IBM FlashCache Storage Accelerator 2.2.0

Administrators Guide for Windows

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Quick start

Below are a links to common tasks that can get you started configuring or managing IBM FlashCache Storage Accelerator for Windows. By default the tasks are described using the GUI interface. However, in some cases, a CLI link in parenthesis has been provided that takes you to a procedure that allows you to accomplish the same task using the CLI.

- Configuring caching with the IBM Flash Management Console (CLI)
- Logging in to the IBM Flash Management Console
- Licensing IBM FlashCache Storage Accelerator
- Managing caching
- Stopping caching
- Changing caching Priority
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- Viewing Live performance graphs
- Updating firmware on an IBM High IOPS device
- Formatting an IBM High IOPS device
- Collecting logs for support

Overview

IBM FlashCache Storage Accelerator provides write-through caching software for Windows hosts that can take advantage of an IBM High IOPS Adapter, Enterprise Value Flash Adapter, or SSD installed on the host. IBM FlashCache Storage Accelerator consists of three main components:

- IBM FlashCache Storage Accelerator caching software
- IBM Flash Management Console
- IBM FlashCache Storage Accelerator command line interface (CLI)

After installing IBM FlashCache Storage Accelerator for Windows on your physical Windows machine, you can configure caching using either the IBM Flash Management Console or the CLI.

IBM FlashCache Storage Accelerator for Windows filters

IBM FlashCache Storage Accelerator for Windows incorporates three caching filters that allow you to distribute caching priority across volumes, disks, or files. By default IBM FlashCache Storage Accelerator use the volume caching filter and applies 100% of the caching IOPS to that filter. However, if you configure IBM FlashCache Storage Accelerator to use other filters you have the option of manually allocating the caching priority to each filter.

To set caching prioirty using IBM Flash Management Console see Caching Priority.

To set caching priority using the CLI see setallshares or setshares.

Prerequisites

- Ensure that the device you want to use for caching has the correct drivers properly configured and is on-line.

Considerations

- IBM FlashCache Storage Accelerator software does not cache data on network file systems (such as CIFS, NFS).
- IBM FlashCache Storage Accelerator software only caches data up to the size limit of the caching device.
- IBM FlashCache Storage Accelerator File-Level Caching
    - IBM FlashCache Storage Accelerator File-Level caching only caches data on the NTFS file systems.
    - IBM FlashCache Storage Accelerator File-Level caching doesn't cache sparse files.
    - IBM FlashCache Storage Accelerator File-Level caching doesn't cache files with the NTFS transactional feature enabled.
    - IBM FlashCache Storage Accelerator File-Level caching doesn't cache non-cached/direct IOs.

- IBM FlashCache Storage Accelerator File-Level caching supports only one paging file (for example, "pagefile.sys") per host. If there is more than one paging file on the host, IBM FlashCache Storage AcceleratorFile-Level caching caches the one opened first.
- IBM FlashCache Storage Accelerator File-Level caching requires a reboot to enable paging file (for example, "pagefile.sys") caching if the paging file is not currently included at the file-level caching.
- IBM FlashCache Storage Accelerator File-Level caching invalidates the cached data at the file level when an NTFS volume is detached regardless of whether there are files in the volume that are cached.

Cache invalidation

The following operations will result in invalidating the cache on the machine. Once invalidated, the cache will take some time to warm.

- Stopping and then restarting caching.
- Changing parameters such as cache page size and cache maximum read/write IO size.
- Changing shares at different caching levels – disk, volume, and file.
- Un-assigning and reassigning caching shares.

Example setup with IBM Flash Management Console

The following procedure is an example of how you might configure IBM FlashCache Storage Accelerator to cache a file system on a Windows machine using the IBM Flash Management Console. This example assumes you have already installed the product according to the instructions in the IBM FlashCache Storage Accelerator Installation and Upgrade Guide.

1. Login to the Windows machine.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

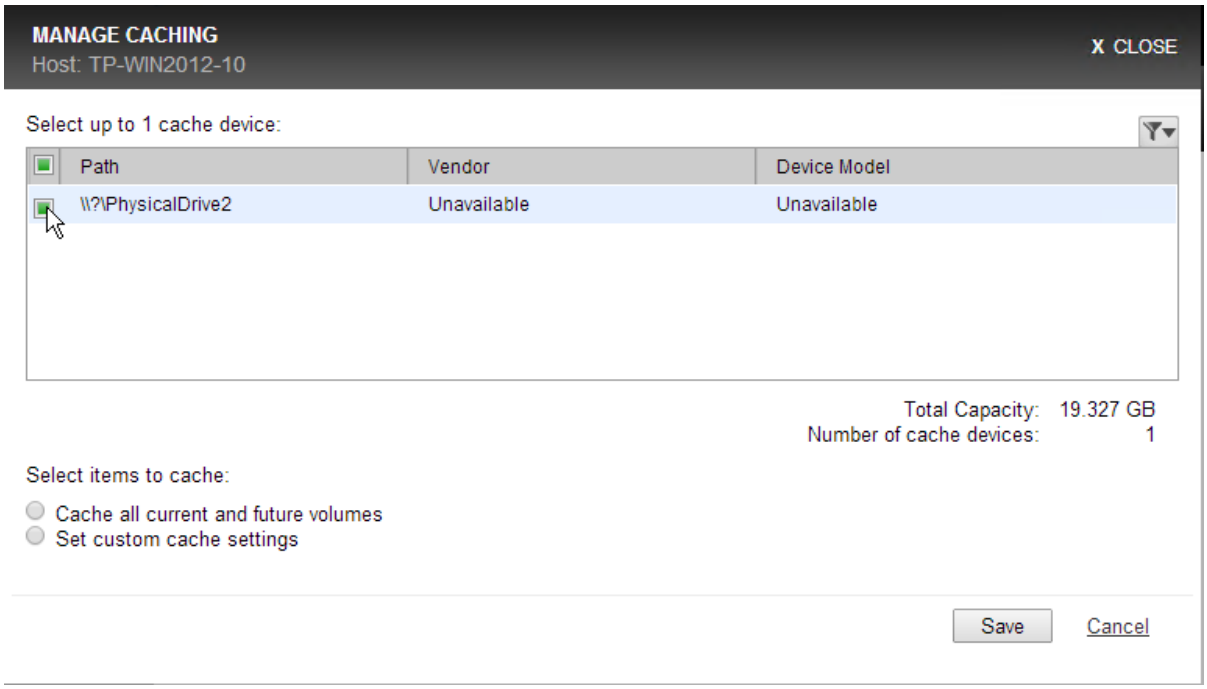
   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

3. Login to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **Hosts.**
6. In the Hosts window, click your hostname.

   The host Configure window displays.

7. On the host Configure tab, click **Manage Caching.**

   You should see the devices available to be used for caching.



8. Click the device you want to use for caching.

Attention!

If you are using a new IBM High IOPS Adapter or Enterprise Value Flash Adapter with factory formatting, IBM FlashCache Storage Accelerator may re-format the device for optimal caching settings when it is selected as a cache device. It is strongly recommended that you let IBM FlashCache Storage Accelerator re-format your IBM High IOPS Adapter or Enterprise Value Flash Adapter.

If you are using an IBM High IOPS Adapter or Enterprise Value Flash Adapter that has been formatted with 512-byte sectors to something other than factory size, IBM FlashCache Storage Accelerator will not change the format. (Any device used for caching that does not use 512-byte sectors will be re-formatted as 512-byte sectors is a requirement for IBM FlashCache Storage Accelerator cache devices.) If you format the device to something other than factory size, it is strongly recommended that the device not be formatted to its maximum size to allow reserve space to improve the longevity and durability of the device.

If you are using an SSD that is not an IBM High IOPS Adapter or Enterprise Value Flash Adapter, follow the manufacturer's instructions for properly formatting the device. IBM FlashCache Storage Accelerator will not use the SSD as a cache device if it is not formatted with 512-byte sectors.

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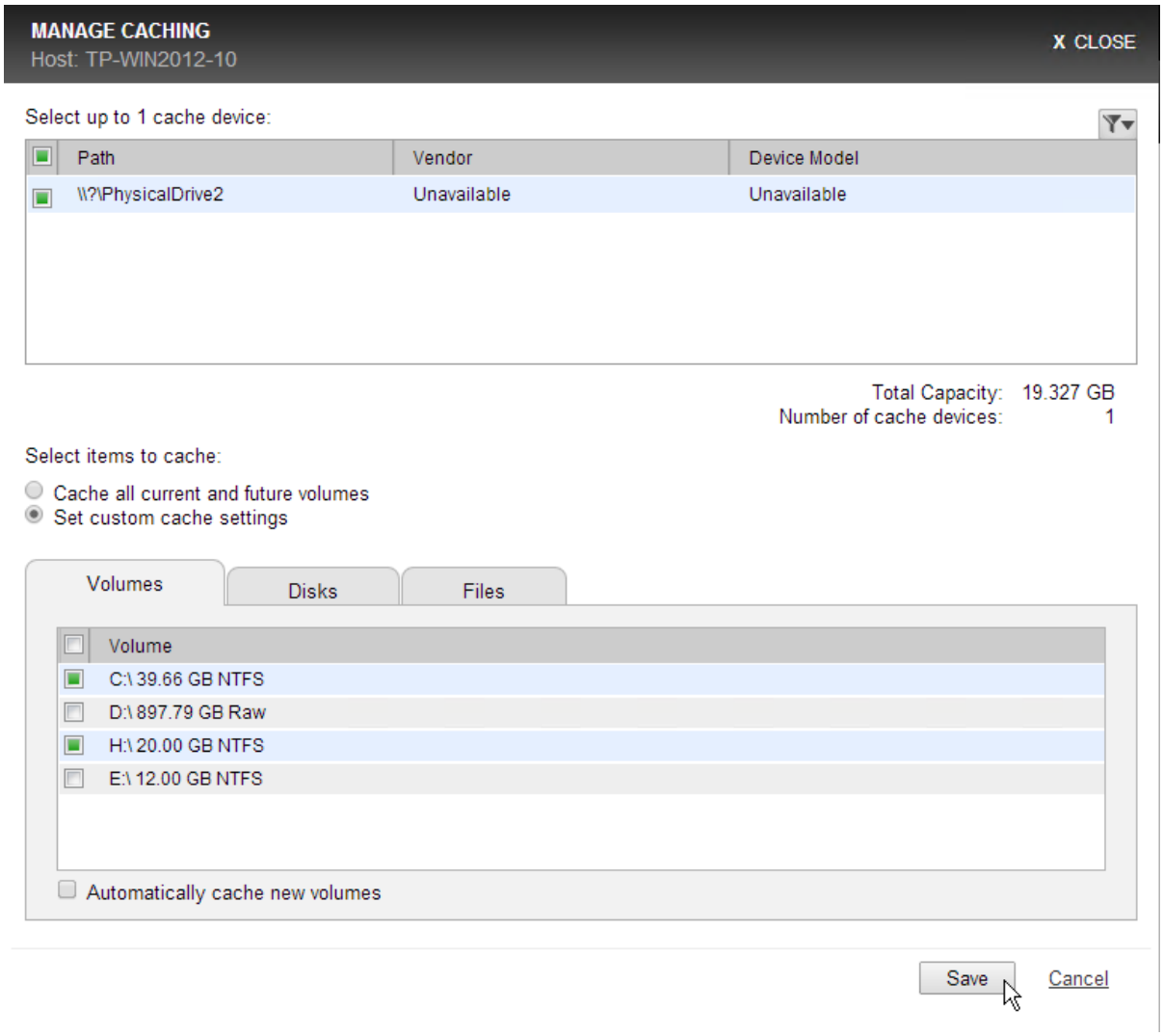
9. If you want to cache all the eligible volumes on the system (the default configuration), click **Cache all current and future volumes** and skip to step 13.
10. If you want to cache specific volumes, disks, or files, click **Set custom cache settings**.
11. From the Caching Selection drop down click **Custom**.
12. Click on the Volumes, Disks, or Files tab and then click on the objects you want to cache.



13. Click **Save**.

    A confirmation screen may display telling you that caching device will be formatted and all the data currently on the device will be permanently lost.

14. If asked, click **Confirm.**

The caching device is formatted, the volumes, disks, or files are configured for caching, and caching begins.

Example setup with CLI

The following procedure is an example of how you might configure IBM FlashCache Storage Accelerator to cache a file system on windows machine using the command line interface (CLI)..

Attention!

In command-line utility examples, text highlighted in blue indicate areas to take note of either before or after a command is executed.

