

## HOWTO: STORAGE HDD drives sharing.

Most computer systems run out of space. It happens sooner or later but it happens. There're dozen of options to resolve this. You can purchase new HDD with larger capacity or purchase one more HDD (if system still permits it) or purchase external HDD (aren't they slow?). But there's an alternative way to do that. Suppose you have old desktop computer or server with pretty solid storage reserves and you are willing to use them from your new PC or notebook. But network sharing just is not enough for you - you would rather prefer to have these additional storages as your local devices so that you could easily install and run software and perform all the majority of other disk related operations with them.

There is a solution exists. We would recommend StarWind iSCSI target combined with any iSCSI initiator (surprisingly we would recommend our StarPort) for this. StarWind makes it possible to share the storage media devices over the TCP/IP network (that is virtually over any intranet network). After the software properly configured system recognizes any remote device as physically attached to your very own computer and you can work with the device as if you were working with your local drive.

The trial versions of both products can be downloaded from RDS's site (<http://www.rocketdivision.com/>). Installation procedure is pretty trivial and should not cause any problems if you have installed single computer program before.

After the software has been installed it is necessary to configure it so that you can accomplish the desired task.

There are two main parts of the program. First is StarWind service that actually does all the work behind the scene (shares and mounts devices, manages them etc). The service should be started on the computer where you have the actual device you are going to share. Another one is StarWind console which is GUI interface for the service. It can be installed on the different computer or on the same computer you are installing the service on (the default setup behavior).

There are several alternative methods to share the device with StarWind. Depending of the physical nature of the storage you can share:

- 1) Image File device
- 2) SPTI device
- 3) IBVolume device

Let's review these options in the more detailed fashion...

### Image File device.

This tool enables you to create virtual iSCSI HDD using the space of your real physical HDD. The resulting iSCSI storage will have the same structure as "normal" HDD (and you can perform any HDD-related operation with this virtual HDD - format it. Copy files to and from it, install programs on it) and will be represented as the file on this HDD. It means when you will connect to the system with the Image File Device and properly mount the latter it will appear as standard HDD on your system (computer from which you are connecting) while on the system where you actually created the image file device it will be represented as ordinal file.

There're very few shortcomings of this approach:

1) Virtual HDD uses the space of real physical HDD so if you will create the image file with the size close to the size of its host HDD you won't be able to copy any additional files on that disk.

2) There's no way to change the capacity of the image file after it was created so you should be careful when planning your storage system design.

These shortcomings are obviously coming from the nature of the described method and actually no worse than using physical HDD (which also has limited space and cannot be dynamically adjusted).

### **SPTI device.**

With this tool you can share any physical device. No need to create image file - you just share the entire device as it is. All the space is yours. You sit on your system and have the HDD stored in other system as if it were your own local disk.

There's only one shortcoming here. You cannot access the device shared through the SPTI from more than one system at a time. You will not be able to access the HDD even from the computer it is physically attached to. Only one system at a time can work with the SPTI shared device. No exception or all data will be lost. Beware!

### **IBVolume device.**

This is the most powerful tool and approach. It also creates virtual device on top of the real one. However its capacity can be adjusted dynamically in the moment you need more space. It means that even if you have created the device with the capacity of 100mb it will be automatically extended to 200mb when you will be copying file of the 200mb on the device. Of course the real HDD should have enough space to permit this (obviously virtual disk cannot be larger than physical unless you deal with cluster).

As a matter of fact IBVolume plugin is much more than just a virtual storage - it can be used as a solid backup system.

The IBVolume plug-in can operate in one of the following modes:

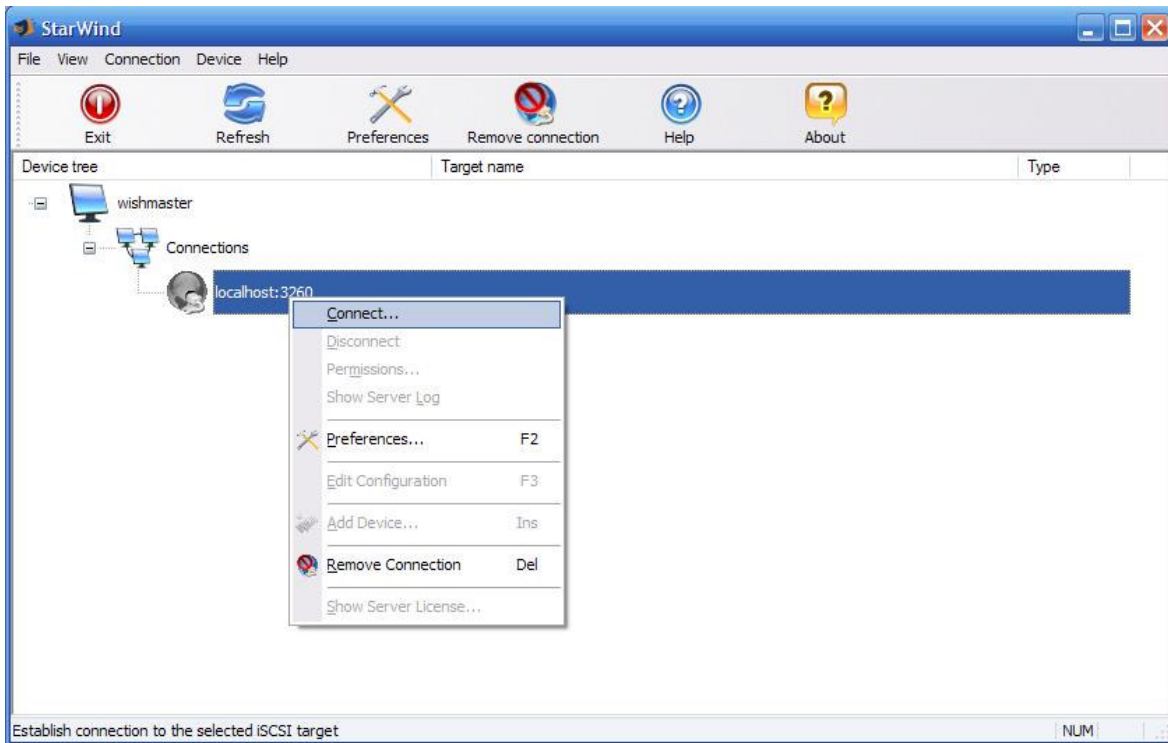
- Growing Image. In this case IBVolume device is used in ImageFile - like manner but with one advantage over ImageFile: disk space is allocated as data is written by initiators to the image, no sectors are allocated for unused sectors.
- Incremental Backup Volume. In this mode each initiator session is written to new journal. (Journals are separate disk files that store data for user sessions).
- Auto- Restored Snapshot. When Operation Mode is set to this value all changes written to the IBVolume device during an initiator session are discarded by the end of that session and when the next session is created it accesses "clean" IBVolume device.
- Read-Only image. In this mode IBVolume images cannot be modified and all initiators have read-only access.

Now as we have discussed possible storage device types let's discuss how we can actually configure them and get the maximum of the functionality they offer.

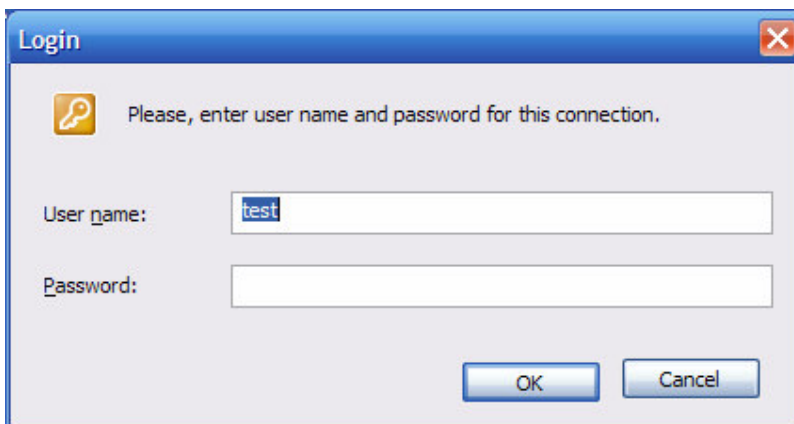
In order to **create the Image File device share** you need:

1) Launch the StarWind console. Start->All Programs->Rocket Division Software->StarWind->StarWind. As soon as console is launched you will see its icon in your tray-bar. Double-click the icon with the right mouse button or single-click it and choose the "Start Management" menu option.

