HDCheck.COM

Hard Disk Check Service

User Manual for Windows XP®

Version 1.1

February 15, 2011

Table of Contents

1. About S.M.A.R.T.

Since Disk Drives (DD) were introduced by IBM in 1956, they became the ultimate choice as secondary storage for the Information Technology (IT) industry. Initially, disk drives used removable disk packets. Soon after they became predominant on the secondary storage market, it became clear that there is a problem with their reliability. The logical solution was to backup data on tape drives. This technology is still in use today.

Backing up disk drives is not the ultimate solution of the problem with data storage and disk reliability. Tape drives also have drawbacks. They are expensive, slow and bulky and are not absolutely reliable. Obviously, the IT industry needed a better solution.

Personal computers (PC) set up new requirements for secondary storage and the disk drive industry responded with a new approach. Based on the IBM's "Winchester" technology approach, Seagate Technology introduced the first 5 ¼ " completely sealed disk drive. This design received the popular name Hard Disk Drive (HDD). Over the years, the cost of disk drive storage dropped significantly to less than $1 per gigabyte (GB). In addition to that, storage capacity and device reliability rose significantly.

Having such capable, reliable and cheap HDD lead to the development of new technologies, like RAID, for increased data storage reliability. RAID stands for Redundant Array of Independent Disks and as the name implies, the reliability is acheeved due to storage redundancy. This technology became a part of all server installations and it has significantly reduced the need for tape backup.

But the main question remains in place: what to do when the hard drive fails or more importantly, **before** that happens.

The ultimate solution to protect the data stored on HDD is to make a backup of the data. Fortunately, today we have many efficient and easy to use technologies and there is no excuse not to do so. However, a backup is not enough because if your hard drive fails, the computer is useless.

The fact that HDD is so important for computer functionality was mentioned many years ago, but it became a serious problem when computers started being used to handle large amount of data stored in databases. To address this problem, in 1992 IBM originally developed and introduced a diagnostic method for their mainframe drives to give advanced warning of drive failures. This approach became popular among other HDD manufactures and later a proposal supported from major vendors was submitted to the ***Small Form Committee*** for standardization. The result was a jointly developed and widely supported standard S.M.A.R.T.

S.M.A.R.T. stands for **S**elf-**M**onitoring **A**nalysis and **R**eporting **T**echnology. It monitors hard drive performance and warns of impending disaster. Nearly all drives released since 2000 are S.M.A.R.T.-compliant.

Initially, S.M.A.R.T. capable hard disks had up to 30 attributes that held information for different measures related to the hard drive's performance and reliability. This is a very technical matter and is not standardized between different vendors. If you want to learn more about these attributes, refer to the manufacturer.

S.M.A.R.T. evolved significantly since the first specifications were published. At some point, part of the S.M.A.R.T. specifications were merged with ATA standards and the requirement that hard drives had to maintain those attributes was dropped. Instead, a series of self-tests, error logs, etc. were implemented.

Overall, S.M.A.R.T. can provide plenty of information for the hard drive's health assessment, but unfortunately interpreting that information is far beyond the abilities of the average computer user.

Keep in mind that most hard drives, even if they are S.M.A.R.T. enabled, do not have S.M.A.R.T. **turned on**. Turn on S.M.A.R.T. and begin tracking your drive attributes and perform the available self-tests. S.M.A.R.T. is only useful when you track these attributes over a period of time and check for self-test results on a regular basis.

2. About Hard Disk Check Service

You probably thought that the previous background about S.M.A.R.T. is a very technically oriented matter. For the computer users who are not hardware proficient or do not have enough time to conduct all tasks associated with the technology implementation, it may seem that S.M.A.R.T. is useless. We have challenged such opinions and created Hard Disk Check Service (HDCS) as an affordable, low cost service for those who want to be informed about potential problems with their hard drives in their computer configuration.

2.1 How the Hard Disk Check Service Works

The service is based on two steps: Gathering the S.M.A.R.T. data from the hard drive and sending it to **HDCheck.com** server for processing. As a result, the user will receive an e-mail with a report of the hard drive's health. The process can be fully automated and will occur without any work on the user's part.

The first step of the Hard Disk Check Service utilizes the excellent program **smartctl** created by Dr. Bruce Allen. The process is **absolutely transparent** because it is based on open source components.

2.2 The Cost of the Hard Disk Check Service

The main idea is that this service must be affordable and very low cost. It will cost you less than a dollar per month per drive, and you may use the service as often as you'd like.

If you are not too technically oriented, you may need some help from a friend or your PC technician. Another option is to refer to our list of certified independent contractors. Some of them may be able to install the service remotely. Of course, **the cost of this help is fully negotiable between you and the help provider**.

