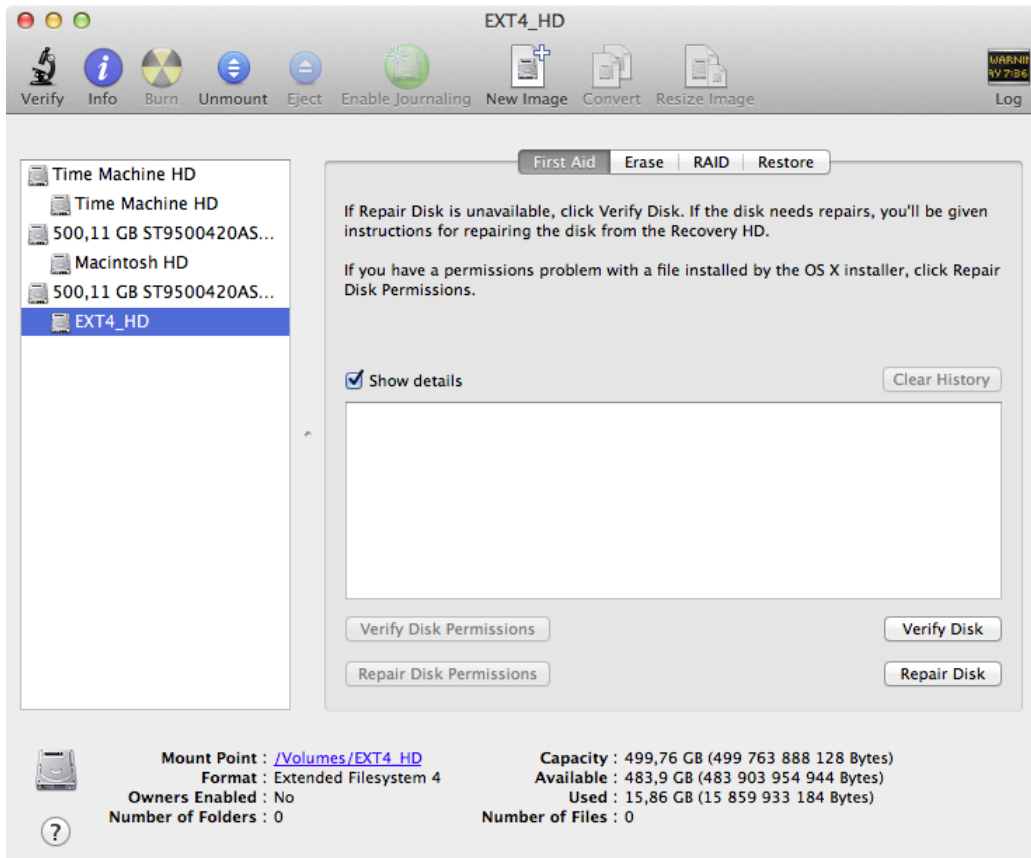
Extra Functionality



Apple doesn't allow the use of third-party drivers in the GUI version of Disk Utility of El Capitan. Please either use the [EXTFS Preferences Pane](#) (recommended) or command line tools described in this section to manage EXTFS partitions under El Capitan.

1. **Check/Repair ExtFS Volumes.** During installation of our driver, the setup wizard automatically adds the possibility to check integrity and fix errors on any type of ExtFS into Mac OS X Disk Utility. To do that, please follow the steps below:

- Launch Disk Utility: **Applications > Utilities > Disk Utility**;
- Select an ExtFS volume from the list of available partitions on the left;
- Click on the **First Aid** tab at the top of the window;
- Click on the **Verify Disk** button to check it for integrity or the **Repair Disk** button to fix errors (if any).