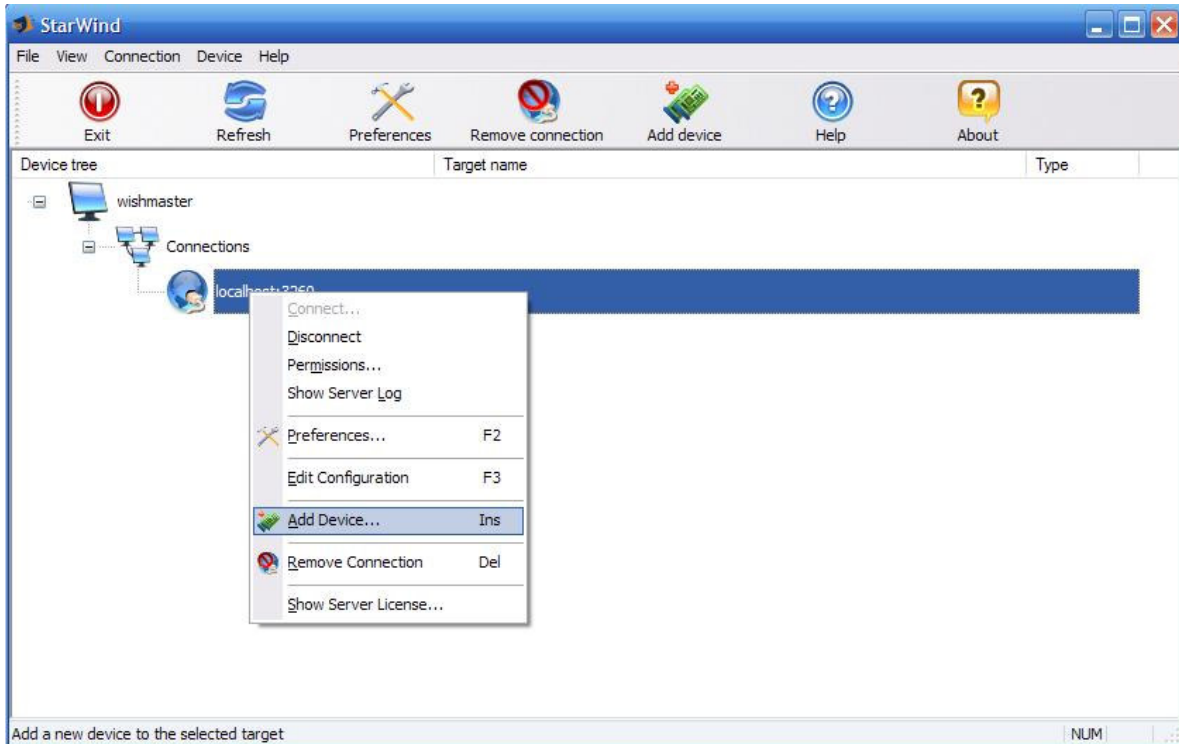
2) From the "Connections" list select the computer on which you are willing to share the device. There's only one item in the list by default - "localhost". If you install the StarWind on the computer you would like to share the device on that will be enough.



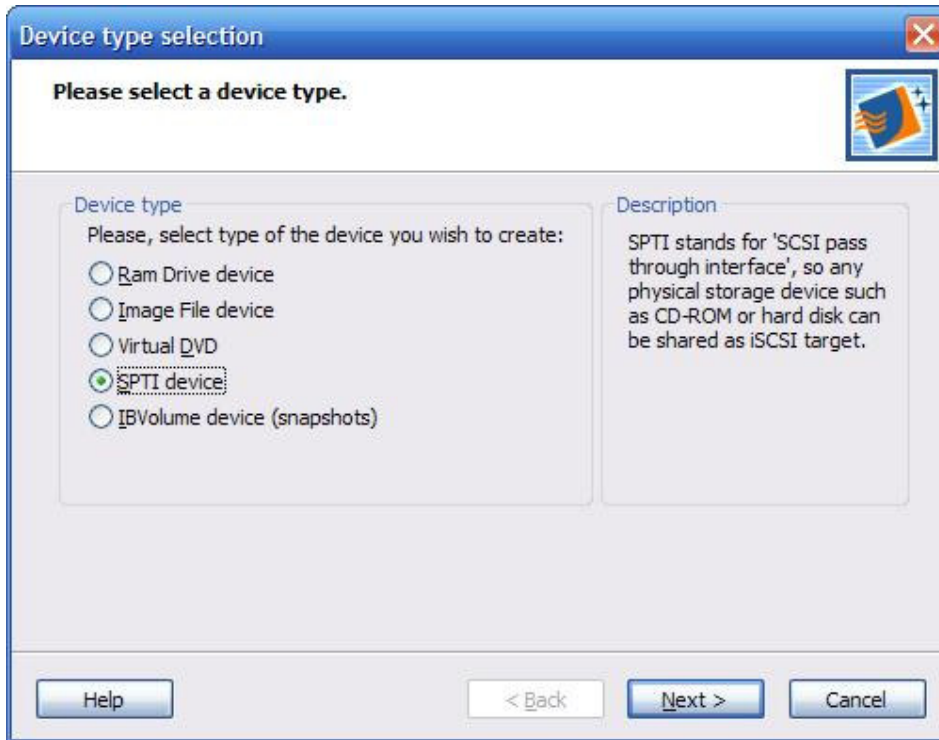
Press the right mouse button over the desired host (computer) and choose the "Connect" option. You will be prompted to enter the login and password. Default ones are: test, test. You can change them later.



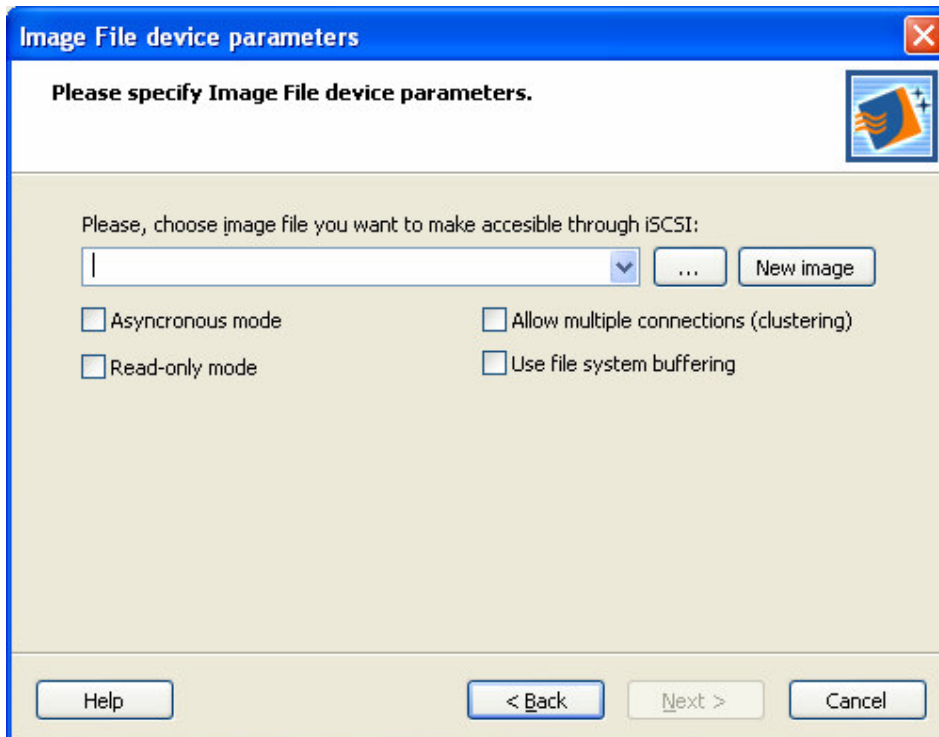
3) As soon as you connected successfully select the "Add device" option in the popup menu. Later on you can use the respective shortcuts for the repeating actions.