To make sure that your hard drive is supported by our service and that you are completely satisfied with the result, **we offer a one month evaluation period for free**. If our service doesn't work for you, you don't have to do anything else. We will disable your account automatically and delete all associated data with it.

2.3 How to Get Started

There are two approaches to setting up the service.

- The first option is the “quick and easy” setup. Most users have one computer and most computers have one hard drive. The “default” setup is fully automated and will install HDCS on everybody’s computer in under ten minutes.
- The second approach, called “Advanced Setup”, will give you the maximum power and benefits of the service. You can handle many computers with up to four hard drives installed, separated in different locations and having specific test schedules.

Detailed step-by-step instructions are included in the next topic.

2.4 How Much This Service Is Worth

It is a reasonable question. And the answer is easy: it can save you time and money.

Replacing a hard drive is not cheap or easy. The average cost of a HDD is between $50-100 and the replacement charges can double this number. Things can go troublesome with an additional fee to recover any data from the old hard drive. In addition, you will not be able to use your computer for a few days, and according to Murphy’s Law, it will happen when you need it the most.

According to HDD statistics, up to 1% of drives may fail during a year. HDCS cannot change that, but it can help you to face that challenge in a prepared and organized manner. On average, in the 60 days following the first scan error on a drive, the drive is 39 times more likely to fail than it would have been had no such error occurred. Of course, your hard drive can fail at any time without any warning, but we think that it is worth it to spend less than a dollar per month to get the potential warning. It’s like the “Service engine soon” light in your car: it cannot prevent your car from failing, but it can give you enough time to take the proper action.

3. Setup the Hard Disk Check Service

The four basic steps for setting up the Hard Disk Check Service were briefly discussed in the previous topic. Before you start the real setup process, some requirements have to be met:

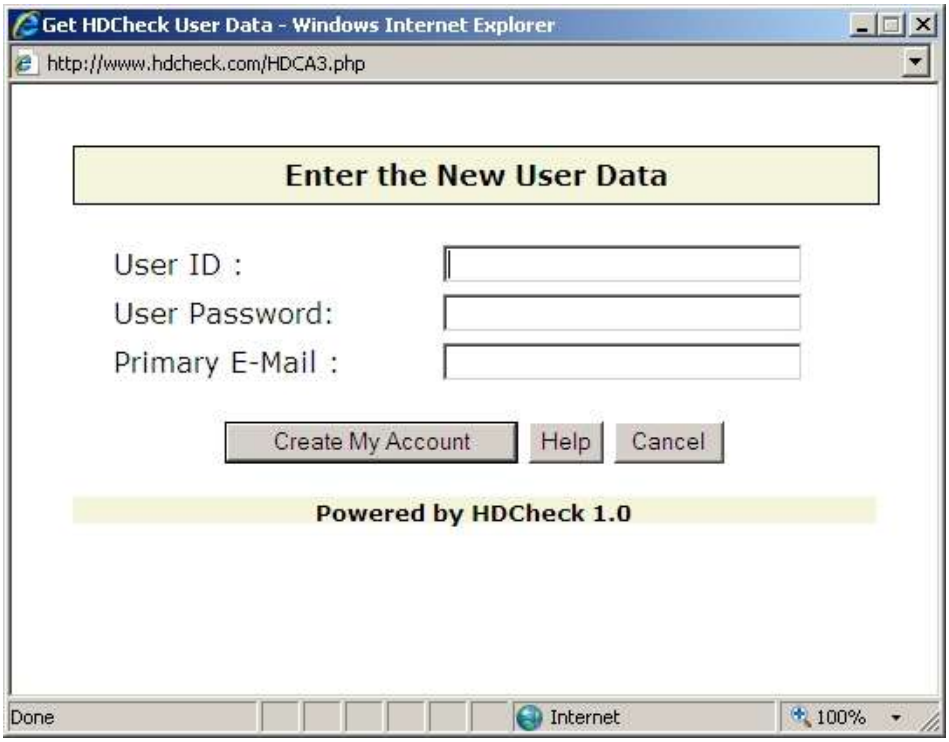
- You have to have a **valid e-mail address** where the reports will be sent.
- You have to have **administrator privileges** on the computer.
- The computer that will be monitored must have a **non-dialup internet connection** (such as DSL, cable, wireless, LAN, etc.) If there is no such connection, the Checking Schedule will not work.

If these requirements are met, let us go into more details on how to get the job done. Whether you choose the easy or advanced setup, you have to create a user account with HDCheck.com first. It is easy and anonymous because we do not collect or use any personal data.

3.1 Create a User Account with HDCheck.com.

If you have downloaded this Manual from **HDCheck.com,** you know how to go there. The gateway to the service related tasks is in the page under the **My Account** tab. You will see two buttons on the right.