1. Login in to the Windows machine.
2. Open a command window.
3. From the command line, type **`iottool status`**

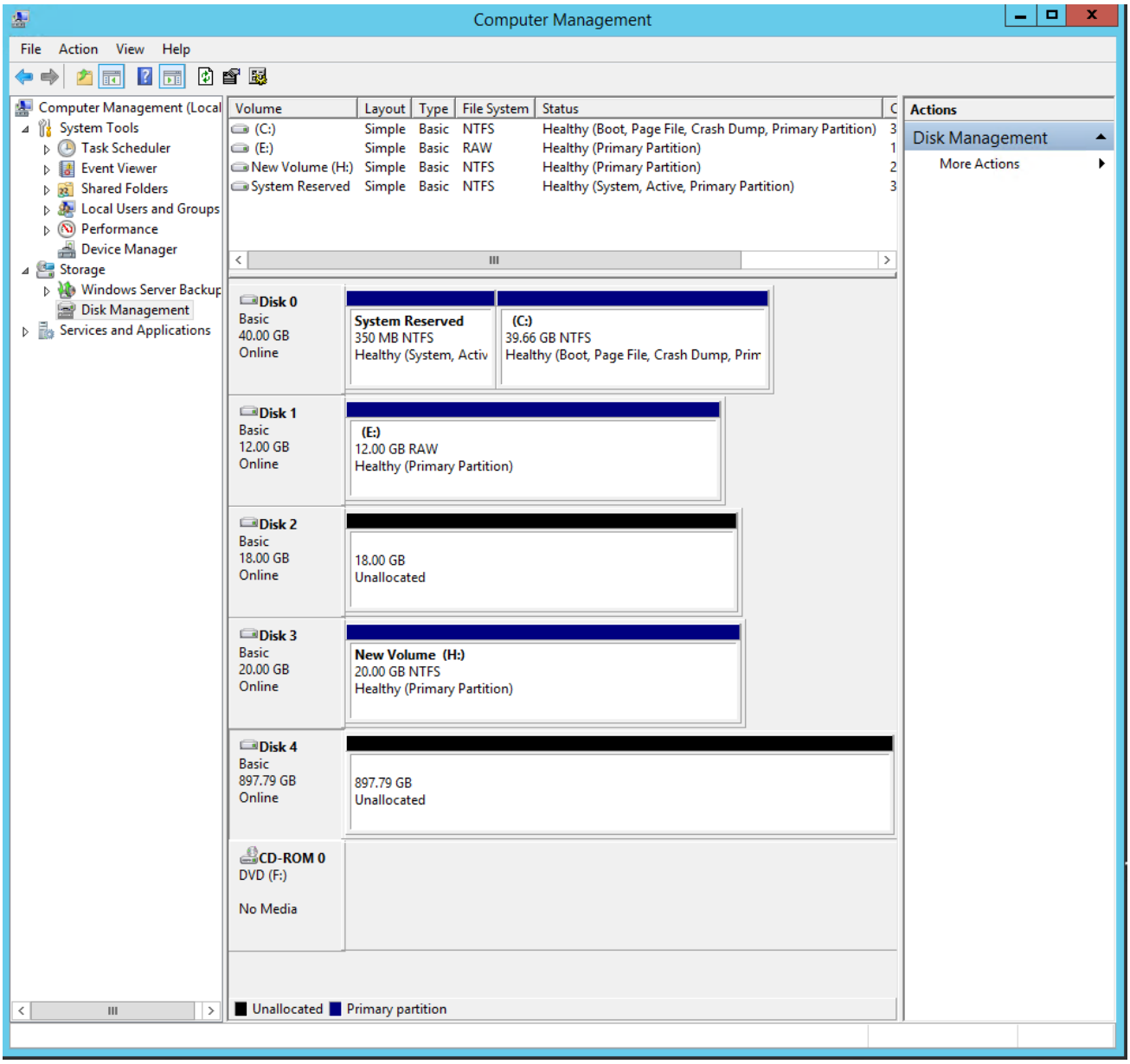
Attention!

Note: iottool commands by default operate in volume mode (**`/v`**). If you want them to run in disk mode use the **`/d`** option, and If you want them to run in file mode use the **`/f`** option

If IBM FlashCache Storage Accelerator for Windows has been installed correctly, the current status of caching on the machine displays.

```
C:\Users\Administrator>iottool status
Volume filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
No devices currently selected for caching.
healthstatus: 0x4b
Health Status Message: Caching disabled, No primary device added
for caching, No caching device assigned, No caching capacity
available.
```

4. Determine the device you want to use for caching. When configuring caching it can be helpful to have Windows Disk Management screen open. Open Disk Management by clicking **Start > Administrative Tools > Computer Management > Disk Management**



If the device you want to use is online, and it does not contain a file system or a partition, you can specify it as a cache device using the disk number. In the example above, you could use Disk4 to specify the cache device.

If there is a partition on the disk, but it has not been formatted with a file system (i.e. it is RAW), you can specify it as the cache device using the drive letter. In the example above, you could use E: to specify the cache device.

5. In this example, the IBM High IOPS Adapter is disk 4, so set the cache device by typing **`iottool setcachedevice disk4`**

   Adding the **`/q`** option to this command will suppress the warning and prompt that the device

will be formatted.

6. From the command line, type **iottool status**

```
C:\Users\Administrator>iottool setcachedevice disk4
About to format \\.\PhysicalDrive4
WARNING: If you continue, you will lose all the data on this drive. Do you
want to proceed? [Y/N]:y

C:\Users\Administrator>iottool status

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 963951722496 (3591 chunks)
No devices currently selected for caching.
healthstatus: 0x2
Health Status Message: No primary device added for caching.
```

7. Set a primary volume you want to cache by typing **iottool addvol d:**

```
C:\Users\Administrator>iottool listallvolumes
E:\
D:\
F:\
C:\

C:\Users\Administrator>iottool addvol d:
Please ensure storage is not configured for MSCS clustering before adding
for caching. Continue [Y/n]?y

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
No file rules currently defined for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.
```

```
Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 182267674624 (679 chunks)
Cached Device List:
D:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
No devices currently selected for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.
```

8. Start volume caching by typing **iottool startcache**
9. Review the settings you've configured by typing **iottool /a status**

```
C:\Users\Administrator>iottool startcache


C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
No file rules currently defined for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
```

```
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 182267674624 (679 chunks)
Cached Device List:
D:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
No devices currently selected for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.
```

IBM FlashCache Storage Accelerator for Windows is now caching drive D: on the IBM High IOPS device (disk 4).

Collecting logs for support

You can collect system logs for support in one of two ways:

- Using IBM Flash Management Console
- Using the command line interface (CLI)

Collecting logs for support using IBM Flash Management Console

To collect log bundles for support::

3. Log in to the machine where IBM FlashCache Storage Accelerator is running.
4. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Acceleratorfor Windows.

5. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
6. Click the **Configuration** tab.
7. On the left side of the screen click **Hosts.**
8. In the Hostname column, click the name of your host.
9. On the host Configure tab, click **Collect System Logs**.

IBM Flash Management Console collects the logs and saves a `.tar.bz2` file of the logs to your browser's download directory.

Collecting logs for support using the CLI

The command for assembling an IBM FlashCache Storage Accelerator log bundle is entered in a command prompt on the Windows machine where IBM FlashCache Storage Accelerator is installed. The logs and reports are saved to the following `.cab` files:

- `fio-bugreport-<date>_••••••.cab`
- `IOTSupportn.cab`

To collect log bundles for support:

1. As an administrator, open a command prompt on the machine where IBM FlashCache Storage Accelerator for Windows is installed.
2. From the command prompt type

   `iottool supportsave`

   By default the logs are assembled into a .cab file which is placed in the IBM FlashCache Storage Accelerator install directory, which by default is "C:\Program Files\IBM\IBM FlashCache Storage Accelerator\." You can, however, specify a path where you want the .cab file placed by specifying the following command line option

[/o <full-file-name>]

where

full-file-name — is the full path and filename where you want the logs and statistics written.

Example output for the command is listed below.

```
C:\Users\Administrator>iottool supportsave
C:\Program Files\IBM\IBM FlashCache Storage Accelerator
Capturing File System Minifilter Information
Capturing FSUTIL FSINFO
Capturing FSUTIL FSINFO for drive C:\
Capturing FSUTIL FSINFO for drive D:\
Capturing FSUTIL FSINFO for drive E:\
Capturing FSUTIL FSINFO for drive F:\
Capturing FSUTIL FSINFO for drive G:\
Capturing FSUTIL FSINFO for drive H:\
Saving System event log
 Capturing registry settings
Capturing IOT Information
Capturing system information
Running fio-bugreport
Report output: fio-bugreport-20140516_192453.cab
Generating bug report.  Please wait, this may take awhile...
-------------------------------------------------------------
Gathering all Windows Event Logs...DONE
Gathering Fusion-io Windows Event Logs...DONE
Gathering System Information...DONE
Gathering installer logs...DONE
Running fio utilities...DONE
Compressing to CAB file...DONE
Bug report has successfully been created: fio-bugreport-20140516_
192453.cab
  Please attach this file to your support case.
  If you do not have an open support case for this issue, please open a
support
  case with a problem description and then attach this file to your new
case.
Capturing VDS Information
```

```
Making cab file from fltmc-filters.txt fltmc-instances.txt fltmc-
volumes.txt fsutil-drives.txt fsutil-fsinfo-C.txt fsuti
l-fsinfo-D.txt fsutil-fsinfo-E.txt fsutil-fsinfo-F.txt fsutil-fsinfo-G.txt
fsutil-fsinfo-H.txt reg-diskclass.txt reg-vol
class.txt reg-csvolclass.txt reg-volflt.txt reg-diskflt.txt reg-fsflt.txt
reg-scsiflt.txt iot-fsdsstats.txt iot-voldssta
ts.txt iot-diskdsstats.txt iot-allstatus.txt iot-shares.txt iot-stats.txt
ip-config.txt net-use.txt sc-query.txt driver-
query.txt process-query.txt session-query.txt vdsinfo.txt
System.Event.evtx
cab file index is 1
Compressing fltmc-filters.txt
Compressing fltmc-instances.txt
Compressing fltmc-volumes.txt
Compressing fsutil-drives.txt
Compressing fsutil-fsinfo-C.txt
Compressing fsutil-fsinfo-D.txt
Compressing fsutil-fsinfo-E.txt
Compressing fsutil-fsinfo-F.txt
Compressing fsutil-fsinfo-G.txt
Compressing fsutil-fsinfo-H.txt
Compressing reg-diskclass.txt
Compressing reg-volclass.txt
Compressing reg-csvolclass.txt
Compressing reg-volflt.txt
Compressing reg-diskflt.txt
Compressing reg-fsflt.txt
Compressing reg-scsiflt.txt
Compressing iot-fsdsstats.txt
Compressing iot-voldsstats.txt
Compressing iot-diskdsstats.txt
Compressing iot-allstatus.txt
Compressing iot-shares.txt
Compressing iot-stats.txt
Compressing ip-config.txt
Compressing net-use.txt
Compressing sc-query.txt
Compressing driver-query.txt
Compressing process-query.txt
Compressing session-query.txt
Compressing vdsinfo.txt
Compressing System.Event.evtx
The file "fltmc-filters.txt" (Size: 336) has been added to cabinet
"IOTSupport1.cab"
The file "fltmc-instances.txt" (Size: 968) has been added to cabinet
```

```
been added to cabinet "IOTSupport1.cab"
The file "reg-scsiflt.txt" (Size: 919) has been added to cabinet
"IOTSupport1.cab"
The file "iot-fsdsstats.txt" (Size: 468) has been added to cabinet
"IOTSupport1.cab"
The file "iot-voldsstats.txt" (Size: 640) has been added to cabinet
"IOTSupport1.cab"
The file "iot-diskdsstats.txt" (Size: 466) has been added to cabinet
"IOTSupport1.cab"
The file "iot-allstatus.txt" (Size: 1019) has been added to cabinet
"IOTSupport1.cab"
The file "iot-shares.txt" (Size: 86) has been added to cabinet
"IOTSupport1.cab"
The file "iot-stats.txt" (Size: 2678) has been added to cabinet
"IOTSupport1.cab"
The file "ip-config.txt" (Size: 4408) has been added to cabinet
"IOTSupport1.cab"
The file "net-use.txt" (Size: 297) has been added to cabinet
"IOTSupport1.cab"
The file "sc-query.txt" (Size: 75409) has been added to cabinet
"IOTSupport1.cab"
The file "driver-query.txt" (Size: 20870) has been added to cabinet
"IOTSupport1.cab"
The file "process-query.txt" (Size: 2161) has been added to cabinet
"IOTSupport1.cab"
The file "session-query.txt" (Size: 389) has been added to cabinet
"IOTSupport1.cab"
The file "vdsinfo.txt" (Size: 33215) has been added to cabinet
"IOTSupport1.cab"
The file "System.Event.evtx" (Size: 4263936) has been added to cabinet
"IOTSupport1.cab"
Estimated size: 0, Actual Size: 701079
The operation completed successfully.


C:\Users\Administrator>cd "c:\Program Files\IBM\IBM FlashCache Storage
Accelerator"

c:\Program Files\IBM\IBM FlashCache Storage Accelerator>dir *.cab
 Volume in drive C has no label.
 Volume Serial Number is DA6C-9CB6

 Directory of c:\Program Files\IBM\IBM FlashCache Storage Accelerator

05/16/2014  01:26 PM           297,096 fio-bugreport-20140516_192453.cab
05/16/2014  01:26 PM           701,079 IOTSupport1.cab
               2 File(s)        998,175 bytes
               0 Dir(s)  214,625,951,744 bytes free
```

Using IBM Flash Management Console

All of the functionality and commands of IBM FlashCache Storage Accelerator can be accessed using the command line interface. Alternately, you can use the GUI interface from within the IBM Flash Management Console to manage and maintain your IBM FlashCache Storage Accelerator caching.