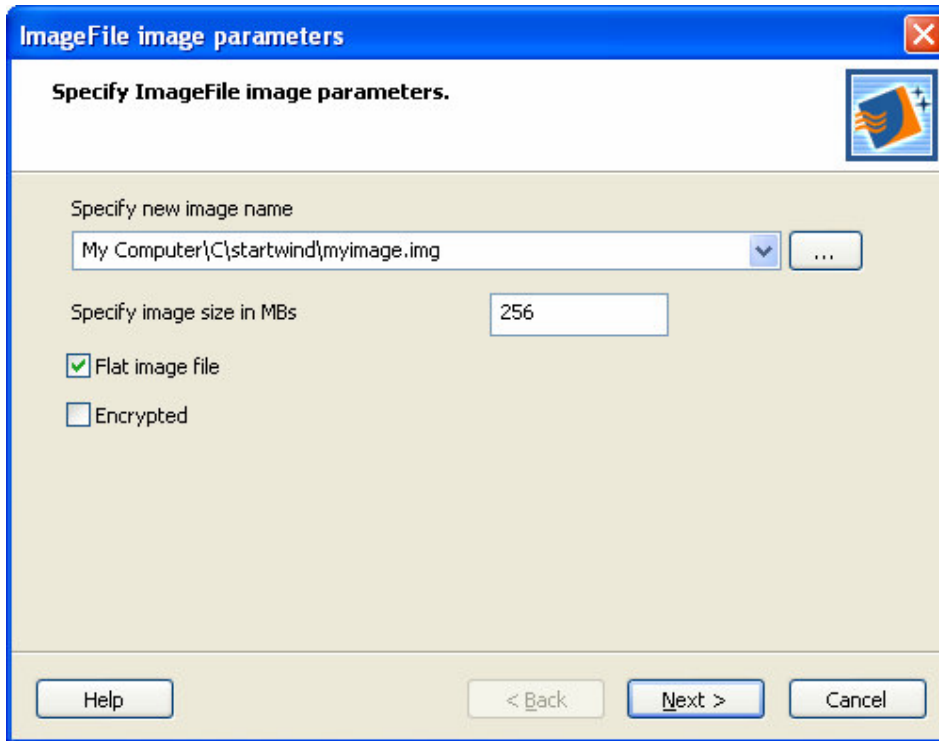
In the appearing wizard in the device type selection choose Image File device (you can read brief description of each possible device type as you select it). Also there's a "Help" button to get you going if any problems arise.



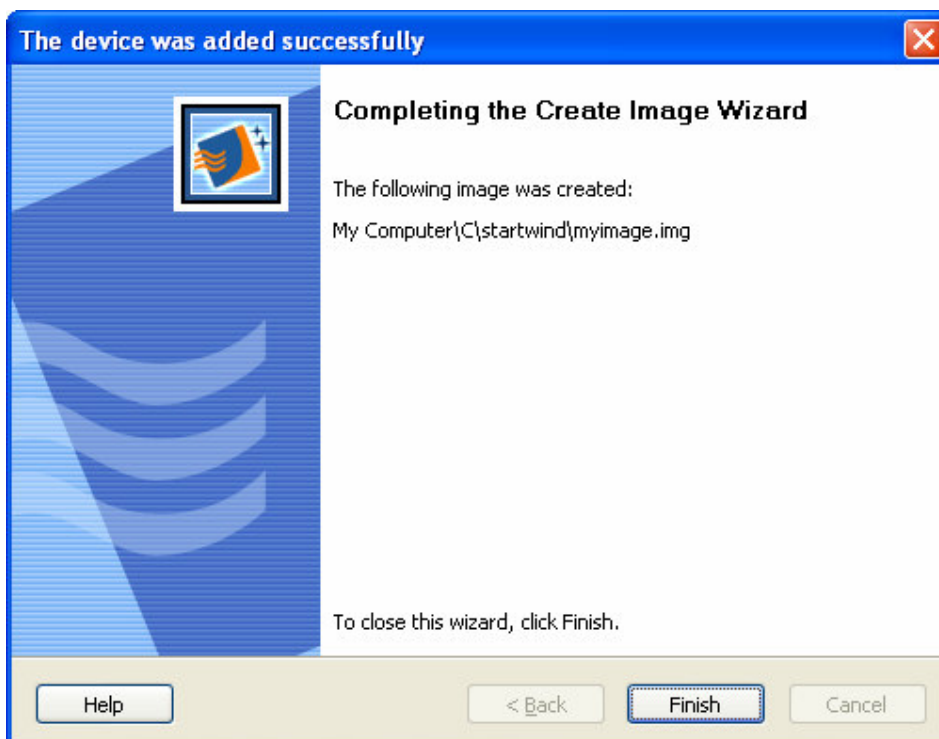
4) Select the image you would like to share by specifying the path to the existing images or create the new one by pressing the "New image" button.



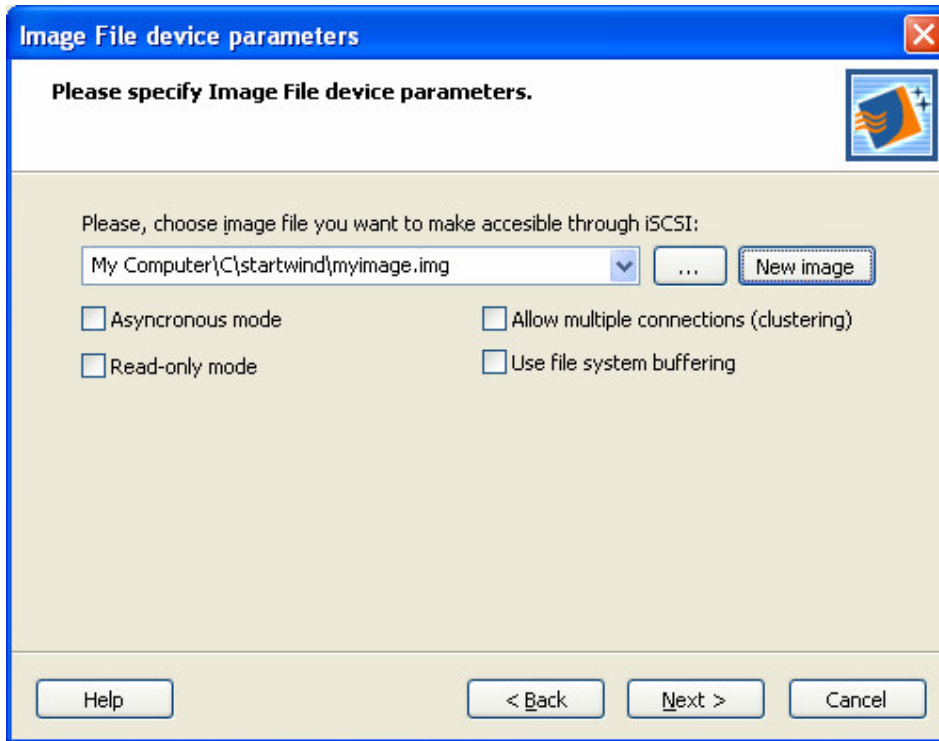
5) If you decided to create new image specify the location of the future image file and the name of the image file to be created. Also you will have to specify the size of the newly created image.