Click on **Create an Account** button and a new window will be opened.

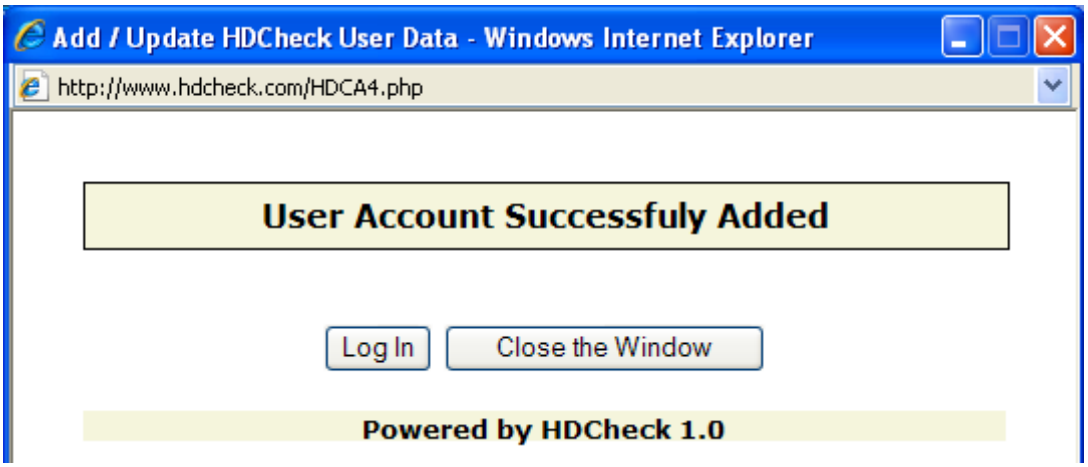


Enter a User ID (1 to 20 characters) and password (5 to 10 characters). You can use capital and small letters, numbers, and the special characters dot ".", underscore "_", minus sign "-" and space. **Including other characters will make your User ID invalid.**

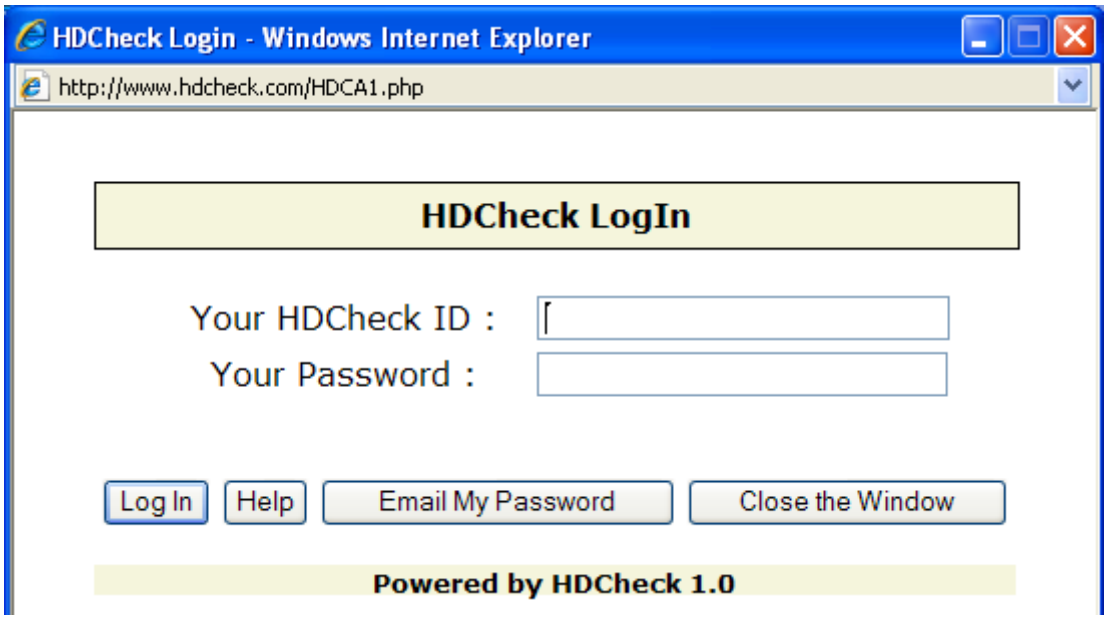
Enter an e-mail address (up to 60 characters) where you will receive all reports associated with your account. The input is formally checked and some exotic e-mail addresses may be rejected.

This service works with two e-mail addresses: **primary** and **secondary**. Using both makes sense for advanced users or those that we will call "Technicians" who will maintain this service in behalf of their customers.