> **Attention!**
>
> Some CLI commands will not have equivalent GUI access.

For detailed instructions on how to install IBM Flash Management Console, see the *IBM Flash Management Console Installation Guide*.

IBM Flash Management Console is where you can easily manage IBM High IOPS Storage Devices and Enterprise Value Flash Adapters across multiple servers throughout a data center. For details and instructions for using all the IBM Flash Management Console controls and functionality, see the *IBM Flash Management Console User Guide*.

Logging in to the IBM Flash Management Console

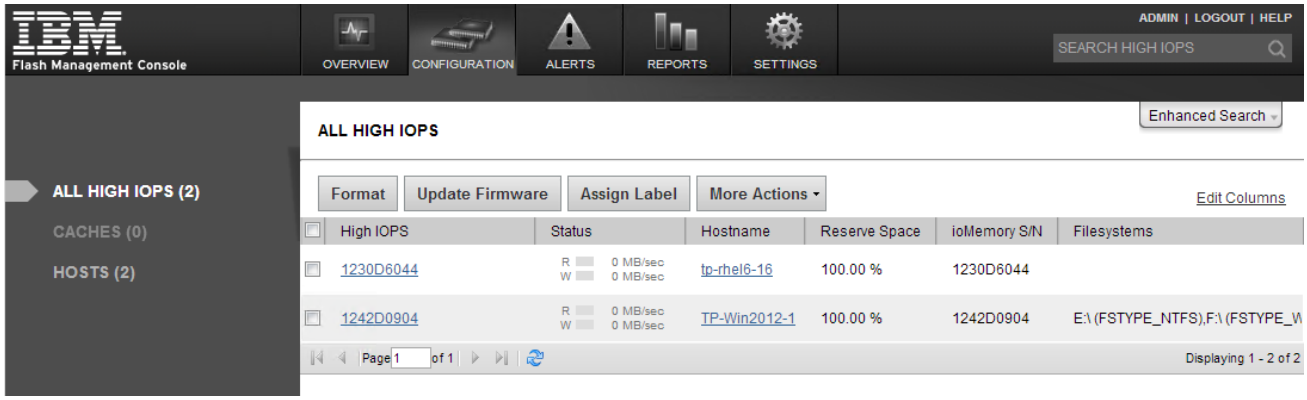
To access the IBM Flash Management Console interface:

1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

   hostname is the name or IP address of the server where the IBM Flash Management Console is installed.

3. Log in in the IBM Flash Management Console as user *admin*. (The password for *admin* was configured during installation.)
4. Click the **Configuration** tab.



Licensing IBM FlashCache Storage Accelerator

IBM FlashCache Storage Accelerator has three types of licenses:

- Built in Evaluation License
- Extended Evaluation License (short term, timed)
- Production License (timed or permanent)

> **Attention!**
>
> License files from IBM FlashCache Storage Accelerator 2.1.3 are not valid with IBM FlashCache Storage Accelerator 2.2.0. IBM Flash Management Console and the `iottool installlicense` command will reject earlier versions of IBM FlashCache Storage Accelerator license files.

Initially, you can use the built-in evaluation license which is valid for 120 days from the date of install. A warning alert will be generated two weeks, and then again one week, before licensing becomes out of compliance. After licensing is out of compliance, an error alert will be generated. After the evaluation period you will need to assign a license to your host using either the CLI or the IBM Flash Management Console user interface.

Multiple license files can be uploaded to IBM Flash Management Console which will manage the distribution of the licenses to any hosts whose agents are authenticated to IBM Flash Management Console. When a cache device is selected,IBM Flash Management Console moves a license to that host. If an undeployed license is not available in IBM Flash Management Console, the IBM Flash Management Console will query all known agents to see if any licensed hosts have unconfigured caching (i.e. no cache device is set). If it finds a licensed, but unconfigured, host, it will move the license from that host to the host that is requesting a license. If IBM Flash Management Console does not have any licenses and there are no unconfigured licensed hosts, then the licensing request will fail.

Because direct licenses are host-based, a single direct license file will only have one license count, and may be applied to only one host.

For details on using the CLI to license IBM FlashCache Storage Accelerator see the CLI command installlicense.

Licensing with IBM Flash Management Console

IBM FlashCache Storage Accelerator uses node-based licensing. That is, a single license is assigned to each host either through a CLI command or through the IBM Flash Management Console interface comes with an evaluation license that is valid for 90 days from the date the product is installed.

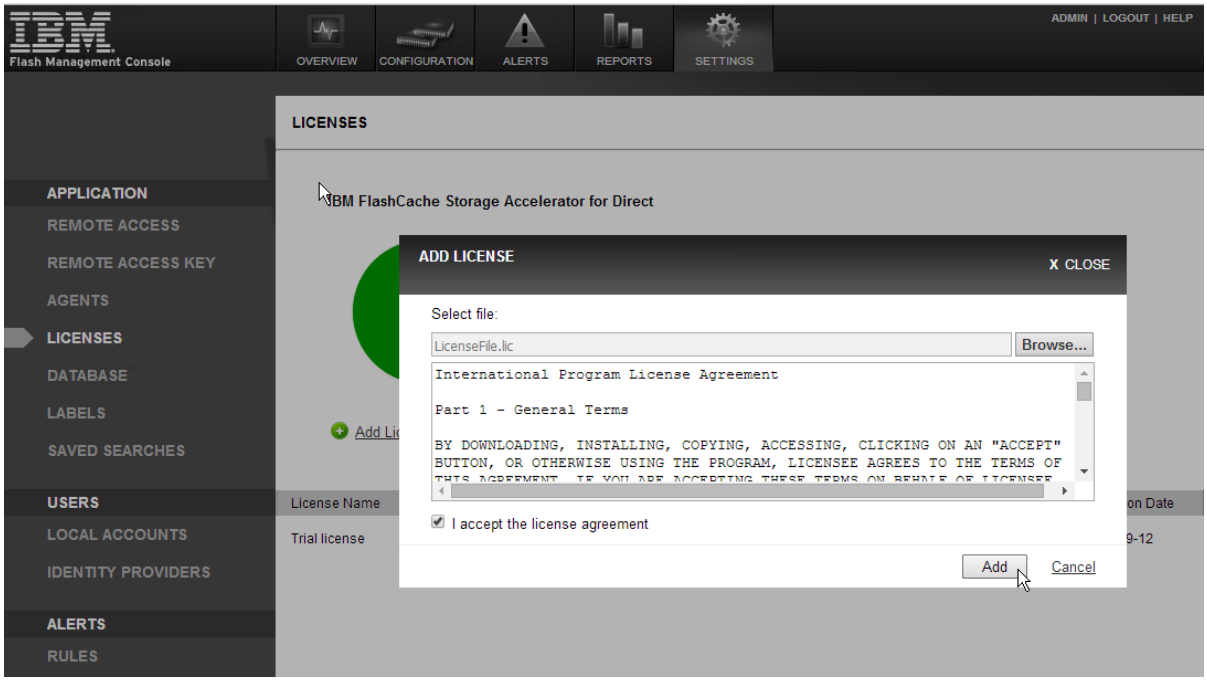
To license IBM FlashCache Storage Accelerator software:

1. Log in to IBM Flash Management Console.
2. Click the **Settings** tab.
3. On the left side of the screen click **Licenses**.
4. Click **Add License**

   Browse to the location of the license file and select it

5. Read the license agreement and then click the check box to accept it.
6. Click **Add**.

The license is added.



Licensing with the CLI

You can use the `iottool installlicense` command to deploy a license on your host.

About License Expiration

The following alerts are generated with regard to expiring licenses:

- A warning two weeks before licensing goes out of compliance
- A different warning one week before licensing goes out of compliance
- An “out of compliance” warning when licensing goes out of compliance

License-specific warnings are also displayed in the IBM Flash Management Console license grid next to license that are about to expire.

After your license expires, if IBM Flash Management Console has (or can find) an available license, it will move it to the host. However, until a new license is applied, IBM FlashCache Storage Accelerator will generate alerts telling you that your host is out of compliance. Out of compliance hosts continue to cache as long as a caching device remains configured and caching remains enabled.

Removing the last cache device or disabling caching on a host that is out of compliance will result in a licensing error when attempting to reconfigure or re-enable caching. The host will need to be re-licensed before caching can be re-configured.

Managing caching

To manage caching:

1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **Hosts.**
6. In the Hostname column, click the name of your host.
7. On the host Configure tab, click **Manage Caching**.

The Manage Caching dialog displays, and using this screen you can set a caching device.

To set a cache device:

1. From the Manage Caching dialog, click the device you want to use for caching.
2. Click either **Cache all current and future volumes** or **Set custom cache settings**.
3. If you select custom cache settings, click the objects you want to cache. (For more details see Custom cache settings).
4. Click **Save**.
5. Click **Confirm**.

The caching device is set. After a caching device is selected, you can monitor the status of the device and edit its configuration from the Caches link on the left side of the Configuration tab screen.

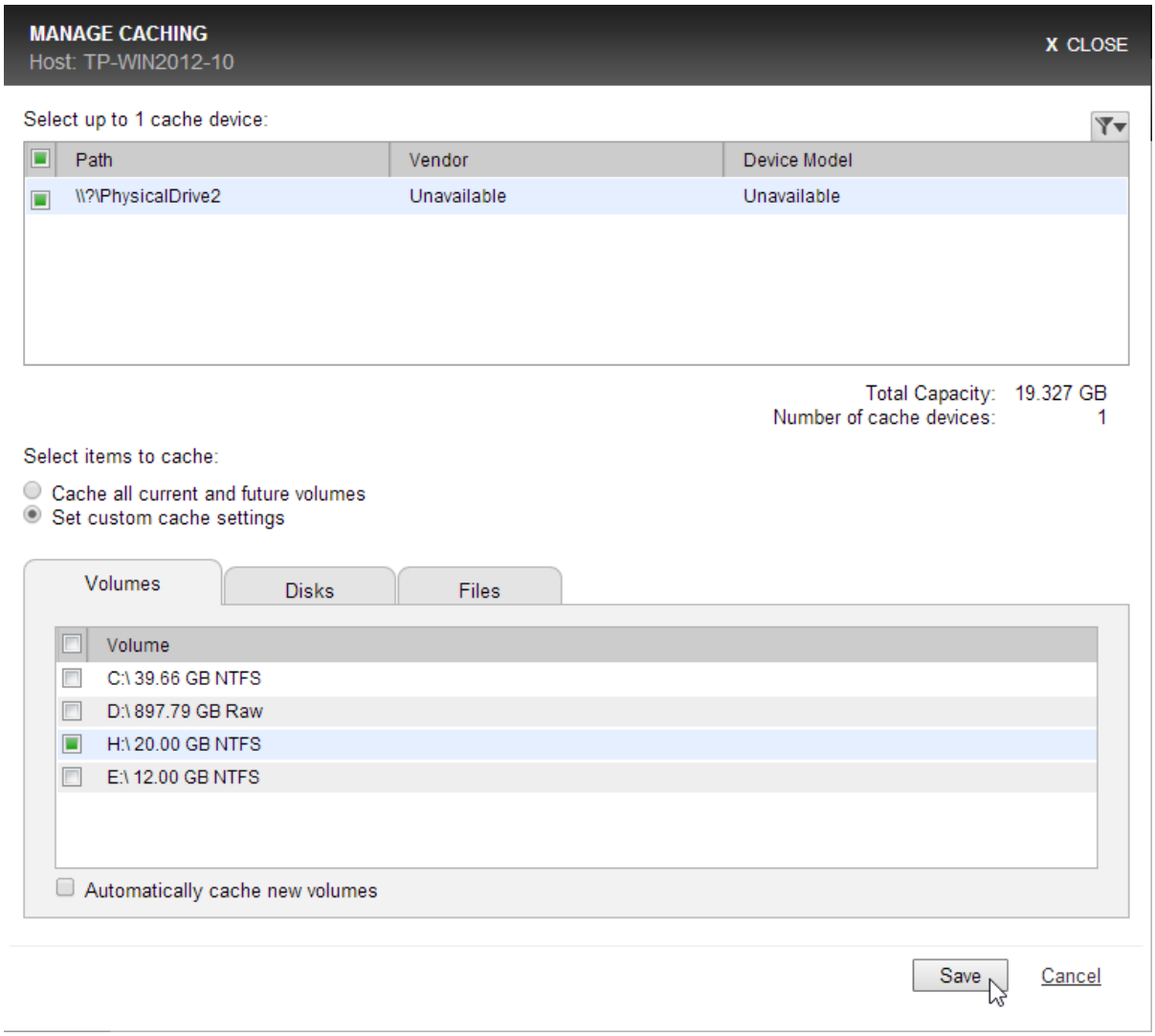
Custom cache settings

After a caching device is set, you can click **Set custom cache settings**. Clicking **Set custom cache settings** on the Manage Caching dialog displays the **Caching Selection** drop-down. The default selection is **Cache all current and future volumes**, meaning all eligible volumes on the machine are cached. However, choosing Custom gives you the option of selecting specific volumes to cache.

If you want to cache new volumes that may be created on the machine, click **Automatically cache new volumes**.

Attention!