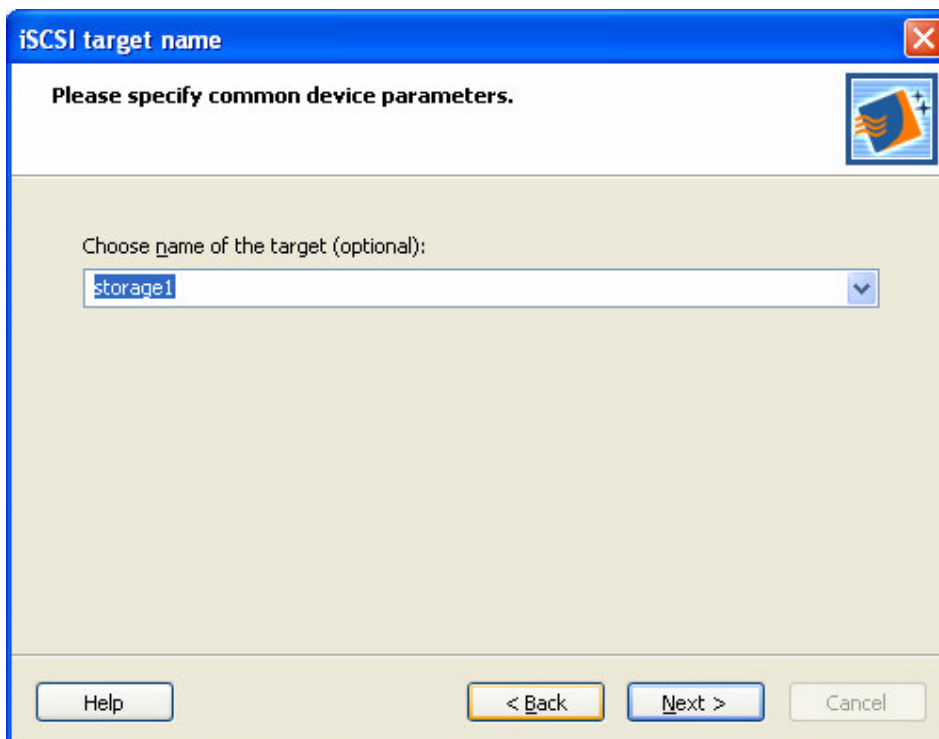
6) Press "Next" and see the information about the image being created successfully, press "Finish": then.



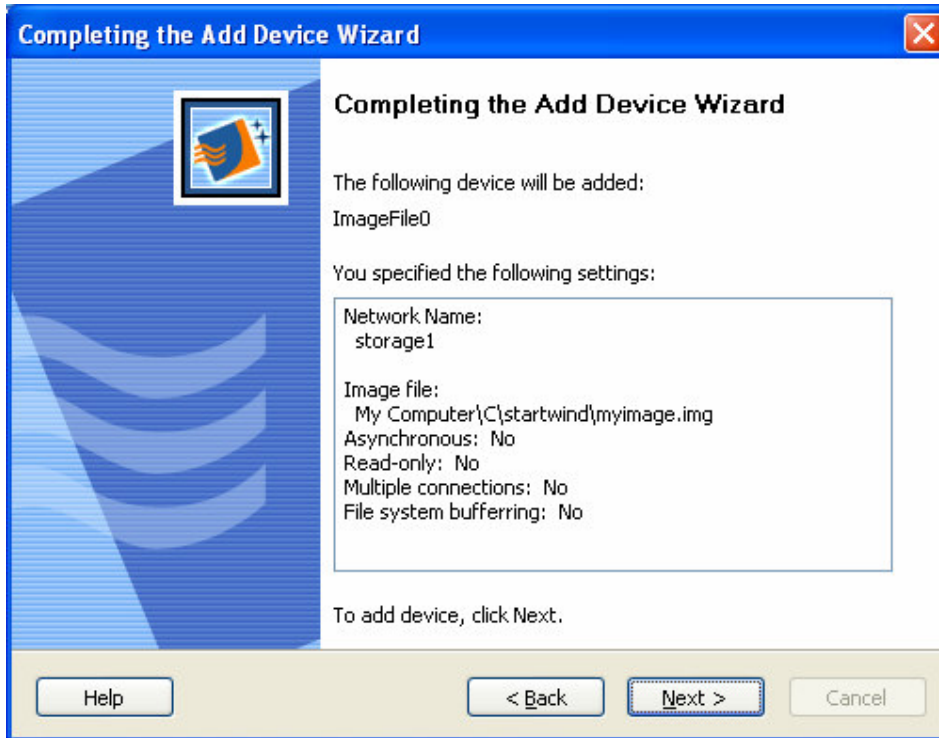
7) On this stage you can specify additional parameters of the image you are creating. Please refer to help system for explanation on what each particular parameter means. Press "Next" when done.



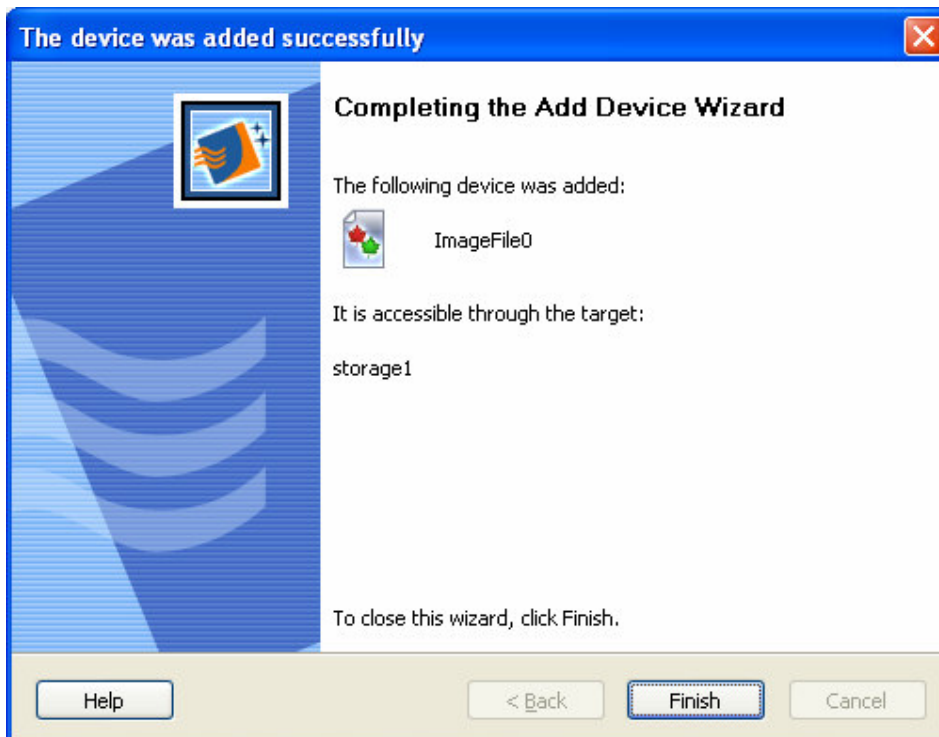
8) Select the name of the target under which the device will be known to the initiators connecting to our StarWind over the network (explained below).



9) Check if the all parameters are ok. Press "Back" if some changes are necessary or "Next" otherwise.