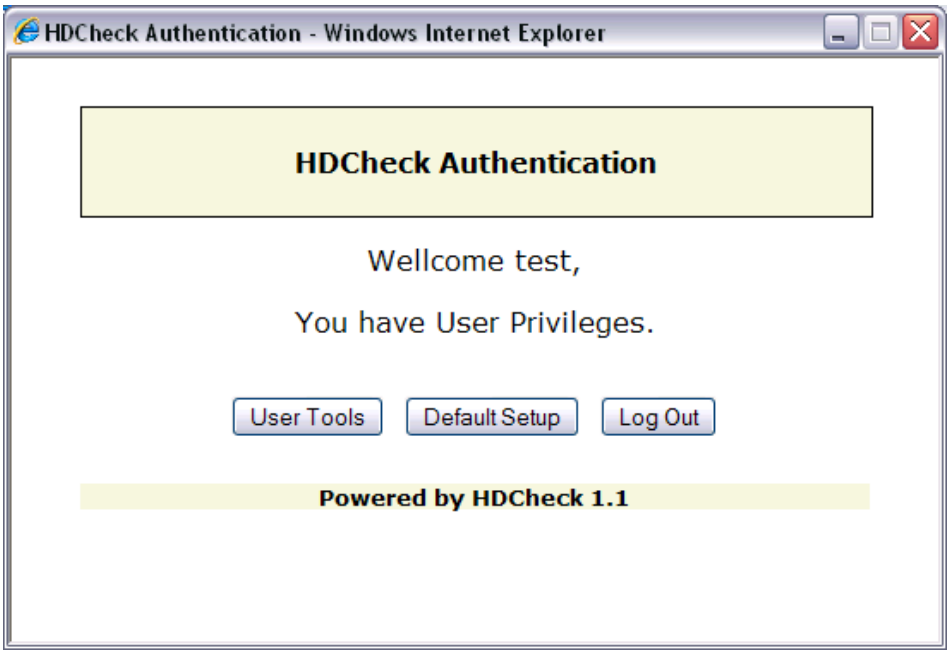
You'll need to have your User ID and Password to login in the future, so make sure to write it down and keep it somewhere safe. When you are ready, click on the **Create My Account** button. You will get a confirmation like this:



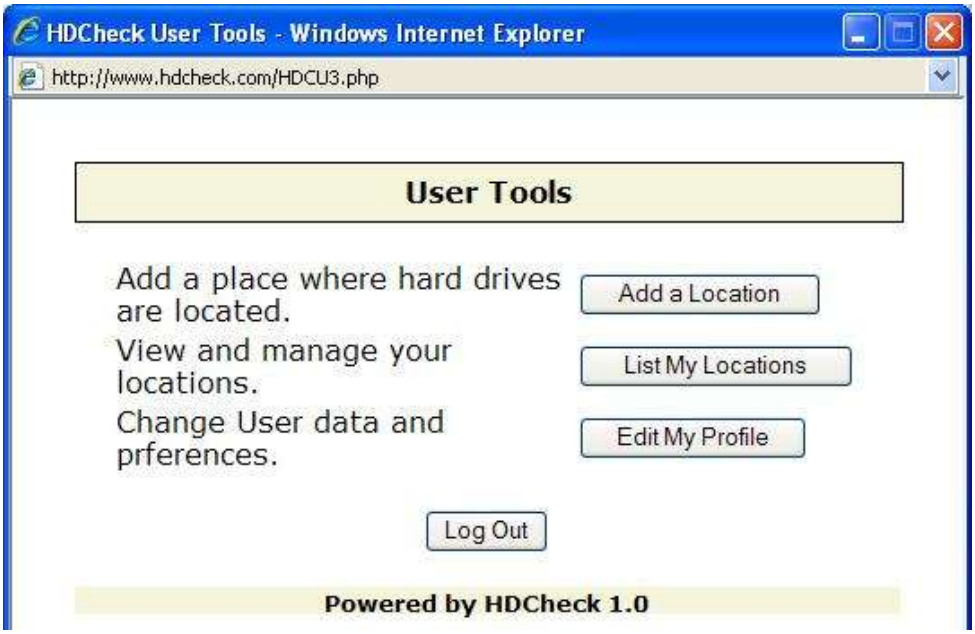
If you want to go ahead with the account setup click on **Log In** button and log in using your User ID and password. If you have forgotten your password, there is an easy way to recover it. Just click on **E-mail my Password** button and HDCHeck.com will e-mail your password to your primary e-mail address.