Caching is only enabled on volumes that currently exist. If you add volumes later, caching will need to be enabled manually on those volumes.


MANAGE CACHING
Host: TP-WIN2012-10
X CLOSE
Select up to 1 cache device:
Path
Vendor
Device Model
\\?\PhysicalDrive2
Unavailable
Unavailable
Total Capacity: 19.327 GB
Number of cache devices: 1
Select items to cache:
Cache all current and future volumes
Set custom cache settings
Volumes
Disks
Files
Volume
C:\ 39.66 GB NTFS
D:\ 897.79 GB Raw
H:\ 20.00 GB NTFS
E:\ 12.00 GB NTFS
Automatically cache new volumes
Save
Cancel

Stopping, or disabling, caching

In the IBM FlashCache Storage Accelerator context, disabling caching is synonymous with stopping caching. That is, when you disable caching you temporarily stop caching on a primary but you do not remove the cache or delete your configuration.

To stop or temporarily disable caching:

1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

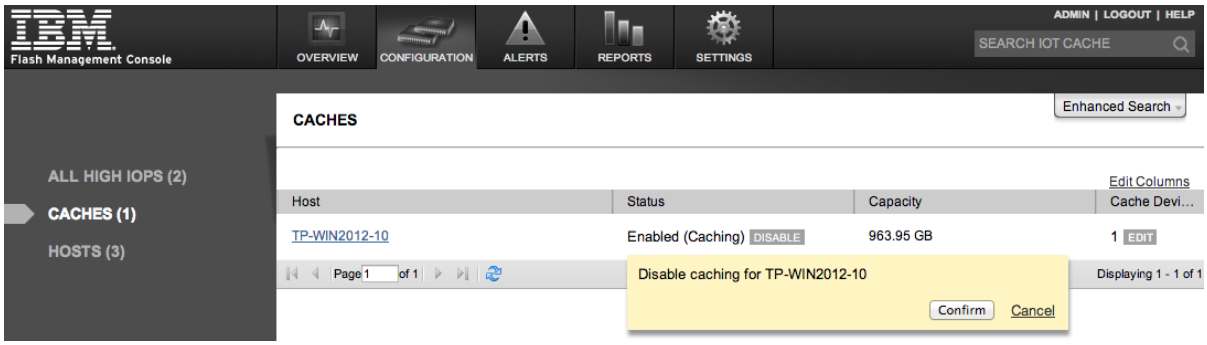
   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **Caches.**
6. In the Caches window, click **Disable** in the Status column.
7. Click **Confirm**.

Caching is stopped or disabled.

To restart caching, perform the same steps, but in step 6 click **Enable**.



Changing caching priority

IBM FlashCache Storage Accelerator for Windows has the ability to allocate caching IOPS across the volume, disk, and file filters.

To change caching priority:

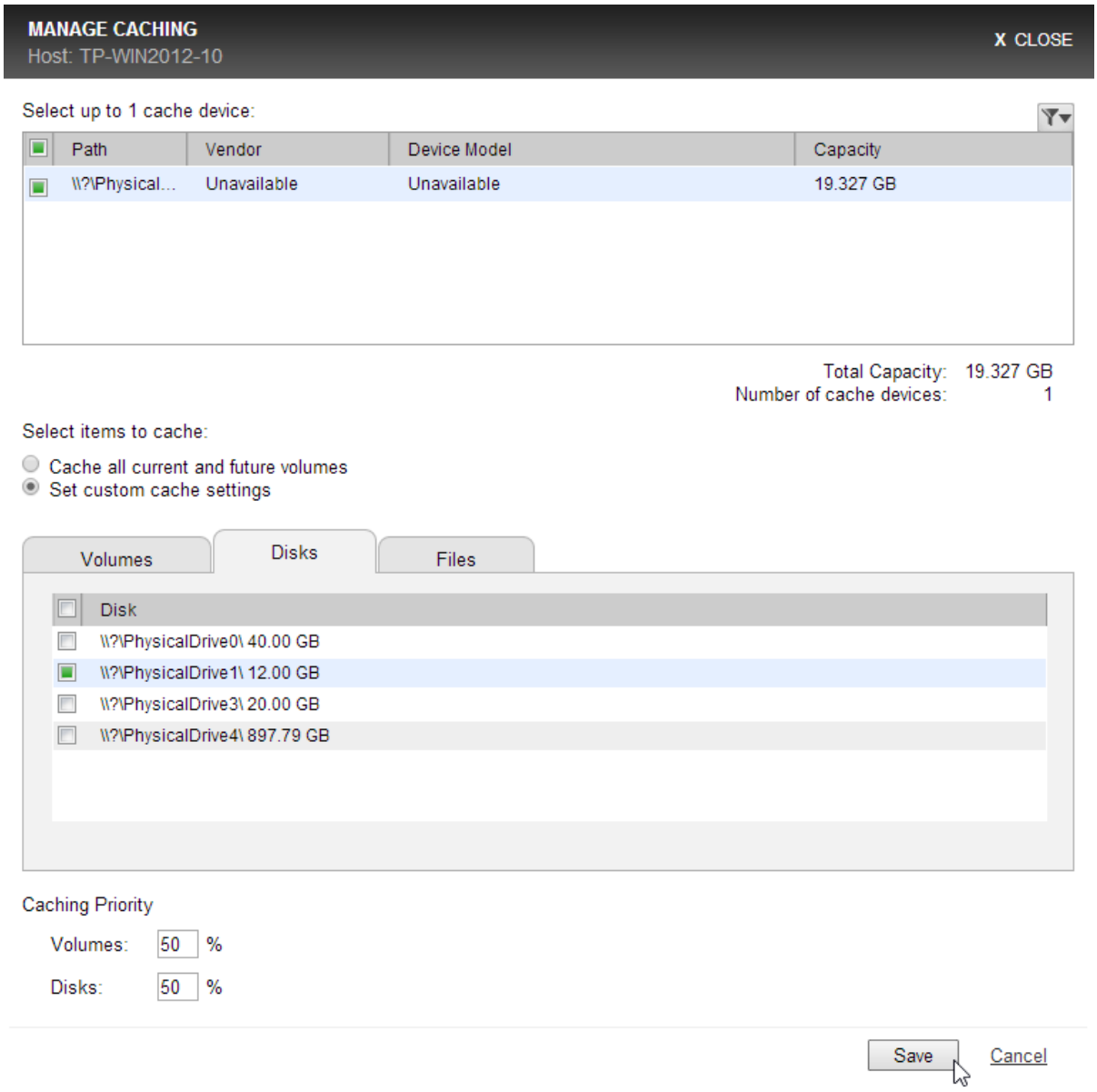
1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **Caches.**
6. In the Cache Devices column click **Edit**.
7. From the Manage Caching dialog, click **Set custom cache settings**.

If you have configured IBM FlashCache Storage Accelerator for Windows to use more than one caching filter, you will see, at the bottom of the Manage Caching dialog, the Caching Priority section where you can manually allocate caching IOPS to each filter in use. The sum of your percentages needs to equal 100%.


MANAGE CACHING
Host: TP-WIN2012-10
X CLOSE
Select up to 1 cache device:
Path
Vendor
Device Model
Capacity
\\?\Physical...
Unavailable
Unavailable
19.327 GB
Total Capacity: 19.327 GB
Number of cache devices: 1
Select items to cache:
Cache all current and future volumes
Set custom cache settings
Volumes
Disks
Files
Disk
\\?\PhysicalDrive0\ 40.00 GB
\\?\PhysicalDrive1\ 12.00 GB
\\?\PhysicalDrive3\ 20.00 GB
\\?\PhysicalDrive4\ 897.79 GB
Caching Priority
Volumes: 50 %
Disks: 50 %
Save
Cancel

Changing caching selection

To change the volumes, disks, or files that are being cached:

1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

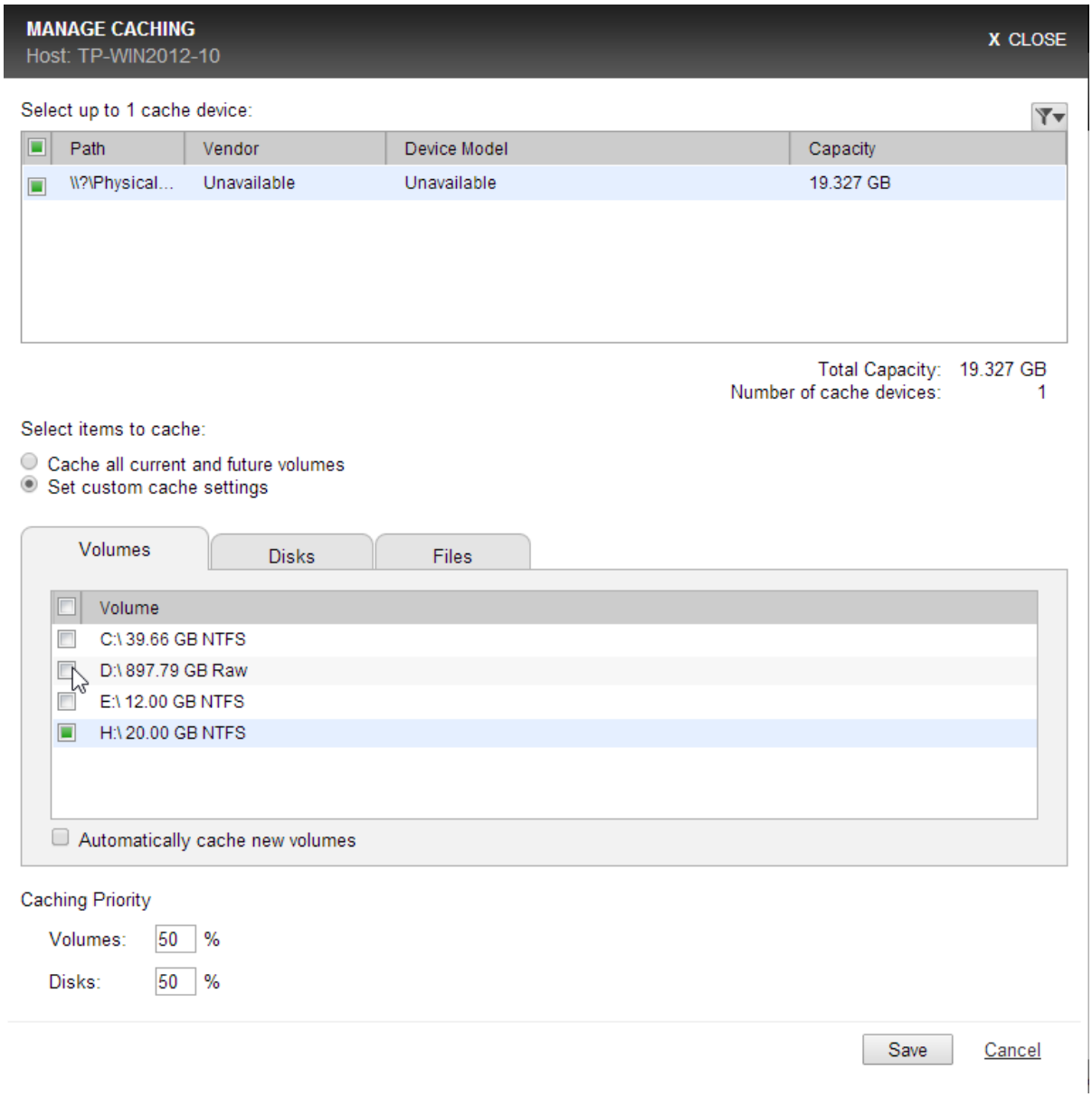
   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **Caches.**
6. In the Cache Devices column click **Edit**.
7. From the Manage Caching dialog, click **Set custom cache settings**.
8. Click the objects you want cached.

Three tabs display on the screen that correspond to the volume, disk, and files caching filters. By clicking on each tab, you can make caching selections for those filters.

After you have finished making you caching selections, click **Save** and **Confirm**.


MANAGE CACHING
Host: TP-WIN2012-10
X CLOSE
Select up to 1 cache device:
Path
Vendor
Device Model
Capacity
\\?\Physical...
Unavailable
Unavailable
19.327 GB
Total Capacity: 19.327 GB
Number of cache devices: 1
Select items to cache:
Cache all current and future volumes
Set custom cache settings
Volumes
Disks
Files
Volume
C:\ 39.66 GB NTFS
D:\ 897.79 GB Raw
E:\ 12.00 GB NTFS
H:\ 20.00 GB NTFS
Automatically cache new volumes
Caching Priority
Volumes: 50 %
Disks: 50 %
Save
Cancel

Viewing Live performance graphs

Live Performance graphs display information about the IBM High IOPS Adapter in your host or about the cache running on your host.

> **Attention!**
>
> To view Live Performance graphs you will need to have Flash installed for your browser.