You can also carry out these operations from the command line:

- Launch the command line: **Applications > Utilities > Terminal**;
- Type in `/usr/local/sbin/fsck_ufs ExtFS` to get help.

```
Last login: Thu May 26 11:24:24 on ttys000
apples-Mac:~ apple$ /usr/local/sbin/fsck_ufs ExtFS
Usage: /usr/local/sbin/e2fsck [-panyrcdfv] [-b superblock] [-B blocksz]
      [-I inode_buffer_blocks] [-P process_inode_size]
      [-l|-L bad_blocks_file] [-C fd] [-j external_journal]
      [-E extended-options] device

Emergency help:
-p          Automatic repair (no questions)
-n          Make no changes to the filesystem
-y          Assume "yes" to all questions
-c          Check for bad blocks and add them to the badblock list
-f          Force checking even if filesystem is marked clean
-v          Be verbose
-b superblock  Use alternative superblock
-B blocksz    Force blocksz when looking for superblock
-j external_journal  Set location of the external journal
-l bad_blocks_file  Add to badblocks list
-L bad_blocks_file  Set badblocks list
apples-Mac:~ apple$
```

Use `/usr/local/sbin/fsck_ufs ExtFS -c device` to check disk integrity;

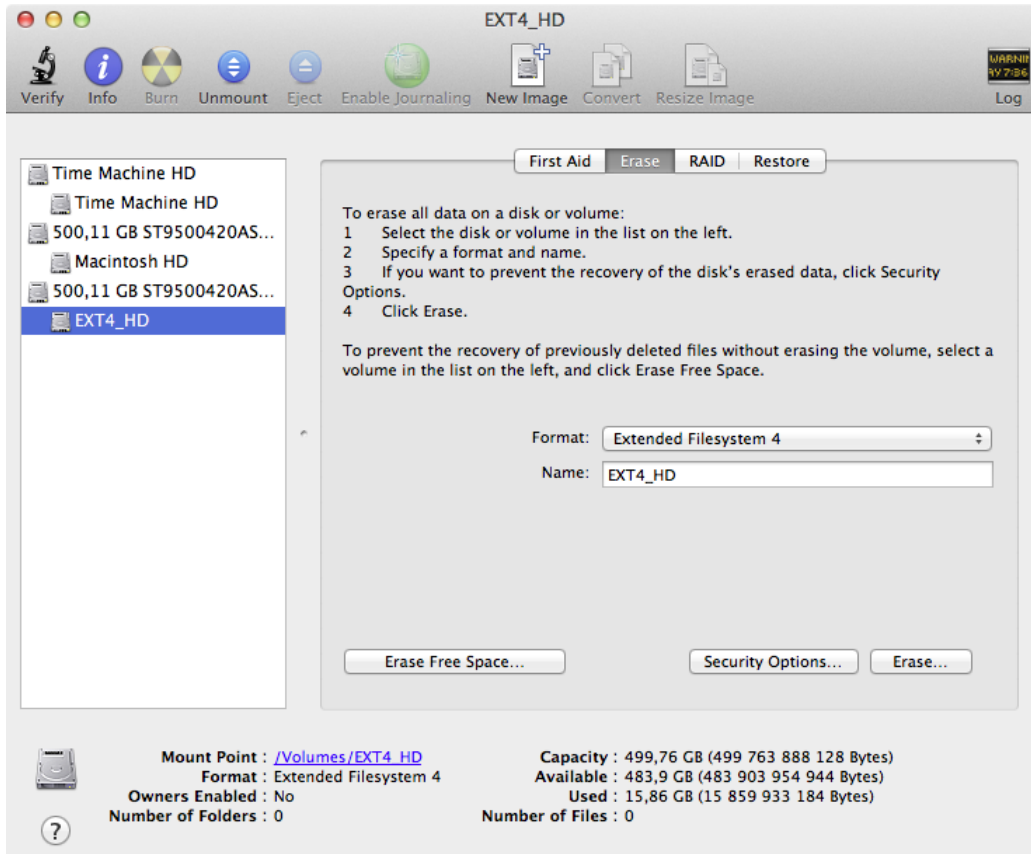
Use `/usr/local/sbin/fsck_ufs ExtFS -p device` to fix disk errors



The `fsck_ufs ExtFS` utility has been moved from `/sbin/` to `/usr/local/sbin/`. The new location is not default, thus you need to provide a full path to it.