If you authentication is successful, you will get a confirmation like this:

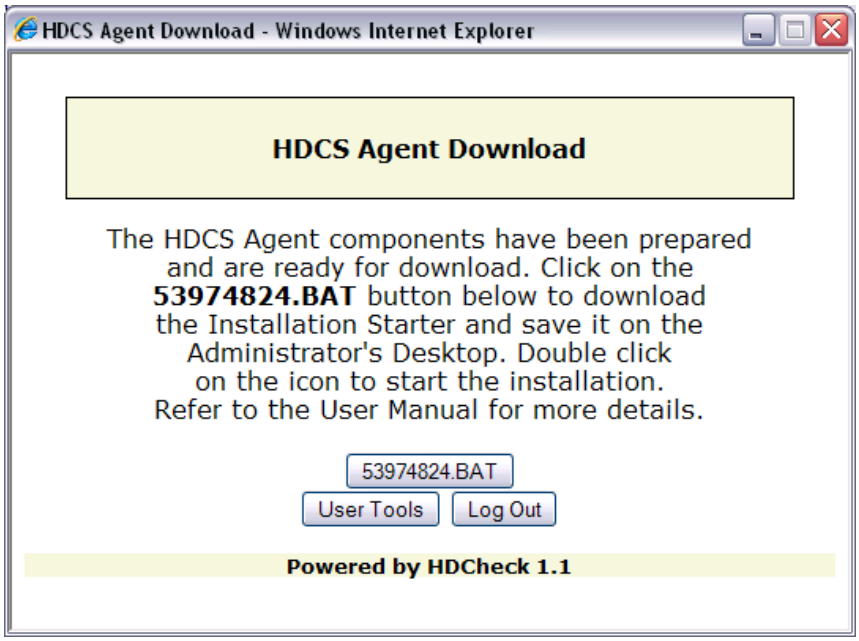


The **User Tools** window is the entry point for account management, but it has a significant role in the account setup. Now, you can choose the setup you want. If you click on **Default Setup**, you will get an HDCS Agent that will support one computer with one hard drive. If you click on User Tools you will see the following window.



3.4 Download and Install the HDCS Agent

The HDCS Agent is a group of programs that collect S.M.A.R.T. data from your hard drive and send it to HDCHeck.com for processing. It will be automatically installed by a program downloaded from HDCHeck.com. If you clicked on **Default Setup** button from the HDCS Authentication panel or the **Download the Agent** button from the Locations Management you will see:



Click on the **xxxxxxxx.BAT** button and save the file on your Administrator's Desktop. When the download finishes, log out and close the window.

Now double click on the already saved batch file. If you see a positive confirmation, you are done. Just press any key. If you got any error messages, try to troubleshoot the case and execute the script again. If the problem still exists, use our Help desk to browse the knowledge base or open a support ticket.

If the installation is successful, you will see acknowledgment for the first check-up in a browser window and then get your first report. Check your e-mail to see it.

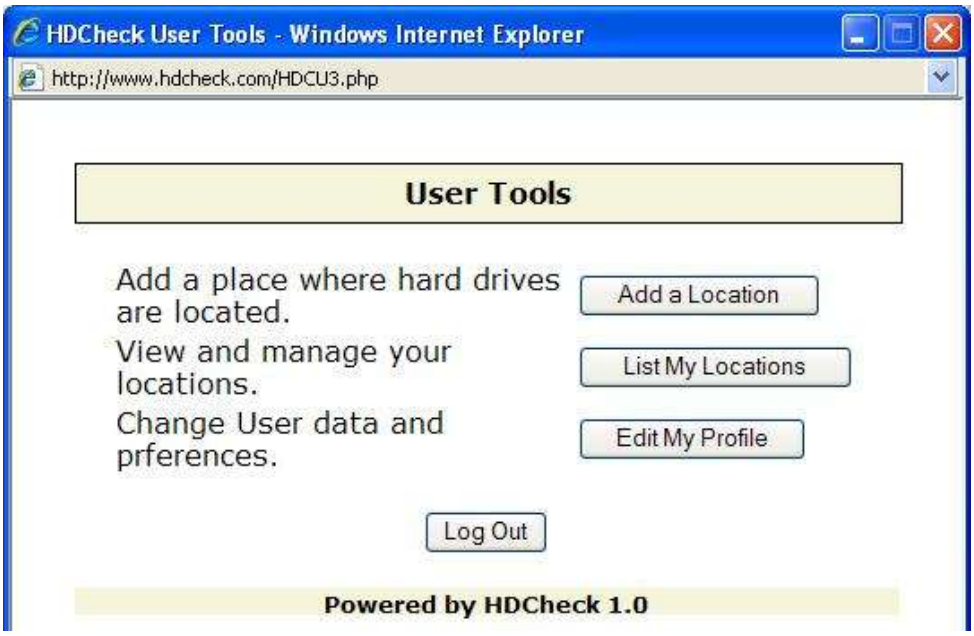
4. User Account Maintenance

You can change your account settings any time you wish. The gateway to the service related tasks is in the web page under the **My Account** tab. You will see two buttons on the right.