To view Live Performance graphs:

1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

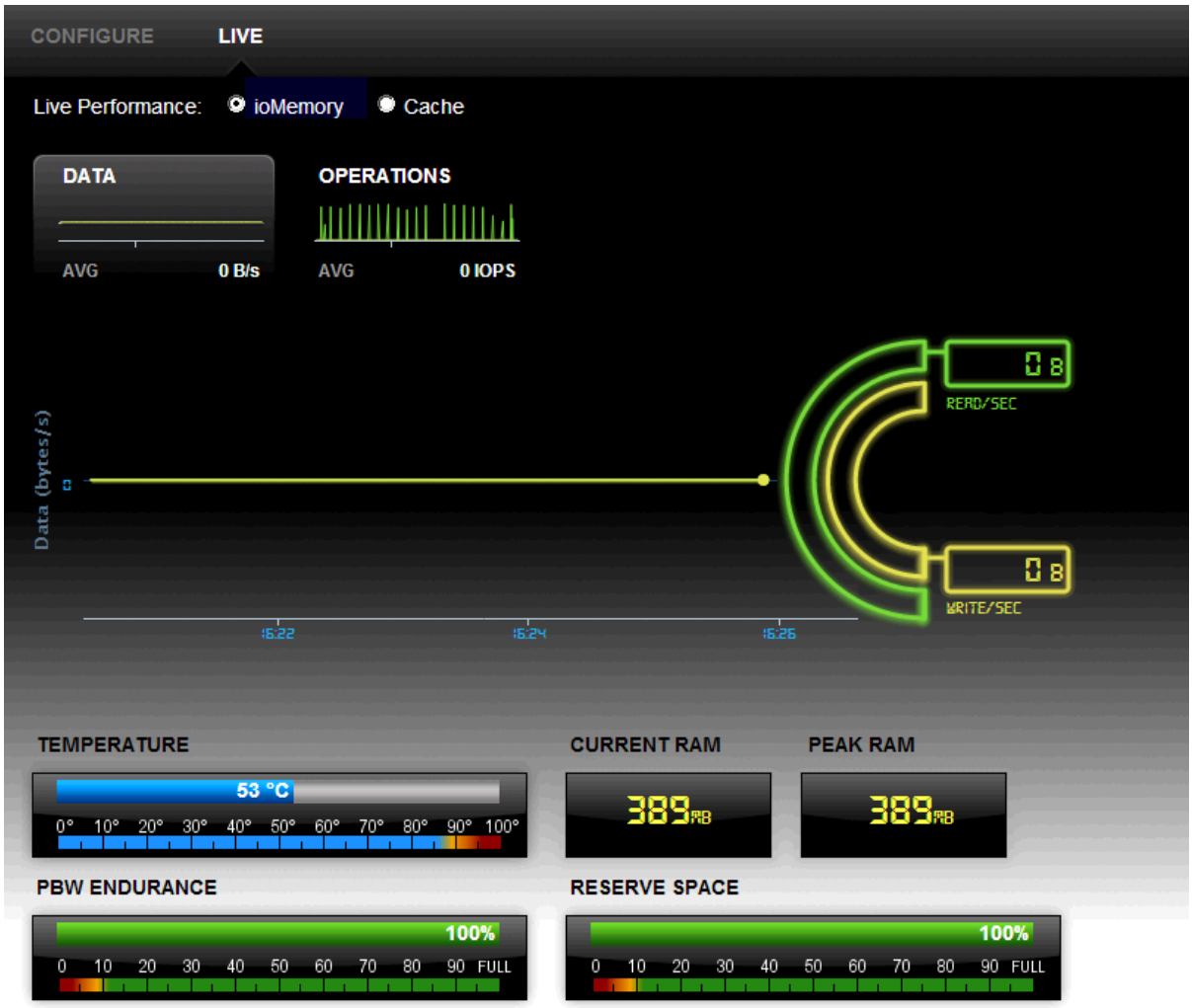
3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **Hosts.**
6. In the Hostname column, click the name of your host.
7. Click the **Live** tab.
8. From the Live tab click either **IBM High IOPS** or **Cache**.

The Live performance graphs display.

IBM High IOPS graphs

The following table describes the information displayed in the various graphs on the IBM High IOPS Live Peformance screen.

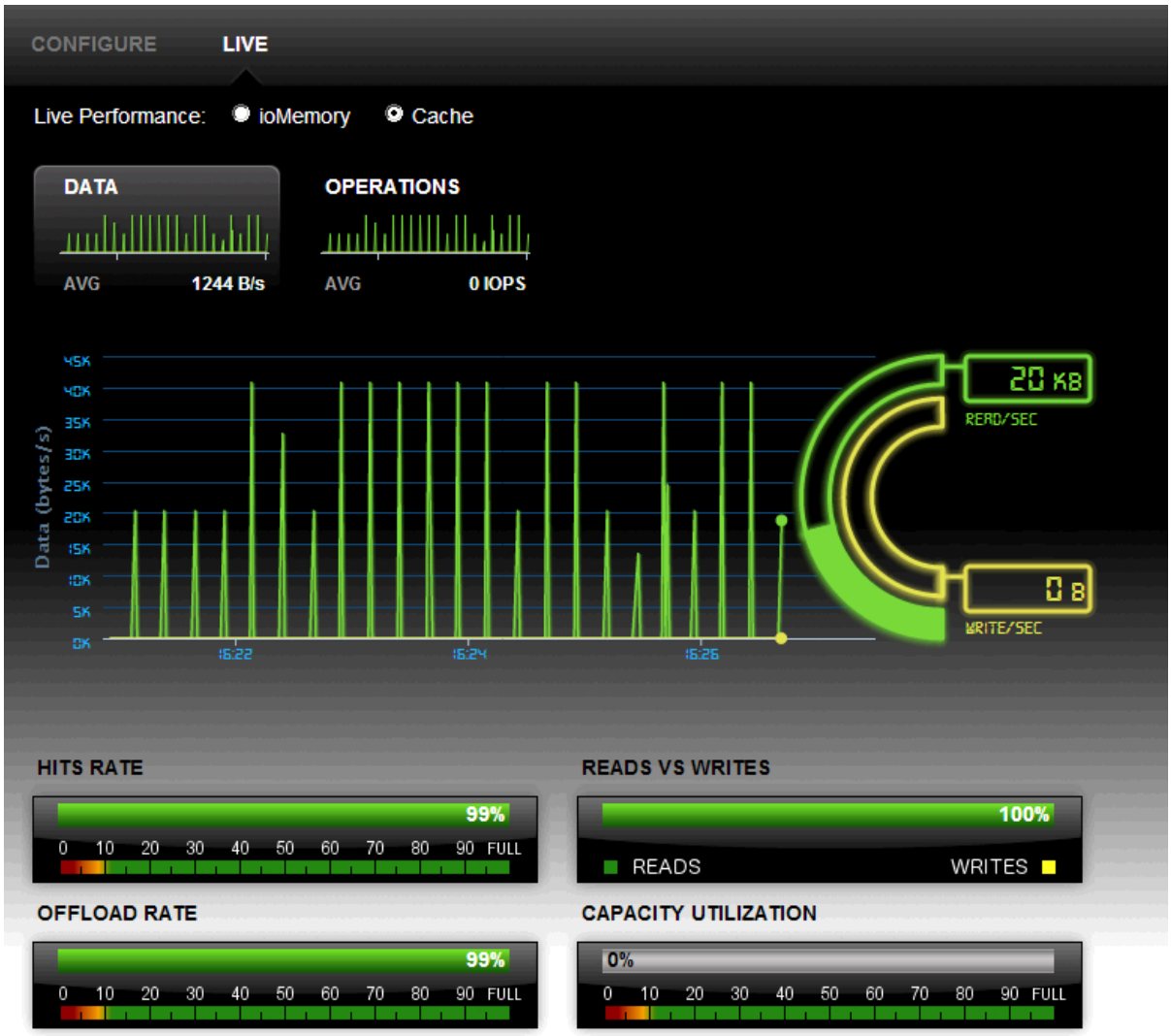
Item	Description
Data	A histogram of average megabytes per second being read or written to the Cache devices.
Operations	A histogram of average operations per second (shown in KIOPS) being performed on the Cache devices.
Combined Read/Write	Overlapping histograms of actual reads and writes to the Cache devices. The histogram is updated every second.
Temperature	The temperature of the FPGA on the IBM High IOPS device. Operating temperatures of devices vary, but throttling on older devices may occur after 78° C.
Current RAM	The current RAM being consumed on the host by IBM ioMemory VSL software.
Peak RAM	The peak amount of RAM that has been consumed since power on by IBM ioMemory VSL software.
PBW Performance	This value reflects the amount of wear experienced by the IBM High IOPS device. Values of 100% represent no wear on the device, or, that the device has 100% of its endurance left.
Reserve Space	As the IBM High IOPS device retires bad memory locations it moves the data at those bad locations to reserved space. This value reflects the amount of reserve space still available.


CONFIGURE
LIVE
Live Performance:
ioMemory
Cache
DATA
AVG
0 B/s
OPERATIONS
AVG
0 IOPS
Data (bytes/s)
0 B
READ/SEC
0 B
WRITE/SEC
15:22
15:24
15:26
TEMPERATURE
53 °C
0° 10° 20° 30° 40° 50° 60° 70° 80° 90° 100°
CURRENT RAM
389 MB
PEAK RAM
389 MB
PBW ENDURANCE
100%
0 10 20 30 40 50 60 70 80 90 FULL
RESERVE SPACE
100%
0 10 20 30 40 50 60 70 80 90 FULL

Cache graphs

The following table describes the information displayed in the various graphs on the Cache Live Peformance screen.

Item	Description
Data	A histogram of average megabytes per second being read or written to the Cache device.
Operations	A histogram of average operations per second (shown in KIOPS) being performed on the Cache device.
Combined Read/Write	Overlapping histograms of actual reads and writes to the Cache device. The histogram is updated every second.
Hits Rate	A bar chart showing a percentage of file IO that hits the Cache device.
Reads versus Writes	A bar chart showing the percentage of reads to writes on the Cache device. The two percentages equal 100%.
Offload Rate	A bar chart showing the offload rate. Offload rate can be calculated as: hits / (number of reads + number of writes)



Formatting an IBM High IOPS or Enterprise Value Flash device

If you are using an IBM High IOPS Adapter or Enterprise Value Flash Adapter with unchanged factory formatting, you do not need to re-format it. If necessary, IBM FlashCache Storage Accelerator will format the device for optimal caching settings when it is selected as a cache device. It is strongly recommended that you let IBM FlashCache Storage Accelerator re-format your IBM High IOPS Adapter.

If you are using an IBM High IOPS Adapter that has been formatted with 512-byte sectors to something other than original factory size, IBM FlashCache Storage Accelerator will not change the format. To use the device for caching it will need to have been formatted with 512-byte sectors, and it is strongly recommended that the device not be formatted to its maximum size to allow reserve space to improve the longevity and durability of the device. (Any device used for caching that does not use 512-byte sectors will be re-formatted with 512-byte sectors as this is required for IBM FlashCache Storage Accelerator cache devices.)

If you are using an SSD that is not an IBM High IOPS Adapter or Enterprise Value Flash Adapter or other approved IBM System X Flash device follow the manufacturer's instructions for properly formatting the device. IBM FlashCache Storage Accelerator will not use the SSD as a cache device if it is not formatted with 512-byte sectors.

To format an IBM High IOPS Adapter from the IBM Flash Management Console:

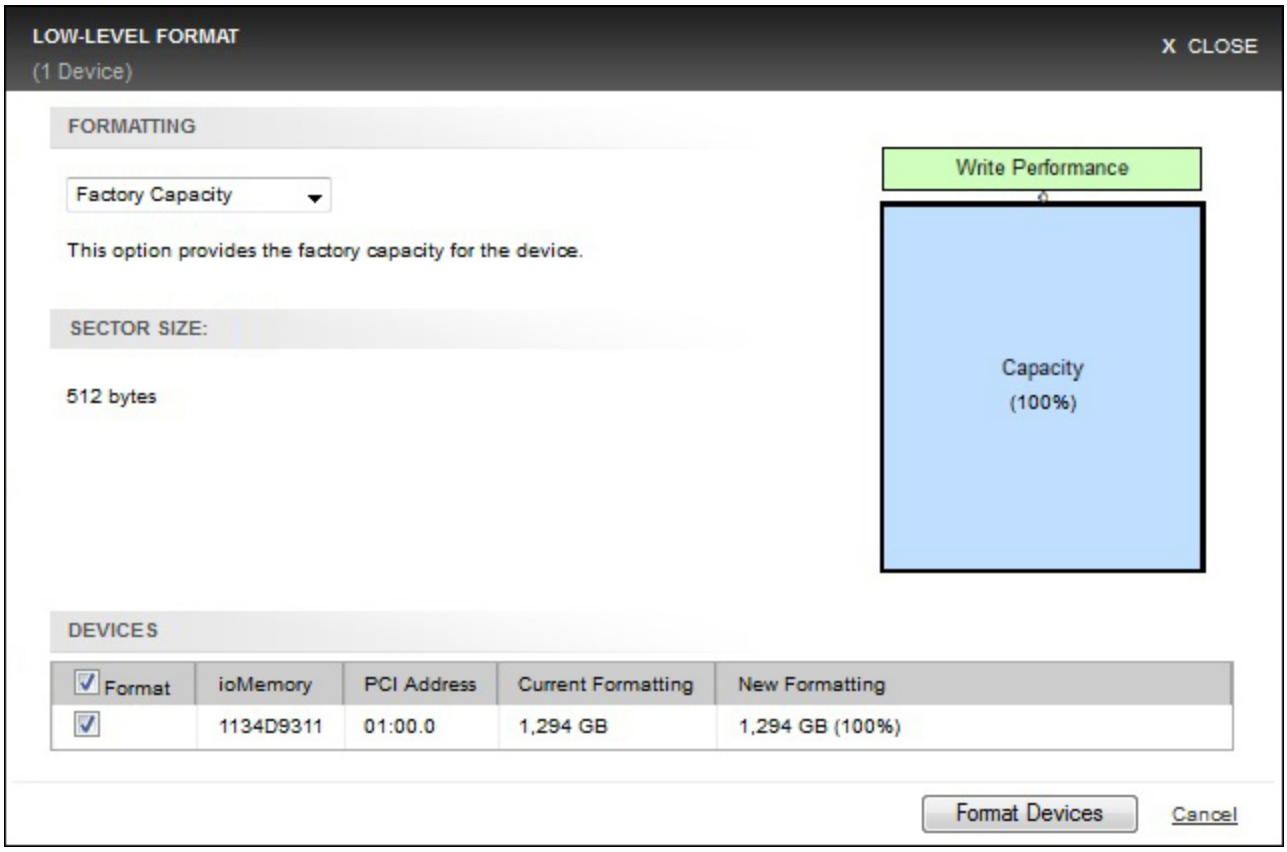
1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where
   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

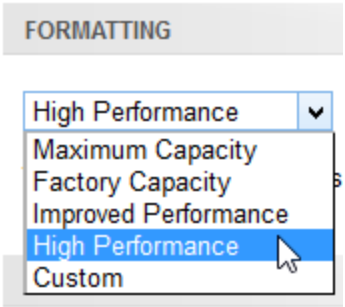
3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **IBM High IOPS**.
6. Click the check box next to the IBM High IOPS alias for your IBM High IOPS Adapter.
7. Click **Format**.