2. **Format ExtFS Volumes.** During installation of our driver, the setup wizard automatically adds the possibility to format ExtFS volumes into Mac OS X Disk Utility. To do that, please follow the steps below:

- Launch Disk Utility: **Applications > Utilities > Disk Utility;**
- Select a partition you need to format to ExtFS from the list of available partitions on the left;
- Click on the **Erase** tab at the top of the window;
- Select **Extended Filesystem 2/3/4** from the popup list;
- Type in a new volume label (irrelevant parameter used for notification purposes);
- Click on the **Erase** button to format the partition.



You can also carry out this operation from the command line:

- Launch the command line: **Applications > Utilities > Terminal;**
- Type in **diskutil** to get help.

```

apples-Mac:~ apple$ diskutil
Disk Utility Tool
Utility to manage local disks and volumes
Most options require root access to the device

Usage: diskutil [quiet] <verb> <options>, where <verb> is as follows:

  list                (List the partitions of a disk)
  info[rmation]      (Get information on a specific disk or partition)
  listFilesystems    (List file systems available for formatting)
  activity           (Continuous log of system-wide disk arbitration)

  u[n]mount          (Unmount a single volume)
  unmountDisk        (Unmount an entire disk (all volumes))
  eject              (Eject a disk)
  mount              (Mount a single volume)
  mountDisk          (Mount an entire disk (all mountable volumes))

  enableJournal      (Enable HFS+ journaling on a mounted HFS+ volume)
  disableJournal     (Disable HFS+ journaling on a mounted HFS+ volume)
  moveJournal        (Move the HFS+ journal onto another volume)
  enableOwnership    (Treat as exact User/Group IDs for a mounted volume)
  disableOwnership   (Ignore on-disk User/Group IDs for a mounted volume)

  rename[Volume]     (Rename a volume)

  verifyVolume       (Verify the file system data structures of a volume)
  repairVolume       (Repair the file system data structures of a volume)

  verifyDisk         (Verify the components of a partition map of a disk)
  repairDisk         (Repair the components of a partition map of a disk)

  eraseDisk           (Erase an existing disk, removing all volumes)
  eraseVolume         (Erase an existing volume)
  reformat           (Erase an existing volume with same name and type)
  eraseOptical        (Erase optical media (CD/RW, DVD/RW, etc.))
  zeroDisk           (Erase a disk, writing zeros to the media)
  randomDisk         (Erase a disk, writing random data to the media)
  secureErase        (Securely erase a disk or freespace on a volume)

  partitionDisk      ((re)Partition a disk, removing all volumes)

```

Use **diskutil eraseVolume UFS2_EXTFS "Disk Label" device** to format the required partition to Ext2;

Use **diskutil eraseVolume UFS3_EXTFS3 "Disk Label" device** to format the required partition to Ext3;

Use **diskutil eraseVolume UFS4_EXTFS4 "Disk Label" device** to format the required partition to Ext4.



There is no need to use inverted commas if label of your ExtFS disk contains just one word.

Another way to format a volume to ExtFS from the command line is to use a Paragon's utility:

- Launch the command line: **Applications > Utilities > Terminal**;
- Type in **newfs_ufs EXTFS** to get help.

```

Last login: Thu May 26 11:42:09 on ttys000
apples-Mac:~ apple$ /usr/local/sbin/newfs_ufs EXTFS
Usage: mke2fs [-c|-l filename] [-b block-size] [-C cluster-size]
        [-i bytes-per-inode] [-I inode-size] [-J journal-options]
        [-G flex-group-size] [-N number-of-inodes]
        [-m reserved-blocks-percentage] [-o creator-os]
        [-g blocks-per-group] [-L volume-label] [-M last-mounted-directory]
        [-O feature[,...]] [-r fs-revision] [-E extended-option[,...]]
        [-t fs-type] [-T usage-type ] [-U UUID] [-jnvDFKSV] device [blocks-count]
apples-Mac:~ apple$ █

```

Typical Application Cases

You might face various situations where Paragon ExtFS for Mac OS X will be the most preferable way out. Let's just consider a little closer two of them.