4.1 User Log In

Click on **User Log In** button and log in using your **User ID** and **password**. If you have forgotten your password, you have an option to recover it. Click on the **Send My Password** button and your password will be sent to your primary e-mail address.

If your authentication is successful, you will get a confirmation message on your screen. The Default Setup was explained in the previous section, so we will focus on the other options. The next step is to get access to your user's tools.



4.2 Edit My Profile

When you click on the Edit My Profile button, you will see a panel like this:

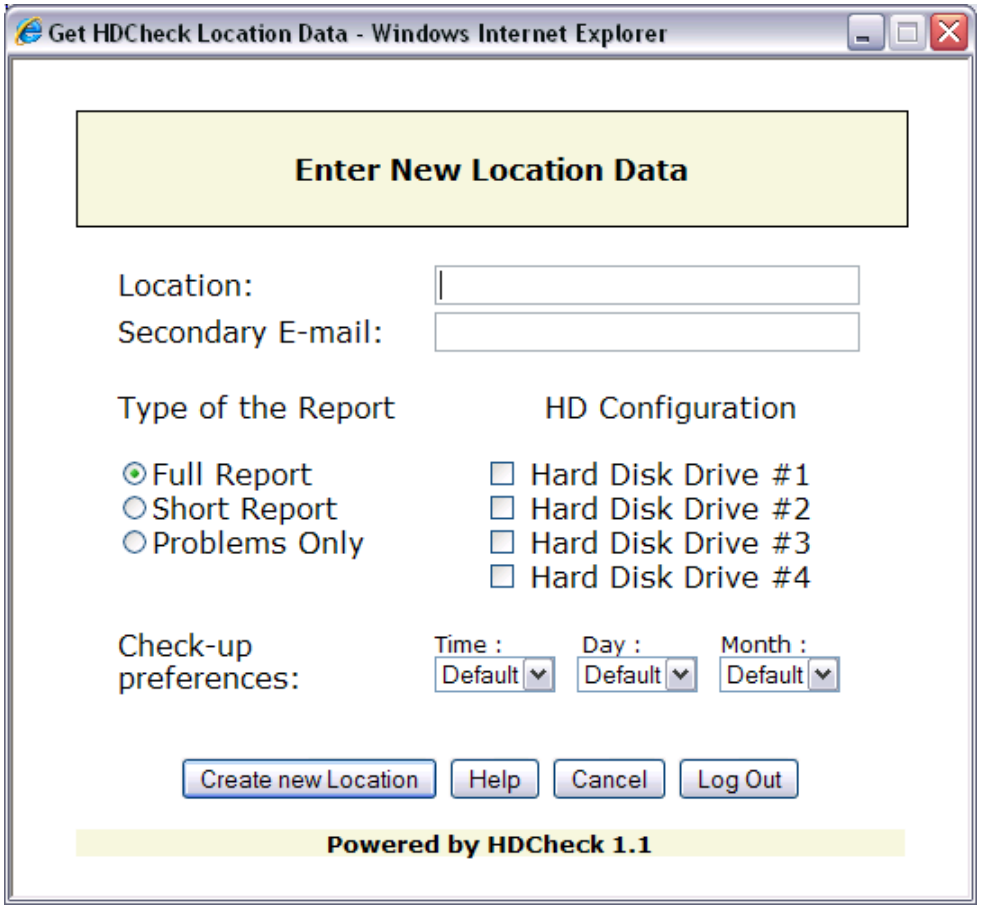
You can change your password and primary e-mail address. Click on **Update My Profile** button to replace the old data. You will get confirmation if the update is successful.

4.3 Add a Location to your Account

To start using the HDCS, you have to add at least one location. Location refers to the physical location of the computer in which the hard drive is. You can add any number of locations at any time.

In the **Location info** field, enter a short description (1 to 32 characters) of where the particular hard disk configuration exists. **The same rules as for the User ID apply.**

In the **Secondary e-mail** field, enter an e-mail address (up to 60 characters) where you will receive all reports associated with that particular location. **The same rules as for the primary e-mail address apply**.



Hard Disk Configuration specifies the hard drives that you want to be monitored. Each Location may have up to four hard disks per computer and the **way they are connected to the system board is very important**. If you are not sure about that, check how BIOS recognizes your hard drives or refer to your computer's User Manual for more details.