Attention!

Formatting a device will destroy any data still remaining on it. Please be sure to back up your data before proceeding.



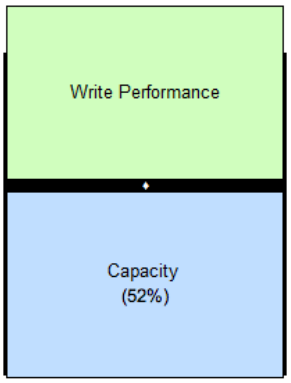
Here you can set the ratio of **Write Performance to Capacity.** You can increase Write Performance by decreasing the IBM High IOPS's capacity--the reverse is also true. You can select from a drop-down list of preset ratios (**Maximum Capacity, Factory Capacity, Improved Performance, High Performance).**



Attention!

For IBM FlashCache Storage Accelerator select "High Performance."

You can customize the Write ratio with the **Custom** selection (from the drop-down menu) or by dragging the line between **Write Performance and Capacity** in the graphic. You can also change the sector size by dragging the sizing bar in the **Write Performance** box.



The selected IBM High IOPS or Enterprise Value Flash Adapter device appears below the Write Performance/Capacity graphic. Check the corresponding checkbox to perform the desired action on the selected device or devices.

NOTE-

If an IBM High IOPS is unable to format (that is, it is busy or the formatting is not valid for that particular device), you will not be able to select it for formatting.

When you are ready to format the selected IBM High IOPS device, click the **Format Devices** button.

To exit the Low-Level Format dialog without formatting any devices, click, the **Cancel** link.

Updating firmware on an IBM High IOPS or Enterprise Value Flash device

To update firmware on an IBM High IOPS Adapter or Enterprise Value Flash Adapter from the IBM Flash Management Console:

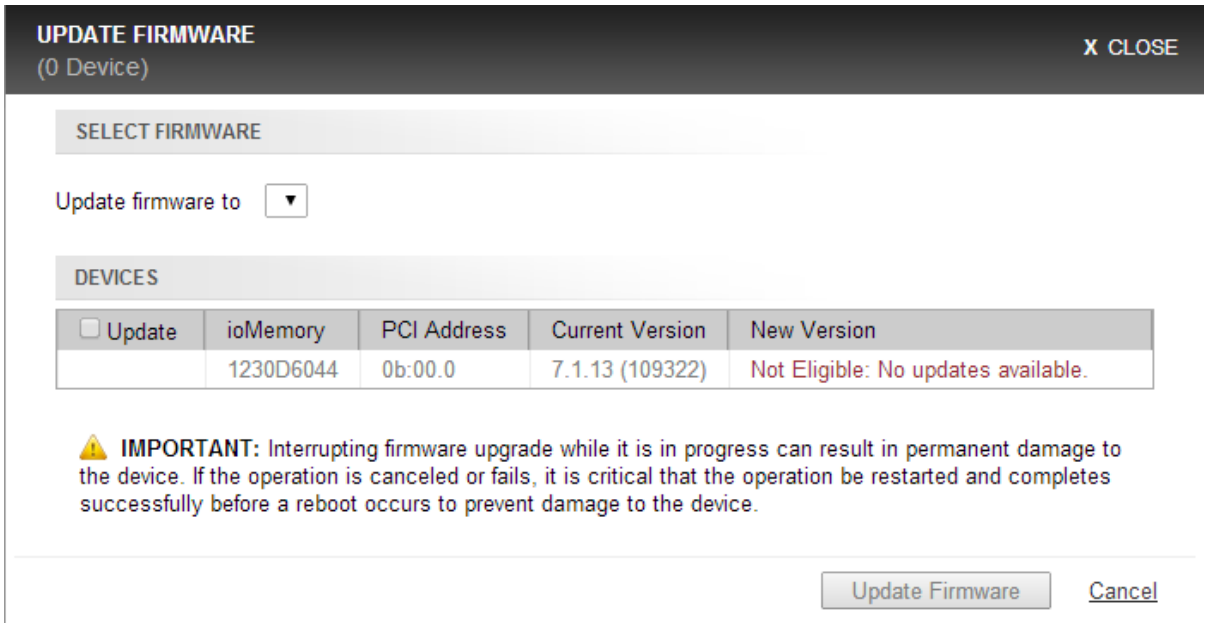
1. Log in to the machine where IBM FlashCache Storage Accelerator is running.
2. Open a browser and type the following on the address line: https://<hostname>:9051/index.html

   where

   hostname—is the host name of the machine where you want to configure IBM FlashCache Storage Accelerator for Windows.

3. Log in to IBM Flash Management Console as user *admin*. (The password for *admin* was configured during install.)
4. Click the **Configuration** tab.
5. On the left side of the screen click **IBM High IOPS**.
6. In the IBM High IOPS column, click the IBM High IOPS alias for your IBM High IOPS Adapter.
7. In the Firmware section, click **Update Firmware**.

From here you can select from the drop-down menu the version of the firmware you would like to install.



The selected IBM High IOPS device appears below the Update firmware drop-down menu. Check the corresponding checkbox to perform the desired action on the selected device or devices.

NOTE-

If an IBM High IOPS Adapter is unable to update (that is, it is busy or updates are not available for that particular device), the message "Not Eligible" displays in the New Version column of the

Devices table.

When you are ready to upgrade the selected IBM High IOPS's firmware, click the **Update Firmware** button. Or, to exit the **Update Firmware** dialog without updating any devices, click the **Cancel** link.

When the firmware update process begins, the **Config History** bar appears at the bottom of the screen.

Updating IBM High IOPS involves two procedures: updating IBM ioMemory VSL software on the host machine, and updating the firmware on the IBM High IOPS device.

Attention!

Before updating firmware, you must place the new firmware packages in the /scratch folder.

NOTE-

In most cases, if you upgrade the IBM High IOPS firmware, you must also upgrade the IBM High IOPS driver. Many support issues arise from mismatched firmware and drivers.

Upgrading the firmware may take some time. Monitor the progress using IBM FlashCache Storage Accelerator.

Attention!

Back up the data on your IBM High IOPS device prior to performing the upgrade.

Attention!

It is extremely important that the power not be turned off during a firmware upgrade, as this could cause device failure. If a UPS is not already in place, consider adding one to the system prior to performing a firmware upgrade.

Attention!

Interrupting an update while it is in progress can result in permanent damage to the device. Never kill the process. (For this same reason, the Agent process ignores all termination requests.) If the operation fails, it is critical that you restart this operation and complete it successfully before restarting the computer to prevent damage to the device.

iottool command reference

Options for the iottool command are provided below.

The following command line switches are common for many of the iottool commands:

- Use **/v, /f** and **/d** to specify volume, file and disk cache respectively. Commands that take switches default to **/v** if no switch is specified.
- Use **/a** to specify all cache filters.
- Use **/o** to specify output file.
- Use **/q** to enable non interactive mode. This means the command will not prompt for user input when it runs.

Attention!

In command line utility examples, text highlighted in blue indicate changes that you should take note of. This will help you readily focus on what the command did.

adddisk

This command adds the specified disk as a cache device.

iottool /d adddisk <diskxx> [diskyy diskzz ...]

/d — specifies that the command will operate on a disk (required).

diskxx — is a disk number to add. Multiple disks (separated by spaces) can be added with the same command.

```
C:\Windows\system32>iottool /d adddisk disk2
Please ensure storage is not configured for MSCS clustering before adding
for caching. Continue [Y/n]?y

C:\Windows\system32>iottool /d status

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0xd
Health Status Message: Caching disabled, No caching capacity available, No
caching shares allocated.
```

See also See deldisk on page 40.

addrule

This command will append the specified rule to the current rule list. You may enter rules on the command line or you can redirect the contents of a rule file to the addrule command.

The command can be issued in one of two forms:

iottool /f addrule <primaryRule>

> **primaryRule** — is a filename, directory name, or a folder name with extensions to be cached

iottool /f addrule @<rule-file-name>

> **rule-file-name** — is the name of a file that contains a list of rules to process.

In the rule file, you should specify only one rule per line.

> **Attention!**
> Adding rules singly on the command line is additive. However, when importing rules from a file all existing rules are first deleted and then the rules in the file are added.

Some examples of primary rules are:

- “F:\databases” -- which configures the files in the f:\databases directory for caching.
- “D:\SQL\Data\transaction.log” -- which configures the file transaction.log for caching.
- "F:\ DAT" -- which configures the files with a .dat extension that are at the root of drive F for caching.
- "C:\Program Files" .dll -- which adds all the .dll files in the Program Files directory.

> **Attention!**
> File names and paths need to be enclosed in quotation marks.

```
C:\Windows\system32>iottool /f addrule e:\databases
Rule {EABF3349-9BE9-4DC7-A635-F934A879F385} added successfully.

C:\Windows\system32>iottool /f addrule "e:\db\db.dat"
Rule {E71E9B78-8774-40F2-8812-AA012435A97E} added successfully.

C:\Windows\system32>iottool /f addrule "c:\program files\fileworker" .exe
Rule {BCA91394-7876-4491-9202-F7FCAD13469E} added successfully.

C:\Windows\system32>iottool /f listrules
{EABF3349-9BE9-4DC7-A635-F934A879F385}e:\databases\
{E71E9B78-8774-40F2-8812-AA012435A97E}e:\db\db.dat
{BCA91394-7876-4491-9202-F7FCAD13469E}c:\program files\fileworker\ .exe
```

```
E:\>iottool /f listrules

E:\>type cachingrules.txt
e:\databases
"e:\db\db.dat"
"c:\program files\fileworker" .exe

E:\>iottool /f addrule @cachingrules.txt
Rule {28546034-B3F7-4197-920D-0BECD768EFD6} added successfully.
Rule {8ACA1D7F-901F-40F3-A340-C72BEE17760D} added successfully.
Rule {E8880552-EE80-4BC2-A808-D629E46B3454} added successfully.

E:\>iottool /f listrules
{28546034-B3F7-4197-920D-0BECD768EFD6}e:\databases\
{8ACA1D7F-901F-40F3-A340-C72BEE17760D}e:\db\db.dat
{E8880552-EE80-4BC2-A808-D629E46B3454}c:\program files\fileworker\ .exe
```

See also See listrules on page 49, See delallrules on page 40.

addvol

This command will add the specified primary volume or list of volumes (separated by a space) to the list of volumes currently being cached.

iottool /v addvol <x:> [y: z: ...]

/v — specifies that the command will operate on a volume.

x: — is a drive letter to add. Multiple drive letters (separated by spaces) can be added with the same command.

```
C:\Users\Administrator>iottool listprimaryvolumes

C:\Users\Administrator>iottool /v addvol h:
Please ensure storage is not configured for MSCS clustering before adding
for caching. Continue [Y/n]?y

C:\Users\Administrator>iottool /v status

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 963951722496 (3591 chunks)
Cached Device List:
H:\
healthstatus: 0x0
Health Status Message: Caching working.
```

Attention!

IBM FlashCache Storage Accelerator can cache mounted volumes by specifying a backslash after the mount point name. For example, to cache a volume mounted in folder "J:\iSCSI_Mount", you would use the following command:

```
iottool addvol J:\iSCSI_Mount\
```

See also See delvol on page 41.

delallrules

This command will delete all the rules from the current rule list

iottool /f delallrules

```
C:\Windows\system32>iottool /f listrules
{EABF3349-9BE9-4DC7-A635-F934A879F385}e:\databases\
{E71E9B78-8774-40F2-8812-AA012435A97E}e:\db\db.dat
{BCA91394-7876-4491-9202-F7FCAD13469E}c:\program files\fileworker\ .exe

C:\Windows\system32>iottool /f delallrules

C:\Windows\system32>iottool /f listrules

C:\Windows\system32>
```

See also addrule, listrules.

deldisk

This command removes the specified primary disk from the list of disks being monitored.

iottool /d deldisk <diskxx> [diskyy diskzz ...]