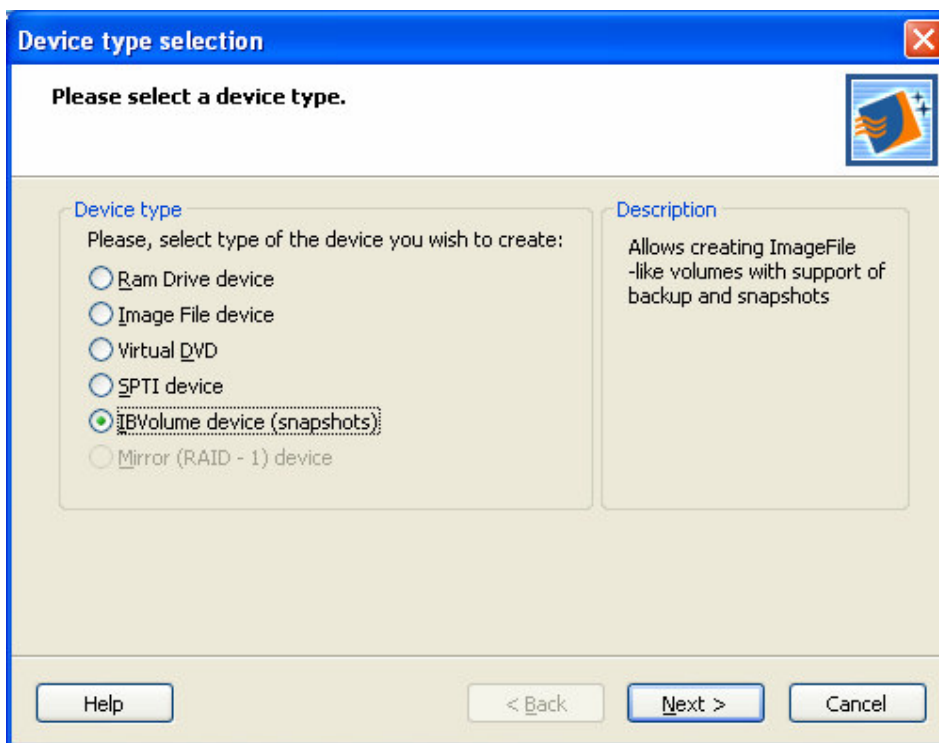
10) With the "Next" you are getting on the final page with the information about the newly created device. The "Finish" does close the wizard.



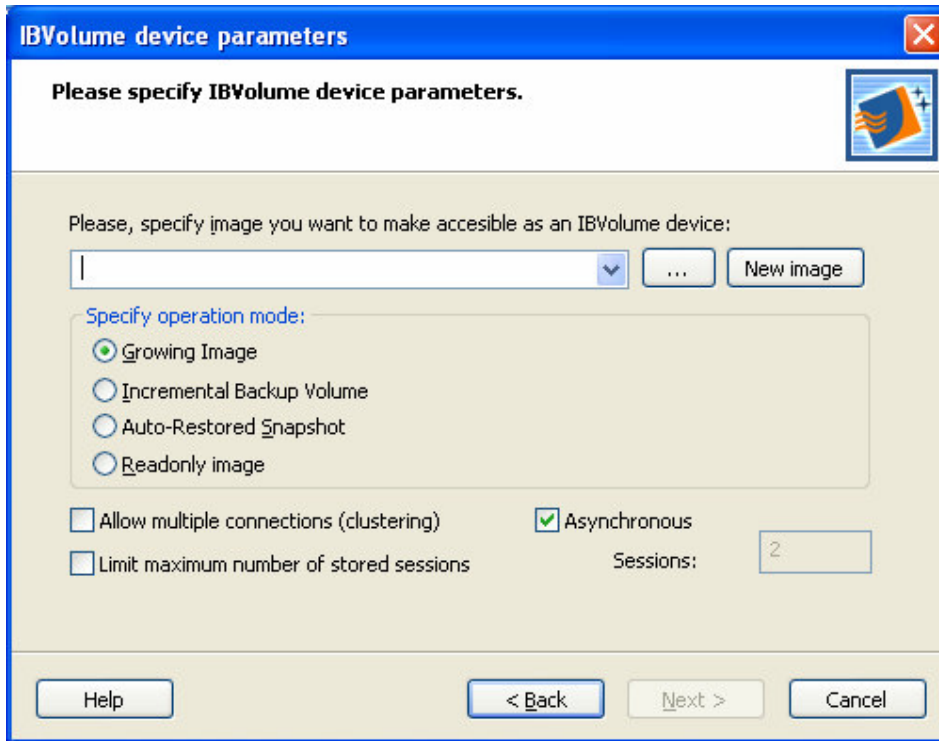
You can always activate the context-enabled help system by pressing the "Help: button.

**Creating of the SPTI share** is discussed in details in the how-to dedicated to the sharing of the CD/DVD. In order to share the HDD all the steps would be the same expect for selecting the HDD instead of CD/DVD device. Please remember that only one system at a time can access the HDD device shared through the SPTI or your data can be destroyed and lost. Beware!

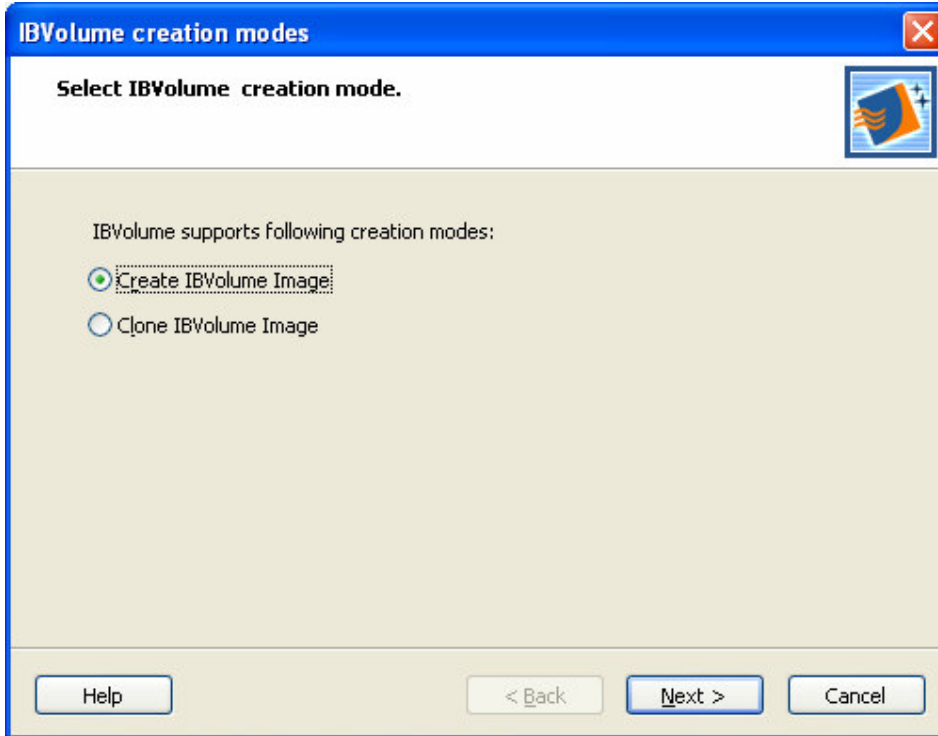
**Creating the IBVolume image** requires pretty much the same start and first three steps except for you will be selecting the IBVolume device on the step 3)



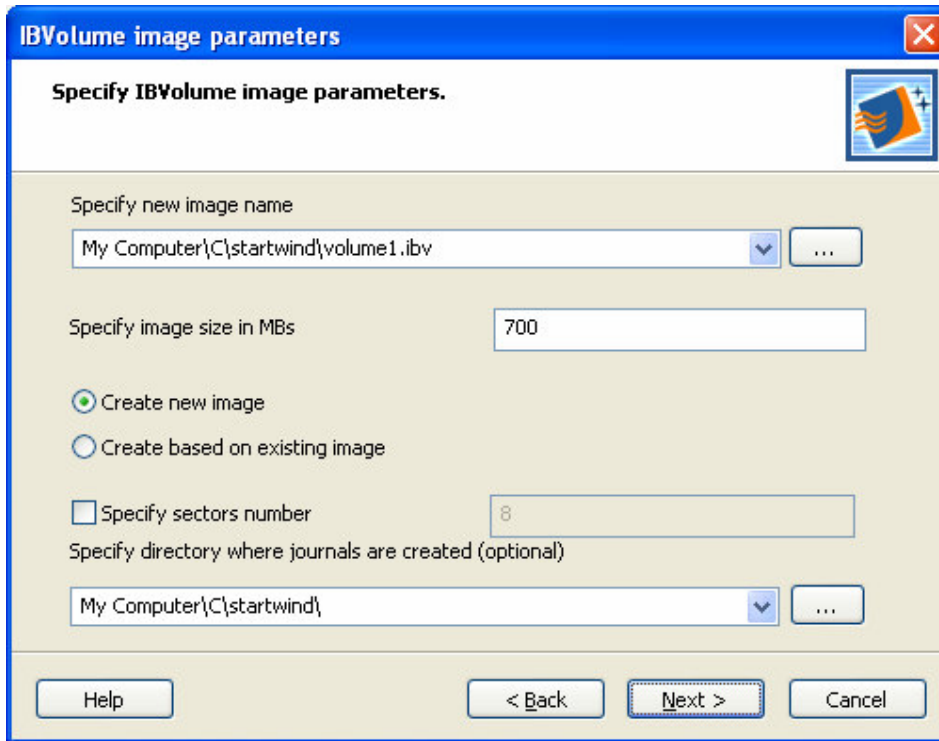
4) Once again select the image you would like to share by specifying the path to the existing images or create the new one by pressing the "New image" button.