1. You've got at the disposal a dual-boot system of Mac OS X and Linux and it will be really convenient to get a full-fledged access (read/write) to Windows ExtFS partitions under Mac OS X. To tackle the issue, please follow the steps below:
 - Start up your Mac OS X;
 - [Install Paragon ExtFS for Mac OS X](#);
 - Reboot your computer into Mac OS X once again;
 - [Enjoy ExtFS under Mac OS X](#).
2. You need to transfer data (files over 4GB in size) from your Mac PC to a Linux-based computer using an external hard drive. FAT32 file system that is supported by both systems cannot be used as it doesn't support files over 4GB. To tackle the issue, please follow the steps below:
 - Start up your Mac OS X;
 - [Install Paragon ExtFS for Mac OS X](#);
 - Reboot your computer into Mac OS X once again;
 - Connect an external drive to Mac PC and format it to ExtFS;
 - Copy files you need from your Mac PC to the external drive;
 - Connect the external drive to a Linux PC;
 - Copy files from the external drive to the Linux PC.
3. You need to read or modify files stored on an external or internal (local) hard drive with Linux extended file system from your Mac PC. To tackle the issue, please follow the steps below:
 - Start up your Mac OS X;
 - [Install Paragon ExtFS for Mac OS X](#);
 - Connect an external drive with Ext2, Ext3 or Ext4 FS partitions to Mac PC (if any);
 - Reboot your computer into Mac OS X once again;
 - Read or modify files stored on the hard disk from your Mac PC.
4. You need to extend the set of used file systems to store your data on the most popular file systems of the most popular operating systems and don't worry where to save your data:
 - Start up your Mac OS X;
 - [Install Paragon ExtFS for Mac OS X](#);
 - Reboot your computer into Mac OS X once again;
 - [Enjoy ExtFS under Mac OS X](#).
5. As a professional using Apple to produce video you need to use the cheapest methods to distribute Digital Cinema Package (DCP) materials. Just install the driver that enables the ability to read from and write to (and

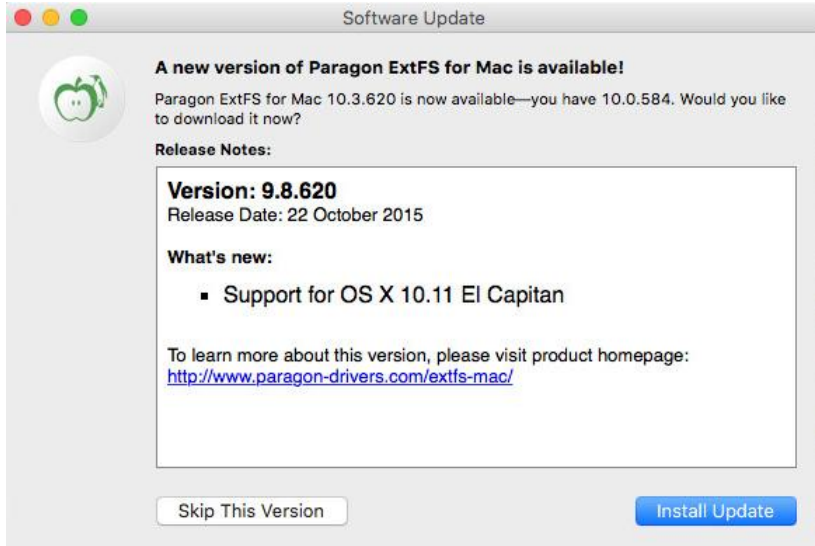
even format) Ext formatted drive. ExtFS is the file system format used on USB 2.0 DCP distribution hard drives preferred by the Digital Cinema distribution facilities:

- Start up your Mac OS X;
- [Install Paragon ExtFS for Mac OS X](#);
- Connect an external drive with Ext2, Ext3 or Ext4 FS partitions to Mac PC;
- Reboot you computer into Mac OS X once again;
- Write to or read DCP materials stored on the hard disk from your Mac PC.