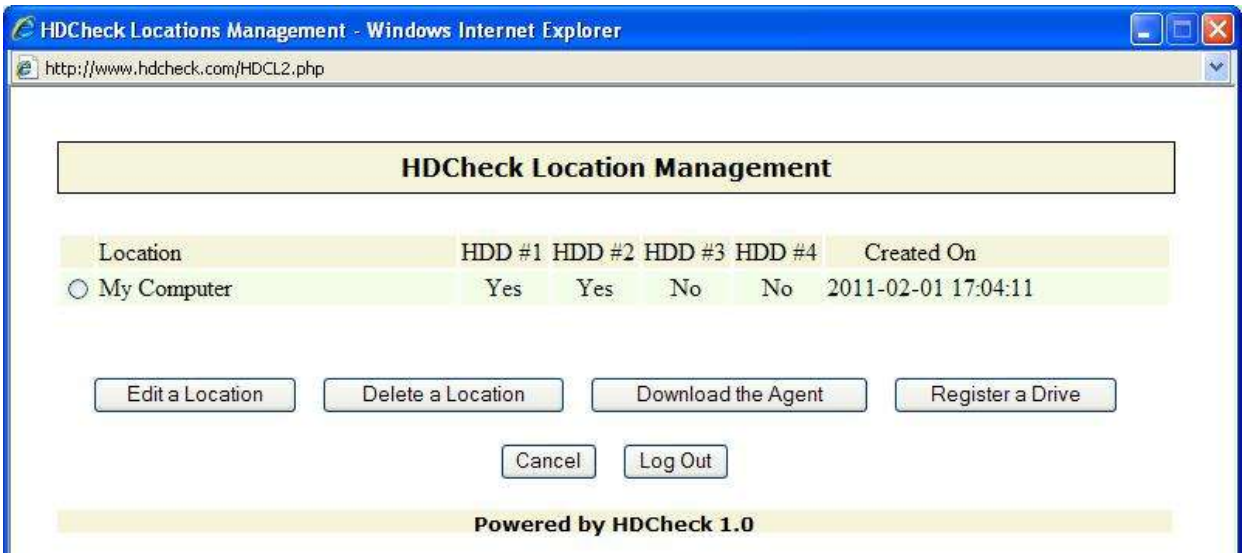
You can choose the type of report you'll receive. The full report will give you the maximum information about your hard drive. The short report will give you only a conclusion about the overall performance. If you choose the problems only report, you will receive a report only if there is a problem with your hard drive.

There is an option to setup the Check-up schedule. It is recommended to choose a time and day when the computer is more likely to be turned on. Defaults mean any hour between 8 am to 8pm during weekdays. If you choose a month, the computer will be tested during that month only.

When you are ready, click on the **Create New Location** button and you will see a confirmation like this:

4.3 Edit Location Data

Click on **Locations Management** button from the **User Tools** panel and you will get the Location Management panel.



Check the radio button in front of the location you want to work with and click on the **Edit a Location** button. You will get a panel similar to the Add new location one, but filled with current data.

If you have to change the location description or the secondary e-mail address just update the location data. If you change the HD configuration, type of the report or the checking schedule, **you have to download and install a new HDCS Agent**.

3.4 Download and Install the HDCS Agent

Each HDCS Agent is specific for the particular location. Hard Disk Check Service keeps track of all sent S.M.A.R.T. reports based on an eight digit token, so you cannot use the same agent for different locations. In other words, **each location must have its own specific HDCS Agent**.

To create and download that specific HDCS Agent, click on the **Locations Management** button from the **User Tools** panel as mentioned above.

Check the radio button in front of the location you want to work with and click on the **Download the Agent** button. If everything is fine, you will get a new window saying that the HDCS Agent components have been prepared and are ready for download.

How to download and install the HDCS Agent was explain in section 3.4. Please refer to that section for more details.

4.4 Delete a Location

Check the radio button in front of the location you want to work with and click on the **Delete a Location** button. You will get a warning panel shown below.

There is not easy recovery procedure to add this location to your account again. The HDCS assigns a new token to each new location and links that token to the registration. **If you delete a location, you will lose the registration fee to the end of the registration term**.

4.5 Register a Drive

Check the radio button in front of the location you want to process with and click on **Register a Drive** button. You will get a warning panel shown below.

5. HDCS Reports

HDCS reports will be sent to your primary e-mail. A copy of the report will be sent to the secondary e-mail if you provided one.