/d — specifies that the command will operate on a disk (required).

diskxx — is a disk number to delete. Multiple disks (separated by spaces) can be deleted with the same command.

```
C:\Windows\system32>iottool /d status

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
```

```
Cache Size in use: 0 (0 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0xd
Health Status Message: Caching disabled, No caching capacity available, No
caching shares allocated.

C:\Windows\system32>iottool /d deldisk disk2
C:\Windows\system32>iottool /d status

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
No devices currently selected for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.
```

See also See adddisk on page 37.

delvol

This command will remove the specified primary volume (or volumes separated by a space) from the list of volumes being cached.

iottool /v delvol <x:> [y: z: ...]

/v — specifies that the command will operate on a volume.

x: — is a drive letter to delete. Multiple drive letters (separated by spaces) can be deleted with the same command.

```
C:\Users\Administrator>iottool listprimaryvolumes
H:\

C:\Users\Administrator>iottool /v delvol h:

C:\Users\Administrator>iottool listprimaryvolumes

C:\Users\Administrator>
```

See also See addvol on page 39.

diffstats

This command shows the difference between the stats data by the specified interval in seconds. The command continues to run until it's killed.

iottool [/v | /f | /d] diffstats <interval-to-repeat>

> **/v** — displays the volume caching stats. This is the default option if the command is run without a switch.
>
> **/f** — displays the file caching stats..
>
> **/d** — specifies the disk caching stats.
>
> **interval-to-repeat** — an interval in seconds that specifies how often to display stats.

Differences in the following stats are reported:

- hits — the number of read IOs serviced from cache
- hit Ratio — the percentage of read IOs serviced from cache
- misses — the number of read IOs serviced from primary
- miss Ratio — the percentage of read IOs serviced from primary
- Number of Reads — the number of reads from the cache.
- Cache Page Reads — the number of read IOs issued to the cache
- Number of Writes — the number of writes to the cache
- Cache Page Writes — the number of write IOs issued to the cache

```
C:\Transfer>iottool diffstats 3
hits: 0
hit Ratio: 0.00
misses: 0
miss Ratio: 0.00
Number of Reads: 0
Cache Page Reads: 0
Number of Writes: 0
Cache Page Writes: 0

hits: 0
hit Ratio: 0.00
misses: 333
miss Ratio: 100.00
Number of Reads: 37
Cache Page Reads: 333
Number of Writes: 41
Cache Page Writes: 325

hits: 1446
hit Ratio: 37.36
misses: 2424
miss Ratio: 62.64
```

```
Number of Reads: 430
Cache Page Reads: 3870
Number of Writes: 39
Cache Page Writes: 334

hits: 7094
hit Ratio: 99.99
misses: 1
miss Ratio: 0.01
Number of Reads: 791
Cache Page Reads: 7095
Number of Writes: 42
Cache Page Writes: 263

hits: 7317
hit Ratio: 99.99
misses: 1
miss Ratio: 0.01
Number of Reads: 814
Cache Page Reads: 7318
Number of Writes: 43
Cache Page Writes: 325
```

See also See stats on page 62.

disableautocache

This command disables auto cache on your machine, which will automatically disable caching on any new volumes created on the machine.The caching configuration of volumes currently running on the machine will not be affected by this command.

```
c:\>iottool getautocachestatus
Auto Cache Status: autocache enabled.

c:\>iottool disableautocache
c:\>iottool getautocachestatus
Auto Cache Status: autocache disabled.
```

disablereadupdate

This command allows you to disable read updates to the volume, file, or disk layer of your machine's read cache without invalidating the existing read cache.

For example, you might need to disable read updates on your machine before performing a backup to prevent infrequently accessed files from filling up your read cache.

```
c:\>iottool /a getcachingpolicy
FileFilter: Caching Policy: read updated enabled.
```

```
VolFilter: Caching Policy: read updated enabled.
DiskFilter: Caching Policy: read updated enabled.

c:\>iottool /v disablereadupdate

c:\>iottool /a getcachingpolicy
FileFilter: Caching Policy: read updated enabled.
VolFilter: Caching Policy: read updated disabled.
DiskFilter: Caching Policy: read updated enabled.
```

enableautocache

This command enables autocache on your machine, which will automatically enable caching on any new volumes created on the machine.The caching configuration of volumes currently running on the machine will not be affected by this command.

Attention!

This command does not affect the read cache for disks or files.

```
c:\>iottool getautocachestatus
Auto Cache Status: autocache disabled.

c:\>iottool enableautocache

c:\>iottool getautocachestatus
Auto Cache Status: autocache enabled.
```

enablereadupdate

This command allows you to disable read updates to a the volume, file, or disk layer of your machine's read cache without invalidating the existing read cache.

```
c:\>iottool /a getcachingpolicy
FileFilter: Caching Policy: read updated enabled.
VolFilter: Caching Policy: read updated disabled.
DiskFilter: Caching Policy: read updated enabled.

c:\>iottool /v enablereadupdate

c:\>iottool /a getcachingpolicy
FileFilter: Caching Policy: read updated enabled.
VolFilter: Caching Policy: read updated enabled.
DiskFilter: Caching Policy: read updated enabled.
```

getallshares

This command prints the current shares and assigned chunks for all the layers.

iottool getallshares

```
C:\Users\Administrator>iottool getallshares
File Shares: 0, Chunks: 0
Vol  Shares: 4000, Chunks: 4488
Disk Shares: 0, Chunks: 0
```

See also See getshares on page 47, See setshares on page 60, See setallshares on page 52.

getautocachestatus

This command displays the status of auto cache on your machine.

```
c:\>iottool disableautocache

c:\>iottool getautocachestatus
Auto Cache Status: autocache disabled.
```

getcachepagesize

This displays the current cache page size.

iottool [/v | /f | /d] getcachepagesize

/v — displays cachepagesize with the volume filter. This is the default option if the command is run without a switch.

/f — displays cachepagesize with the file filter.

/d — displays the cachepagesize with the disk filter.

The default cachepagesize is 16384 bytes. For more information on cachepagesize see setcachepagesize.

```
C:\Users\Administrator>iottool getcachepagesize
CachePageSize : 16384
```

See also setcachepagesize.

getcachesize

This displays the current cache size. Cache size for a specific filter will be dependent on how many shares have been allocated to it.

iottool [/v | /f | /d] getcachesize

/v — displays cachesize with the volume filter. This is the default option if the command is run without a switch.

/f — displays cachesize with the file filter.

/d — displays the cachesize with the disk filter.

By default cachesize is set to the maximum size of the caching device. For more information see setcachesize.

```
F:\>iottool getallshares
File Shares: 3300, Chunks: 1683
Vol  Shares: 3300, Chunks: 1870
Disk Shares: 2000, Chunks: 935

F:\>iottool /f getcachesize
CacheSize : 451776872448

F:\>iottool /v getcachesize
CacheSize : 501974302720

F:\>iottool /d getcachesize
CacheSize : 250987151360
```

See also setcachesize.

getcachingpolicy

This command displays the read update caching policy that is set for the volume, file, or disk layer of your machine's read cache.

```
c:\>iottool /a getcachingpolicy
FileFilter: Caching Policy: read updated enabled.
VolFilter: Caching Policy: read updated disabled.
DiskFilter: Caching Policy: read updated enabled.
```

getlicenseinfo

This command displays IBM FlashCache Storage Accelerator licensing information for your machine..

getmaxcachereadiosize

This displays the current maximum cache read size.

iottool [/v | /f | /d] getmaxcachereadiosize

/v — displays maxcachereadiosize with the volume filter. This is the default option if the command is run without a switch.

/f — displays maxcachereadiosize with the file filter.

/d — displays the maxcachereadiosize with the disk filter.

For more information on maxcachereadiosize see setmaxcachereadiosize.

```
C:\Users\Administrator>iottool getmaxcachereadiosize
MaxCacheReadIoSize : 1048576
```

See also setmaxcachereadiosize.

getmaxcachewriteiosize

This displays the current maximum cache write size.

iottool [/v | /f | /d] getmaxcachewriteiosize

/v — displays maxcachewriteiosize with the volume filter. This is the default option if the command is run without a switch.

/f — displays maxcachewriteiosize with the file filter.

/d — displays the maxcachewriteiosize with the disk filter.

For more information on maxcachewriteiosize see setmaxcachewriteiosize.

```
C:\Users\Administrator>iottool getmaxcachewriteiosize
MaxCacheWriteIoSize : 1048576
```

See also setmaxcachewriteiosize.

getmemlimit

Attention!

This command is only supported on 32-bit Windows 2003.

This command gets the maximum memory limit for IBM FlashCache Storage Accelerator.

For more information on memlimt see setmemlimit.

getshares

This command prints the current shares value for the specified layer.

iottool [/v | /f | /d] getshares

/v — specifies that the command will display volume caching shares. This is the default option if the command is run without a switch.

/f — specifies that the command will display file caching shares.

/d — specifies that the command will display disk caching shares.

```
C:\Users\Administrator>iottool /v getshares
Shares: 4000

C:\Users\Administrator>iottool /f getshares
Shares: 0

C:\Users\Administrator>iottool /d getshares
Shares: 0
```

See also See getallshares on page 45, See setshares on page 60, See setallshares on page 52.

installlicense

This command applies a license to the machine it is executed on. A license installed with this command will overwrite any existing license on the host. If the host's agent is connected to IBM Flash Management Console, IBM Flash Management Consolewill be notified that the host is now licensed.

Although an existing license will be overwritten by this command, the license file that was used to configure the IBM FlashCache Storage Accelerator driver will still be in place in its original location unless it has been manually deleted.

The command takes the name of the license file (with any necessary path information) as a required option:

iottool installlicense <licenseFile>

licenseFile — is the name of the license file. Path or file names that contain spaces need to be included in quotation marks.

```
C:\Transfer\licenses>iottool installlicense ioTurbine_Direct_FCS_TEST_
CUSTOMER_Exp2017.lic

C:\Transfer\licenses>iottool getlicenseinfo
license_sn::FCS_TESTCUSTOMER_ioTurbineDirect_001
license_product::ioTurbine-Direct
license_description::ioTurbine-Direct Ver 2
license_type::PRODUCTION
license_expires::2017-apr-8
```

listprimaryvolumes

This command shows the list of primary volumes being monitored currently by the driver.

iottool listprimaryvolumes

```
C:\Users\Administrator>iottool listprimaryvolumes
C:\
H:\
```

See also See addrule on page 38, See delvol on page 41.

listallvolumes

This command will list all the volumes in the system, except for removable CDROM and RAMDISK types.

iottool listallvolumes

```
C:\Users\Administrator>iottool listallvolumes
G:\
C:\
```

See also See listprimaryvolumes on page 48.

listrules

This command lists the rules in the order the driver is currently processing them.

iottool /f listrules

```
C:\Users\Administrator>iottool /f listrules
{28546034-B3F7-4197-920D-0BECD768EFD6}e:\databases\
{8ACA1D7F-901F-40F3-A340-C72BEE17760D}e:\db\db.dat
{E8880552-EE80-4BC2-A808-D629E46B3454}c:\program files\fileworker\ .exe
```

See also addrule.

resetcachedevice

This command resets the MBR on any disk that was set up by the setcachedevice command. It can only be used if the cache is stopped.

Attention!

If the cache device on the host is removed, the host remains licensed until the `iottool uninstalllicense` command is run or until IBM Flash Management Console removes the license to give it to a different host.

```
C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
```

```
Cache Size in use: 120795955200 (450 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
healthstatus: 0x1
Health Status Message: Caching disabled.

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 281857228800 (1050 chunks)
Cached Device List:
H:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 561298538496 (2091 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x1
Health Status Message: Caching disabled.

C:\Users\Administrator>iottool /v stopcache

C:\Users\Administrator>iottool resetcachedevice

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
```

```
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

Volume filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
H:\
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.
```

See also See setcachedevice on page 53.

resetstats

This resests the stats maintained by the caching file system (CFS) for the specified layer.

iottool [/a | /v | /f | /d] resetstats

/a — resets stats for all layers: volumes, disks, and files.

/v — shows caching stats on volumes. This is the default option if the command is run without a switch.

/f — shows caching stats on files.

/d — shows caching stats on disks.

```
C:\Users\Administrator>iottool stats
hits: 16942
hit Ratio: 95.89
misses: 726
```

```
miss Ratio: 4.11
Number of Reads: 17248
Cache Page Reads: 17668
Number of Writes: 23306
Cache Page Writes: 29806

C:\Users\Administrator>iottool resetstats

C:\Users\Administrator>iottool stats
hits: 40
hit Ratio: 100.00
misses: 0
miss Ratio: 0.00
Number of Reads: 40
Cache Page Reads: 40
Number of Writes: 26
Cache Page Writes: 28
```

See also stats, diffstats.

setallshares

This command sets the shares for all three layers.

iottool setallshares <file-shares | volume-shares | disk-shares>

file-shares — specifies the number of shares for file caching

volume-shares — specifies the number of shares for volume caching.

disk-shares — specifies that the number of shares for disk caching.