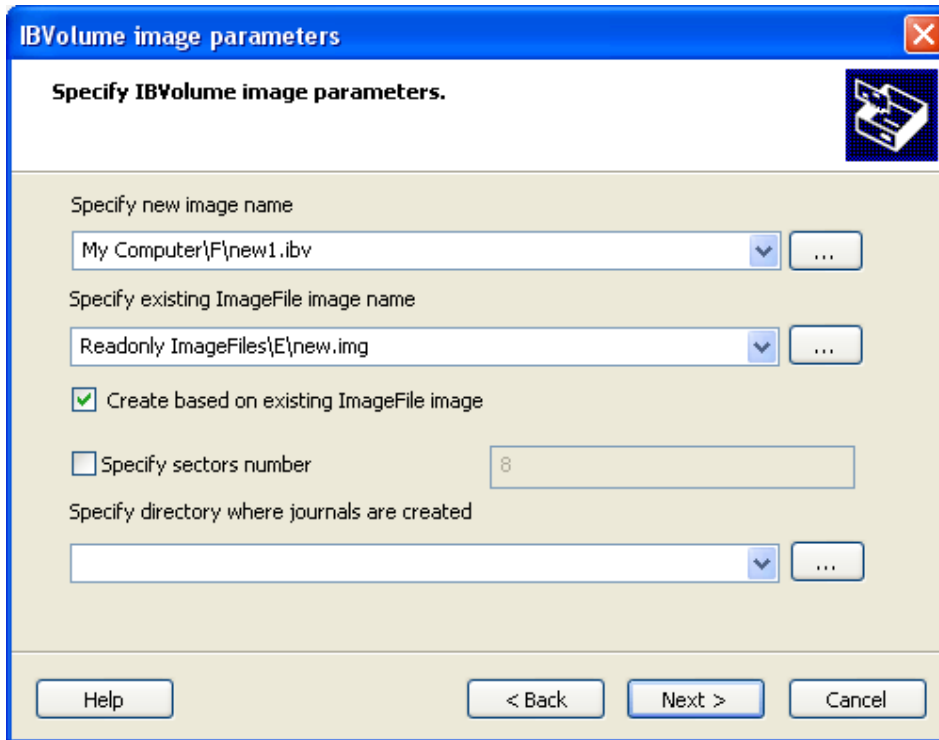
5) There're two possible ways to create IBVolume image - create the new or clone existing. Select the "Create IBVolume image" on the appearing page of the IBVolume device creation wizard (cloning of the existing images will be explained later).



6) In order to simply create IBVolume specify its name and size. A new image with this name will be created after clicking "Next".



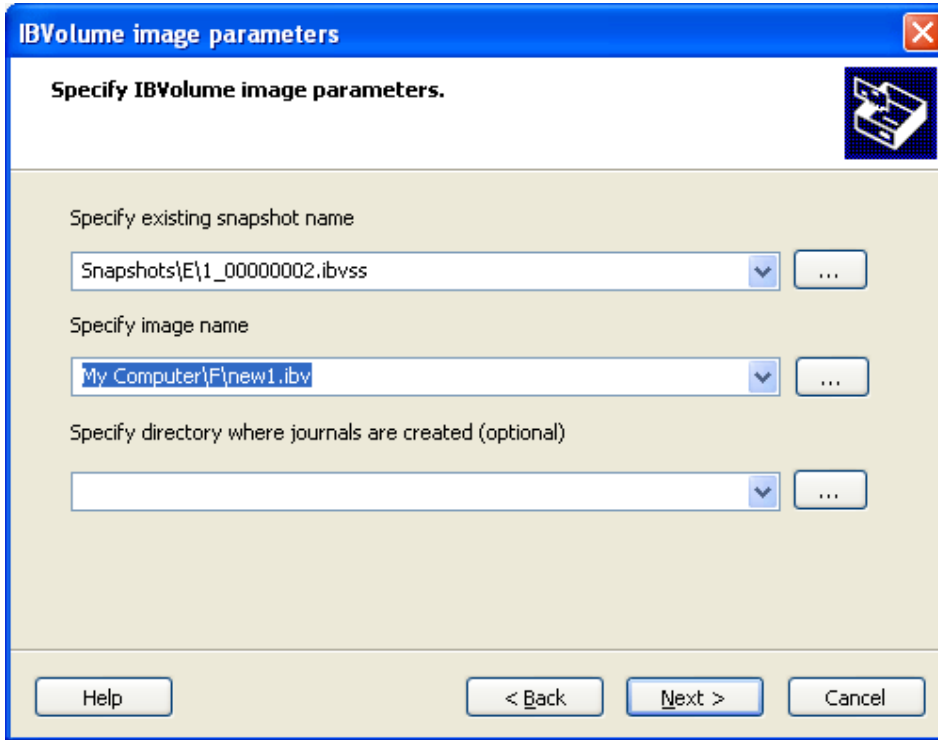
It's also possible to create an IBVolume image from an existing ImageFile image. To do that simply select the 'Create based on existing ImageFile image' checkbox and specify the ImageFile's name. Size of the resulting IBVolume will be set to the size of the ImageFile image.



Experienced users can optionally specify sectors per extent number value and an alternate directory where IBVolume journals will be stored.

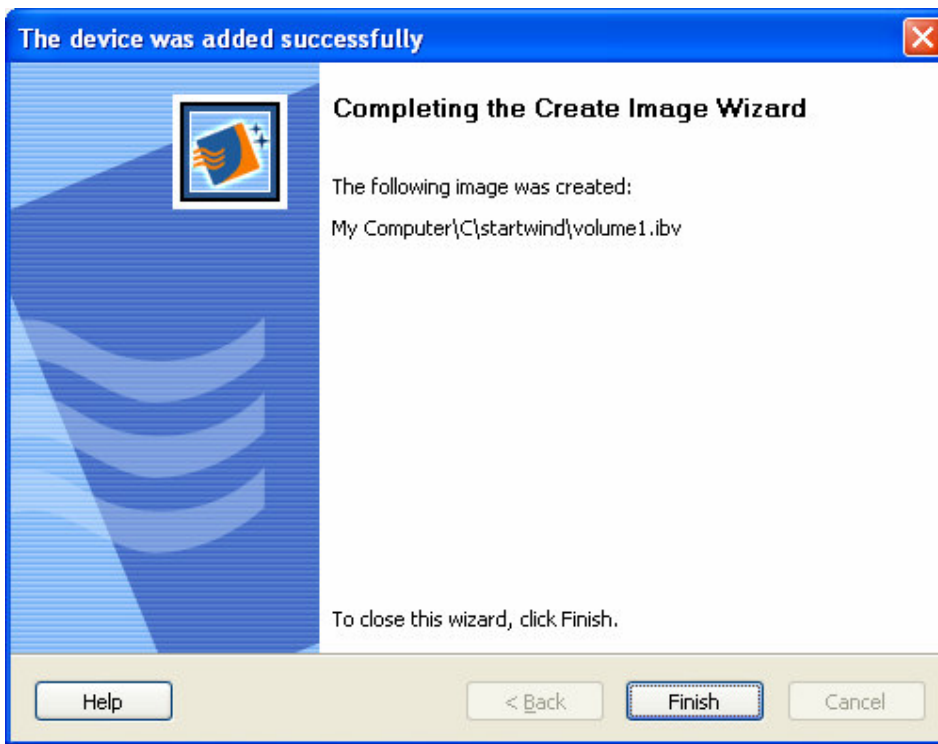
"Extent size" - is number of sectors in a journal block. The more sectors are in a block, the less is size of a map file (\*.ibvm), but more sectors need to be written to journals if a single sector is changed. That's why performance going down with increasing of the extent size parameter. From the other side, using small extent sizes lead to rather large map files that consume much of disk space, but journal files (\*.ibvd) grow not so quickly and overall performance is better as less number of sectors involved into the journaling process on changing a single one.