The Full report has five sections. The first identifies the user and the location of the hard drive. The second identifies the particular hard drive and shows the time it was tested. The third shows the self-test results. The fourth shows the raw data for some important attributes that are related to hard drive health. The fifth section is summary for the overall performance of the drive.

```
Hard Disk Check Service Report

User ID : User
Location: My Computer

INFORMATION SECTION:
Model Family:     Western Digital Caviar family
Device Model:     WDC WD400BB-00DKA0
Serial Number:    WD-WCAHM1022491
User Capacity:    40,020,664,320 bytes
Local Time is:    Tue Jan 04 17:41:01 2011 EST

TEST RESULTS:
SMART overall-health self-assessment test result: PASSED
Short offline test was Completed without error
SMART Error Log: No Errors Logged

IMPORTANT ATRIBUTES DATA:
  3 Spin_Up_Time           1891
  4 Start_Stop_Count       1478
  5 Reallocated_Sector_Ct  56
  9 Power_On_Hours         3198
194 Temperature_Celsius    37
196 Reallocated_Event_Count12

OVERAL PERFORMANCE:
WARNING! This hard drive has bad sectors.
WARNING! There are attempts to transfer data from reallocated
sectors to a spare area.
Consult a PC technician about the problems mentioned above.
```

The example above shows some problems. If you are not sure what they mean, please consult a technician.

The short report has only three sections: Identification, Information and Overall performance. Thus, it is a subset of the Full report.

If you have chosen to receive a report when there is a problem, you will get a full report when there is an issue that you have to know about. In addition, once a month, you will receive a message on how many times the hard drive was checked.

If the HDD is not in the Smartctl database, we cannot support it. You will receive an e-mail like this:

```
Hard Disk Check Service Report

User ID : User
Location: My Computer

INFORMATION SECTION:
Model Family:     Western Digital Caviar family
Device Model:     WDC WD400BB-00DKA0
Serial Number:    WD-WCAHM1022491

Sorry, but this HDD is not supported.
```

If the evaluation period a particular HDD is over but you still check you drive, you will receive an e-mail like this:

```
Hard Disk Check Service Report

User ID : User
Location: My Computer

INFORMATION SECTION:
Model Family:     Western Digital Caviar family
Device Model:     WDC WD400BB-00DKA0
Serial Number:    WD-WCAHM1022491

Sorry, but this HDD is not in service.
You have to register the drive in order to proceed with the
report.
```

6. HDCS Troubleshooting

Hard Disk Check Service uses a simple and straight-forward technology. However, in certain situations, some problems may occur.

6.1 The HDCS Agent is not able to send the S.M.A.R.T. report to the server

If you got a message like the one below, you may have problems with sending S.M.A.R.T. reports to the server.

```
Unable to open 87886293.HD1 report file.
The report file was not uploaded.
Refer to the HDCS User Manual for troubleshooting.
```

As it was mentioned before, HDCS is based on two steps: Gathering the S.M.A.R.T. data from the hard drive and sending it to the HDCheck.com server for processing. Things like firewalls, port closings, local and group policy can prevent this from happening.

To make sure that this is the cause, try to "ping" HDCHeck.com. Run CMD and after that enter **`ping hdcheck.com.`** If you get a positive response, the problem is most likely caused by an error during the installation process. Follow the steps in Section 3 and re-install the product.

If you work on a computer that is not a part of a corporate network, simply unblock HDCS from your firewall when you are prompted and try again. If the computer is a part of a corporate network, consult the network administrator responsible.

6.2 You do not receive HDCS Reports

If you got a confirmation that the report was sent but you did not receive it, the most possible cause can be e-mail filtering. Check your spam folder or your spam filtering settings and put HDCheck.com in your "white list."

6.3 Problems with HDD configuration

Setting up the HDD configuration can be tricky. Older computers usually have Parallel ATA (PATA) drives. New computers usually have Serial ATA (SATA) drives. There are computers that have both.

If you have only PATA drives, Drive #1 is the Primary Master, Drive #2 is the Primary Slave, Drive #3 is the Secondary Master and Drive #4 is the Secondary Slave.

If you have only SATA drives, Drive #1 is SATA1, Drive #2 is SATA2, Drive #3 is SATA3 and Drive #4 is SATA4.

If you have both (PATA and SATA) drive working together, the case can be complicated. Usually, you will have one standard PATA 40 pin connector and two SATA (SATA1 and SATA2) connectors. Usually, the SATA drives come first. In this case, Drive #1 is SATA1, Drive #2 is SATA2, Drive #3 is PATA1 and Drive #4 is PATA2 if PATA drives are set as Cable Select (CS). If you use Master and Slave, Drive #3 is the Primary Master and Drive #4 is the Primary Slave.

If you want to verify the HDD configuration, you have to use the BIOS Setup Utility. Refer to your computer User Manual on how to start that utility. Some other utilities like FDISK, Partition Magic, Windows Setup utility etc. can be useful too.

6.4. Getting an Unusual/False Report

If you got a report like this:

```
INFORMATION SECTION:
Device Model:     Generic STORAGE DEVICE
Serial Number:    [No Information Found]
Sorry, but this HDD is not supported.
```

You may have checked your CD/DVD drive instead of your hard drive. Reconnect the drives or change the Location configuration in HDCS to match the real connection.