Updating the Driver

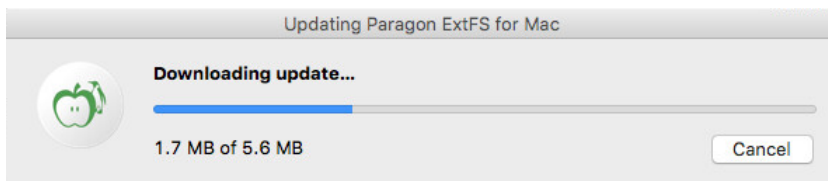
By default, Paragon ExtFS for Mac OS X automatically checks company's website for available updates once a day. You can force this checkup at any moment by using the **Check for Updates...** option of the [ExtFS Preferences Pane](#).

If a new version of the driver has been found, you will be prompted to install it.

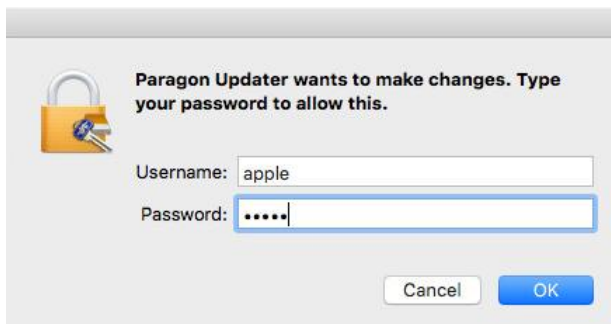


There are several actions you should do to update the driver:

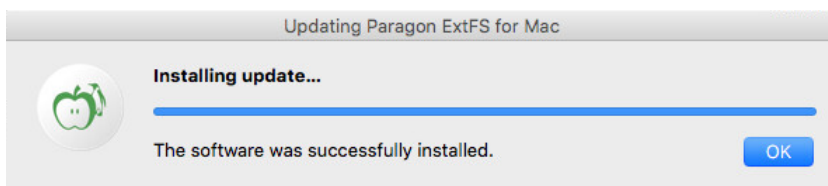
1. Click **Install Update** to initiate the update process.



2. Next you are to provide a password of a user with the administrator privilege.



3. Once the update process is over, click **OK**.

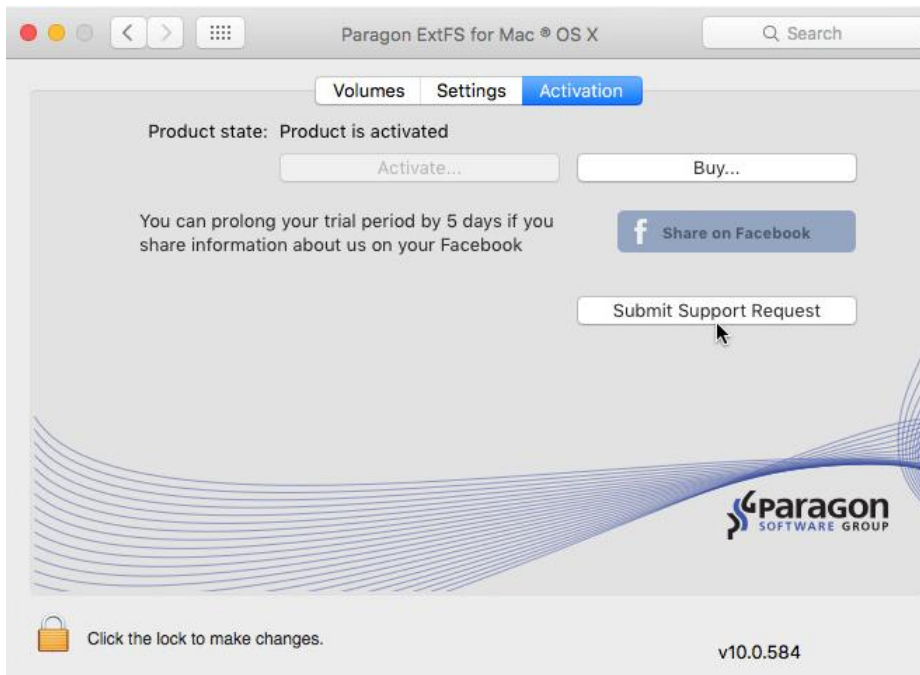


If you don't want our product to automatically check for updates, please mark the corresponding option in the [ExtFS Preferences Pane](#).