If Clone IBVolume Image is selected then a snapshot can be used to create a new IBVolume image. In this case all data stored in the snapshot will be shared with the new IBVolume image, but any changes of the new volume will be stored separately.

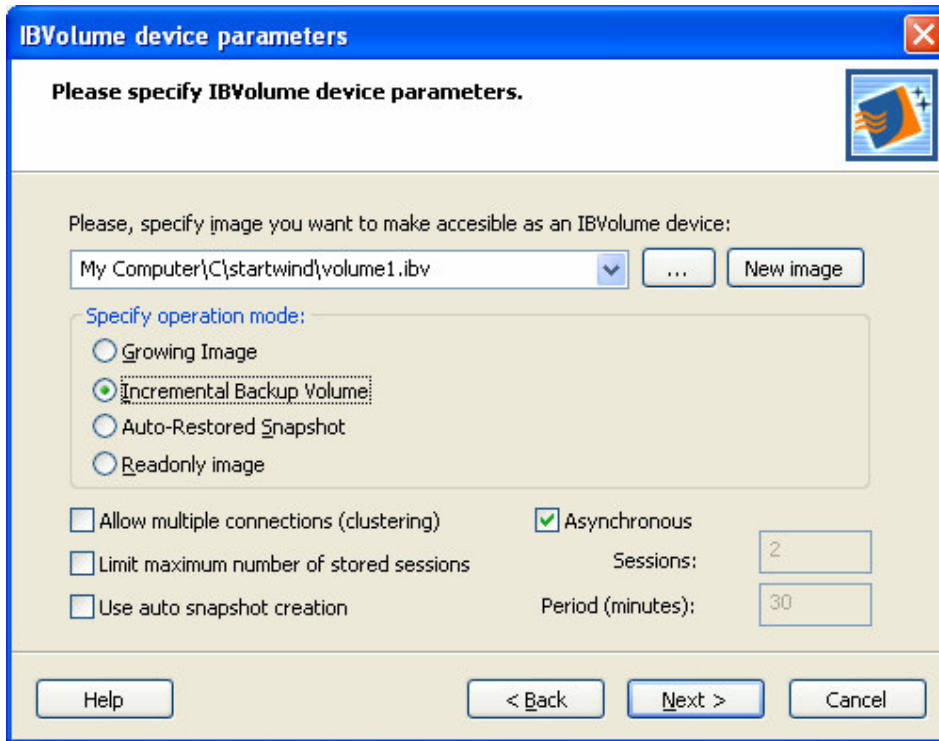


Directory where journals are created can also be specified.

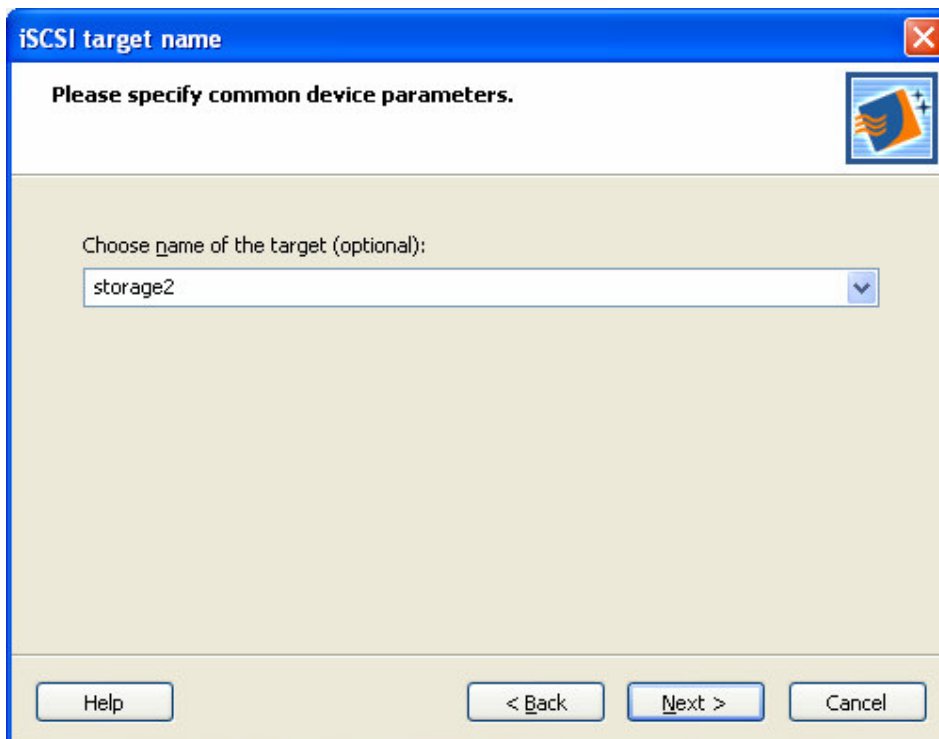
7) On this stage new image file has been created.



8) Now as we have created the image we can select the type of the device operation and other relevant options (explained in the help system in details).



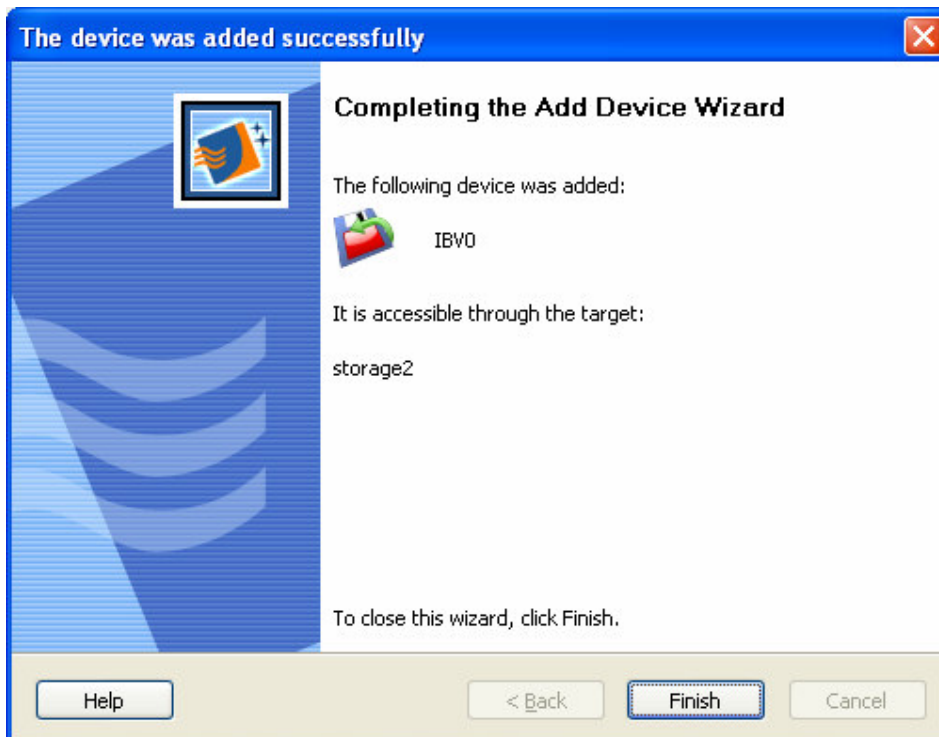
9) Select the name of the target under which the device will be known to the initiators connecting to our StarWind over the network



10) Check if the all parameters are ok. Press "Back" if some changes are necessary or "Next" otherwise.