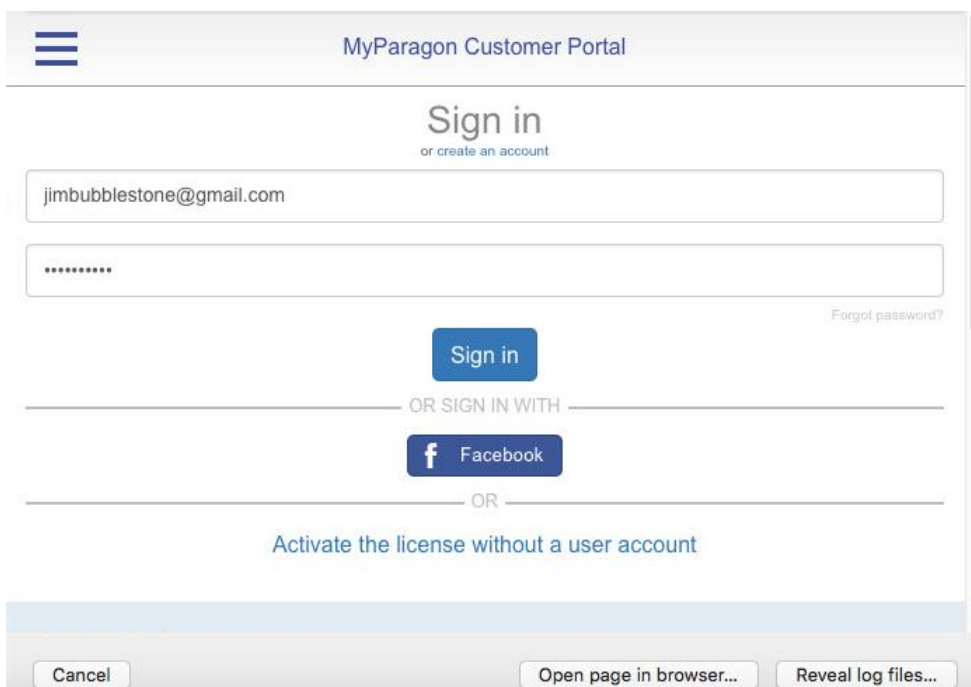
Submitting Support Request

In case of having difficulties with handling the product you can address our support engineers for assistance. If you're a registered user, you can do it directly from the ExtFS Preferences Pane. To help you solve your problem with minimal time, our engineers need operation logs and your brief description. All that can be prepared with a handy dialog.

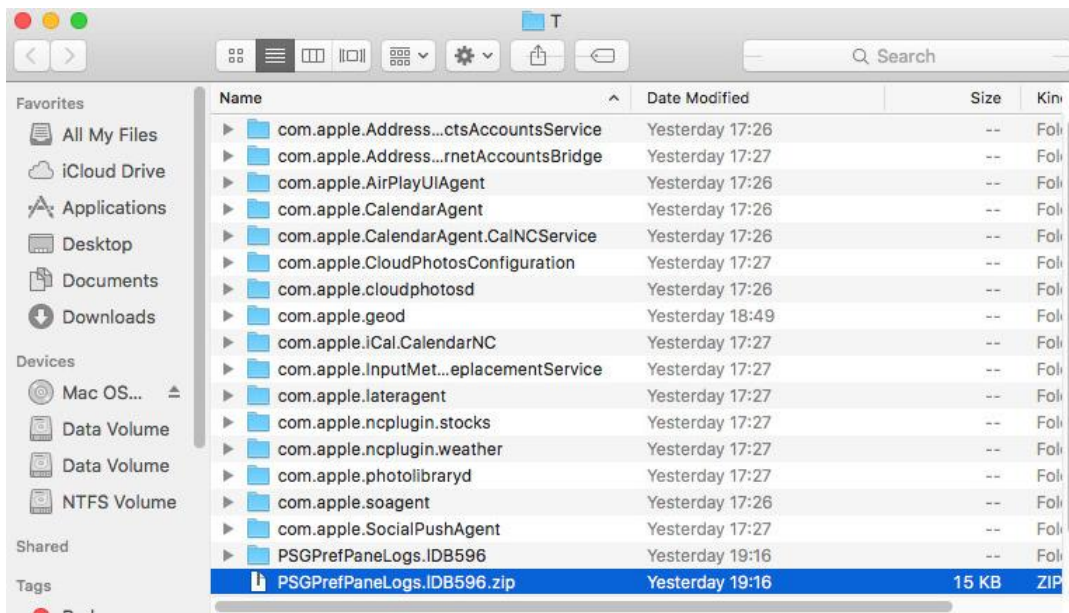
1. Open the ExtFS Preferences Pane: **Applications > System Preferences > ExtFS for Mac**.
2. Click on the **Activation** tab, then select **Submit Support Request**.



3. In the opened WebView browser enter an email and password of your Paragon's account, then click **Sign in**. Alternatively, you can sign in with your Facebook account.



Click **Reveal log files...** to check the prepared package doesn't contain anything confidential, but layouts of your disks, performed operations, etc.



Click **Open page in browser...** if you'd like to issue the support ticket in a friendly environment of your default OS X browser.

4. Fill out the ticket request form, then click **Post request**. That's all. Our support engineers will get in touch with you in a little while.

MyParagon

Knowledge Base Documentation

New Support Request

Ask a question, report a problem or give feedback by creating a request. Please fill in all the required fields for better support.

*** Subject**

Software problem

*** Product**

Other products

If your purchased product is not shown in the list, please register it via the "Register New Product" section.

*** Brief description**

*** Details of the request**

Cancel Open page in browser... Reveal log files...

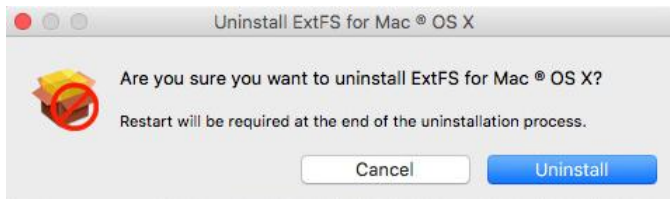
De-installing the Driver

To de-install Paragon ExtFS for Mac OS X, please do the following:

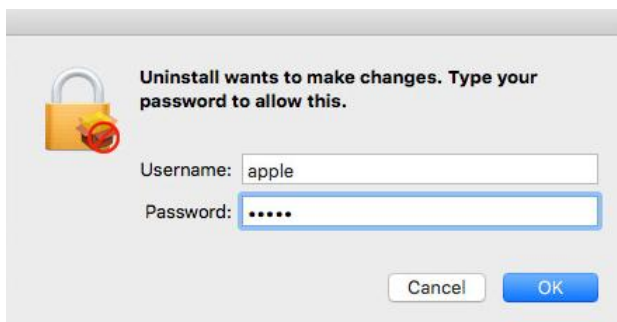
1. Open the installation package by clicking on the supplied DMG disk image.
2. After the installation package has been extracted click **Uninstall Paragon ExtFS for Mac® OS X** to initiate the de-installation process.



3. The setup wizard will ask confirmation before removing the driver from the system, so please click the **Uninstall** button.



4. Next you are to provide a password of a user with the administrator privilege.



5. Click **OK** to finish the de-installation process.



You can also de-install the product through the [ExtFS Preferences Pane](#).