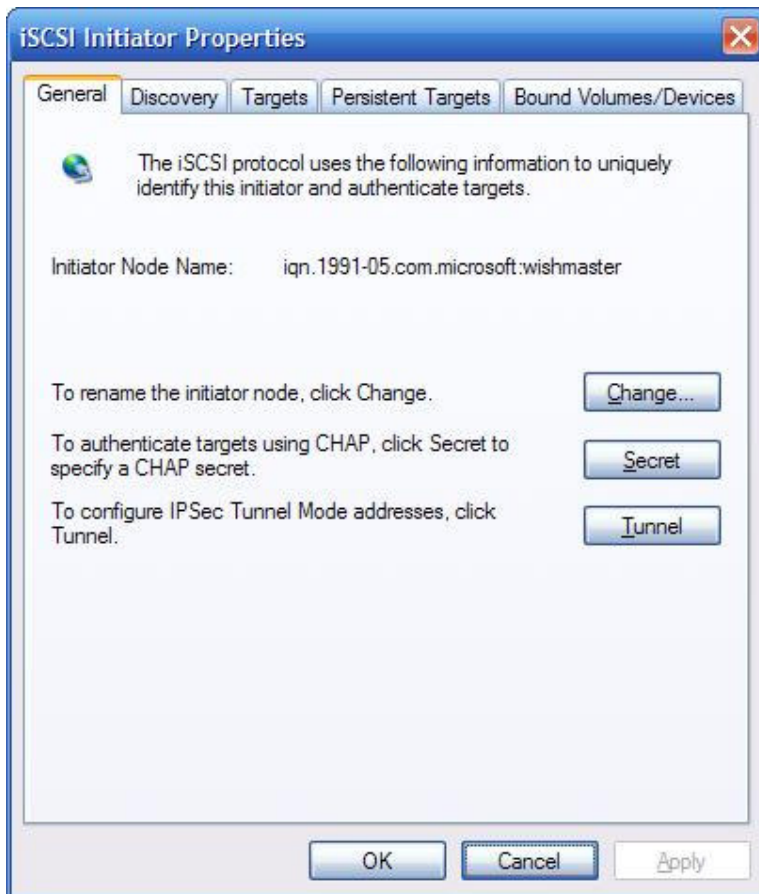


11) With the "Next" you are getting on the final page with the information about the newly created device. The "Finish" does close the wizard...

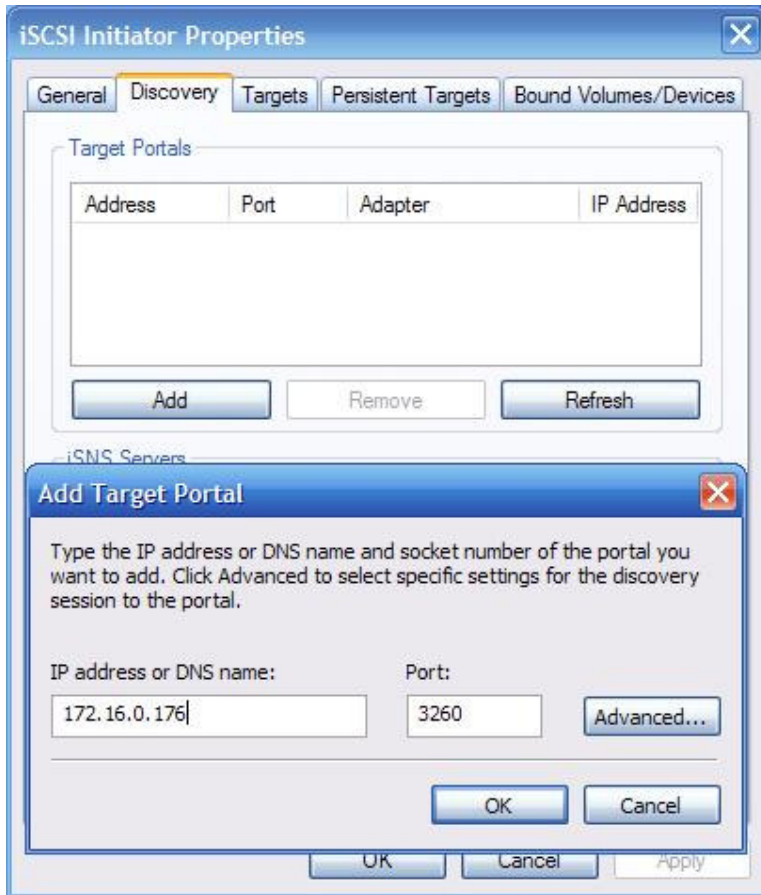


Now to actually mount the device as local on any network computer (something we wanted from the beginning) **you can use any iSCSI initiator**. We recommend our StarPort however any one will do.

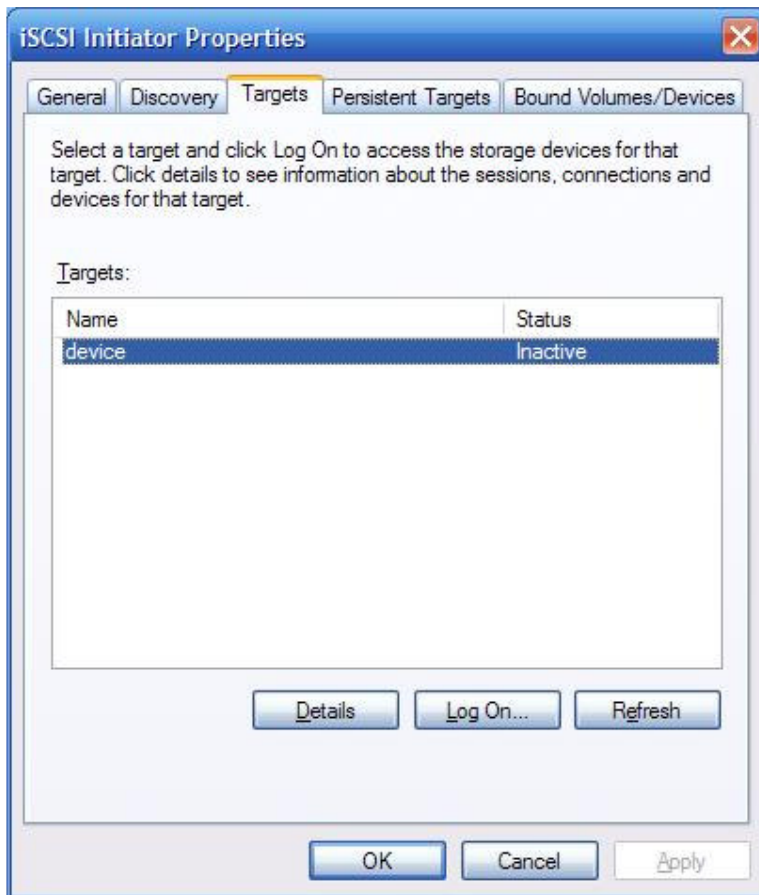
- 1) Launch: Start->All Programs->Microsoft iSCSI Initiator-> Microsoft iSCSI Initiator



2) Select the "Discovery" tab and hit the "Add" button. In the appearing dialog type in the IP address of the computer with StarWind installed and port of that machine. Then click "OK".



3) Selecting the "Targets" tab and there we go! Our previously shared device is visible under its name there.



4) Selecting the device and pressing the "Log On" button. In the appearing dialog additional options can be adjusted. As soon as you are ready hit the "OK" and start using the device as if it were local device on your computer. You have made it.