Known Issues

The GUI version of Disk Utility in Mac OS X 10.11 El Capitan doesn't display mounted ExtFS partitions. It's due to the fact that Apple doesn't allow the use of third-party drivers in the GUI version of Disk Utility. Please use command line tools to manage ExtFS partitions:

- To format or create a new disk:
 - **sudo diskutil eraseVolume "UFSD_EXTFS" "LABEL" /dev/diskID** – creates an Ext2 partition,
 - **sudo diskutil eraseVolume "UFSD_EXTFS3" "LABEL" /dev/diskID** – creates an Ext3 partition,
 - **sudo diskutil eraseVolume "UFSD_EXTFS4" "LABEL" /dev/diskID** – creates an Ext4 partition,
- To repair a disk: **sudo diskutil verifyVolume /dev/diskID**;
- To mount a disk manually: **diskutil mount /dev/diskID** or
sudo mkdir /Volumes/mountPoint/ – creates a folder to mount a disk to,
/usr/local/sbin/mount_ufsd_ExtFS /dev/diskID /Volumes/mountPoint – mounts a disk to the earlier created folder.



All found ExtFS partitions are automatically mounted by default.

Contacting Paragon Software GmbH

If you have any questions about the company products, please do not hesitate to contact Paragon Software GmbH.

Service	Contact
Visit Paragon GmbH web site	www.paragon-software.com
Registration & updates web-service	www.paragon-software.com/support
Knowledge Base & Technical Support	kb.paragon-software.com
Pre-sale information	sales@paragon.software.com



Unfortunately, the company can only provide technical support in the following languages at the present time: English, German, French and Russian. We are really sorry for possible inconvenience.

Glossary

Hard Link is a reference, or pointer, to physical data on a storage volume. On most file systems, all named files are hard links. The name associated with the file is simply a label that refers the operating system to the actual data. As such, more than one name can be associated with the same data. Though called by different names, any changes made will affect the actual data, regardless of how the file is called at a later time. Hard links can only refer to data that exists on the same file system.

HFS Plus File System (HFS or Mac OS Extended) is an updated version of HFS (Hierarchical File System) and is applied nowadays as the primary file system for Macintosh computers. Unlike HFS it supports much larger files (block addresses are 32-bit length instead of 16-bit) and uses Unicode (instead of Mac OS Roman) for naming the items (files, folders). Besides it permits filenames up to 255 UTF-16 characters in length, and n-forked files, though almost no software takes advantage of forks other than the data fork and resource fork. One of the crucial improvements of this file system is of course the possibility to use a full 32-bit allocation mapping table that resulted in much less wasted space (and more files).

Ext2 File System is a file system for the Linux OS. It was initially designed as a replacement for the extended file system (ext). Although ext2 is not a journaling file system, its successors, Ext3/Ext4 FS, provide journaling and is almost completely compatible with ext2.

Resource Fork is a construct of the Mac OS operating system used to store structured data in a file, alongside unstructured data stored within the data fork. A resource fork stores information in a specific form, such as icons, the shapes of windows, definitions of menus and their contents, and application code (machine code).

Symbolic Link (Symlink or Soft Link) consists of a special type of file that serves as a reference to another file or directory. Unlike a hard link, which points directly to data and represents another name for the same file, a symbolic link contains a path which identifies the target of the symbolic link. Thus, when the user removes a symbolic link, the file to which it pointed remains unaffected. Symbolic links may refer to files even on other mounted file systems.

UFSD™ (Universal File System Driver) technology developed by Paragon Software provides full read/write access to the so-called popular file systems (NTFS, FAT16/32, Ext2/Ex3FS, etc.) under operating systems that cannot do it by default (e.g. NTFS for Linux, Ext2/Ex3FS for Windows, etc.).

This technology is based on the direct access to physical drives and buffered Input/Output access, that is why it makes it possible to process unsupported partitions (browse contents, read and modify files, copy and create new files and folders, etc.) while keeping an acceptable level of performance.