Attention!

This command will stop cache on all filters, update shares, and start caching for all filters again.

The example below illustrates the relationship between share allocation and filter cache size. The shares allocated below for file, volume, and disk caching are roughly 13%, 29%, and 58%. The amount of cache available for each filter is divided up accordingly.

```
C:\Users\Administrator>iottool getallshares
File Shares: 0, Chunks: 0
Vol  Shares: 3591, Chunks: 3591
Disk Shares: 0, Chunks: 0

C:\Users\Administrator>iottool setallshares 500 1000 2091
Setting shares: file: 500, volume: 1000, disk: 2091

C:\Users\Administrator>iottool getallshares
```

```
File Shares: 500, Chunks: 450
Vol  Shares: 1000, Chunks: 1050
Disk Shares: 2091, Chunks: 2091

C:\Users\Administrator>iottool /f getcachesize
CacheSize : 120795955200

C:\Users\Administrator>iottool /v getcachesize
CacheSize : 281857228800

C:\Users\Administrator>iottool /d getcachesize
CacheSize : 561298538496
```

See also getshares, getallshares, setshares.

setcachedevice

This command formats the specified disk, or volume, to be used as a caching device.

Setting the caching device consumes an IBM FlashCache Storage Accelerator license.

IBM FlashCache Storage Accelerator only supports the use of one caching device. If you have two IBM High IOPS devices or SSDs in your machine, they can be combined into one volume (e.g. RAID 0) and then that volume can be specified as the cache device.

iottool [/q] setcachedevice <cache-device-to-use>

where

/q -- forces the command into non-interactive mode. This means the command will not prompt for user input when it runs.

cache-device-to-use -- can be specified as follows:

- DiskXX -- where XX is the disk number. In order to use disk number, the disk cannot have any partitions or file systems on the disk.
- Drive-letter -- where drive-letter is the drive letter assigned to the volume. In order to use a Drive-letter there cannot be any file systems on the partition.

```
C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
```

```
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

Volume filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
H:\
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

C:\Users\Administrator>iottool setcachedevice disk4
If you continue, you will lose all the data on this device. Continue
[Y/n]?y

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 120795955200 (450 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
```

```
c:\program files\fileworker\ .exe
healthstatus: 0x1
Health Status Message: Caching disabled.

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 281857228800 (1050 chunks)
Cached Device List:
H:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 561298538496 (2091 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x0

-----------------------------------------------

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

Volume filter status:
```

```
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
H:\
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Size in use: 0 (0 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x49
Health Status Message: Caching disabled, No caching device assigned, No
caching capacity available.

C:\Users\Administrator>iottool setcachedevice d:
About to format \\.\d:
WARNING: If you continue, you will lose all the data on this drive. Do you
want to proceed? [Y/N]:y

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: D:\
Cache Size in use: 120795955200 (450 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
healthstatus: 0x1
Health Status Message: Caching disabled.

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
```

```
Cache Device Name: D:\
Cache Size in use: 281857228800 (1050 chunks)
Cached Device List:
H:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: D:\
Cache Size in use: 561298538496 (2091 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x1
Health Status Message: Caching disabled.
```

See also See resetcachedevice on page 49.

setcachepagesize

This command sets the page size used by the caching device. Each page in the cache uses a small amount of system memory. Consequently, by increasing the page size you can reduce the system memory usage. However, as page size gets larger you lose some granularity, where small reads or writes now require a larger page to be processed.

iottool [/v | /f | /d] setcachepagesize <cachepagesize>

/v — displays cachepagesize with the volume filter. This is the default option if the command is run without a switch.

/f — displays cachepagesize with the file filter.

/d— displays the cachepagesize with the disk filter.

cachepagesize--is the new page size specified in bytes. This value must be a minimum of 4096 bytes, and it must be an integral multiple of 4096. The maximum page size is 1 MB (or 256 X 4096).

```
C:\Users\Administrator>iottool setcachepagesize 1048576

C:\Users\Administrator>iottool getcachepagesize
CachePageSize : 1048576
```

See also getcachepagesize.

setcachesize

This command sets the cache size. By default this is the maximum size of your caching device. However, there is a small amount of system memory that is used by each page in the cache, and in memory constrained environments you may want to limit the size of the cache to limit the system memory impact. You could also increase the cache page size to reduce the system memory impact but this might adversely affect cache performance.

iottool setcachesize <cache-size-in-bytes>

> **cache-size-in-bytes** — sets the size of the cache. This value needs to be between 256 MB (268435456 bytes) and 2 TB (1099511627776 bytes), in integral multiples of 256 MB. (The maximum size would be 8192 X 256 MB.)

```
F:\>iottool getallshares
File Shares: 500, Chunks: 1250
Vol  Shares: 600, Chunks: 1495
Disk Shares: 700, Chunks: 1743

F:\>iottool /f getcachesize
CacheSize : 335544320000

F:\>iottool /v getcachesize
CacheSize : 401311006720

F:\>iottool /d getcachesize
CacheSize : 467882999808

F:\>iottool setcachesize 1073741824000

F:\>iottool getallshares
File Shares: 500, Chunks: 1114
Vol  Shares: 600, Chunks: 1332
Disk Shares: 700, Chunks: 1554

F:\>iottool /f getcachesize
CacheSize : 299037097984

F:\>iottool /v getcachesize
CacheSize : 357556027392

F:\>iottool /d getcachesize
CacheSize : 417148698624
```

See also getcachesize.

setmaxcachereadiosize

This command sets the maximum cache read size. After setting this value, any read requests whose size exceeds this value will be ignored by the cache, and the request will be passed directly to the primary.

iottool [/v | /f | /d] setmaxcachereadiosize <readiosize>

/v — sets the maxcachereadiosize for the volume filter. This is the default option if the command is run without a switch.

/f — sets the maxcachereadiosize for the file filter.

/d — sets the thmaxcachereadiosize for the disk filter.

readiosize— is the maximum read size that the cache will service. The minimum value is 4096 bytes and the maximum value is 1 MB, in integral multiples of 4096. The default size is 1048576.

```
C:\Users\Administrator>iottool /v getmaxcachereadiosize
MaxCacheReadIoSize : 1048576

C:\Users\Administrator>iottool /v setmaxcachereadiosize 81920

C:\Users\Administrator>iottool /v getmaxcachereadiosize
MaxCacheReadIoSize : 81920
```

See also getmaxcachereadiosize.

setmaxcachewriteiosize

This command sets the maximum cache write size. After setting this value, any write request whose size exceeds this value will not be written to the cache (but will be written to the primary).

iottool [/v | /f | /d] setmaxcachewriteiosize <writeiosize>

/v — sets the maxcachewriteiosize for the volume filter. This is the default option if the command is run without a switch.

/f — sets the maxcachewriteiosize for the file filter.

/d — sets the maxcachewriteiosize for the disk filter.

writeiosize— is the maximum write size that will be written to the cache. The minimum value is 4096 bytes and the maximum value is 1 MB, in integral multiples of 4096. The default size is 1048576.

```
C:\Users\Administrator>iottool getmaxcachewriteiosize
MaxCacheWriteIoSize : 1048576

C:\Users\Administrator>iottool setmaxcachewriteiosize 1048576
```

```
C:\Users\Administrator>iottool getmaxcachewriteiosize
MaxCacheWriteIoSize : 1048576
```

See also getmaxcachewriteiosize.

setmemlimit

Attention!

This command is only supported in 32-bit WIndows 2003.

This command sets the maximum memory that can be used by IBM FlashCache Storage Accelerator. If this limit is set too low, you will not be able to set your cache device. If your cache device has already been set, this command will not complete successfully if you try to set the memlimit too low.

iottool setmemlimit <memlimit>

memlimit — is the maximum amount of memory IBM FlashCache Storage Accelerator can use on the machine.

See also getmemlimit.

setshares

This command sets the specified shares value for the volume, file, or disk filter.

iottool [/v | /f | /d] setshares <shares-value>

/v — sets the shares for the volume filter. This is the default option if the command is run without a switch.

/f — sets the shares for the file filter.

/d — sets the shares for the disk filter.

shares-value— is the number of shares to set for the specified filter. The maximum share value is 8000.

Attention!

This command will stop cache on all filters, update shares, and start caching for all filters again.

```
C:\Users\Administrator>iottool getallshares
File Shares: 0, Chunks: 0
Vol  Shares: 100, Chunks: 3591
Disk Shares: 0, Chunks: 0

C:\Users\Administrator>iottool /d setshares 100
Setting 100 shares
```

```
C:\Users\Administrator>iottool getallshares
File Shares: 0, Chunks: 0
Vol  Shares: 100, Chunks: 1796
Disk Shares: 100, Chunks: 1795
```

See also getshares, setallshares, getallshares.

startcache

This starts the cache.

iottool [/a | /v | /f | /d] startcache

/a — starts caching on volumes, disks, and files according to rules that have been defined.

/v — starts caching on volumes. This is the default option if the command is run without a switch.

/f — starts caching on files.

/d — starts caching on disks.

```
C:\Users\Administrator>iottool /v startcache

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk0\DR0
Cache Size in use: 0 (0 chunks)
No file rules currently defined for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk0\DR0
Cache Size in use: 963951722496 (3591 chunks)
Cached Device List:
C:\
healthstatus: 0x0
```

```
Health Status Message: Caching working.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk0\DR0
Cache Size in use: 0 (0 chunks)
No devices currently selected for caching.
healthstatus: 0xf
Health Status Message: Caching disabled, No primary device added for
caching, No caching capacity available, No caching shares allocated.
```

See also See stopcache on page 64.

stats

This command prints basic CFS stats. An optional interval in seconds can be specified to show stats periodically. The command continues to run until it's killed.

iottool [/v | /f | /d] stats

/v — displays the volume caching stats. This is the default option if the command is run without a switch.

/f — displays the file caching stats..

/d — specifies the disk caching stats.

The following stats are reported:

- hits — the number of read IOs serviced from cache
- hit Ratio — the percentage of read IOs serviced from cache
- misses — the number of read IOs serviced from primary
- miss Ratio — the percentage of read IOs serviced from primary
- Number of Reads — the number of reads from the cache.
- Cache Page Reads — the number of read IOs issued to the cache
- Number of Writes — the number of writes to the cache
- Cache Page Writes — the number of write IOs issued to the cache

```
C:\>iottool stats
hits: 7667
hit Ratio: 49.38
misses: 7858
miss Ratio: 50.62
Number of Reads: 13904
Cache Page Reads: 15525
Number of Writes: 11112
Cache Page Writes: 13543
```

See also See diffstats on page 42.

status

This displays the current status of caching and IO logging for all or the specified layer.

iottool [/a | /v | /f | /d] status

/a — shows caching status on volumes, disks, and files.

/v — shows caching status on volumes. This is the default option if the command is run without a switch.

/f — shows caching status on files.

/d — shows caching status on disks.

The last value reported, **Health Status**, is reporting a bit mapped value. Multiple bits can be set, and the value reported is the sum of all bits.

0x200	0x100	0x80	0x40	0x20	0x10	0x8	0x4	0x2	0x1
Resize in Progress	Internal Error	Caching Device in Profiler Mode	Caching Device Not Assigned	Caching Device Failed	Caching Device Detached	No Cache Capacity	No VM Shares	No Primaries	Disabled

For example, after installing IBM FlashCache Storage Accelerator, status before configuring will often be 0x4B. This means that the caching device has not yet been assigned (0x40), and that there is currently no cache capacity (0x8), no primaries have been assigned (0x2), and the caching device is currently disabled (0x1). 0x40 + 0x8 + 0x2 + 0x1 = 0x4B.

If no bits are set (all zeros) the status is OK.

```
C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
healthstatus: 0xd
Health Status Message: Caching disabled, No caching capacity available, No
caching shares allocated.

Volume filter status:
```

```
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 963951722496 (3591 chunks)
Cached Device List:
H:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 0 (0 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0xd
Health Status Message: Caching disabled, No caching capacity available, No
caching shares allocated.
```

stopcache

This stops caching for all or specified layers. To start again use the startcache command.

iottool [/a | /v | /f | /d] stopcache

/a — stops caching on volumes, disks, and files according to rules that have been defined.

/v — stops caching on volumes. This is the default option if the command is run without a switch.

/f — stops caching on files.

/d — stops caching on disks.

```
C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
```

```
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 120795955200 (450 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
c:\program files\fileworker\ .exe
healthstatus: 0x0
Health Status Message: Caching working.

Volume filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 281857228800 (1050 chunks)
Cached Device List:
H:\
healthstatus: 0x0
Health Status Message: Caching working.

Disk filter status:
Caching Status: Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 561298538496 (2091 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x0
Health Status Message: Caching working.

C:\Users\Administrator>iottool /a stopcache

C:\Users\Administrator>iottool /a status

File filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 120795955200 (450 chunks)
Cached Device List:
e:\databases\
e:\db\db.dat
```

```
c:\program files\fileworker\ .exe
healthstatus: 0x1
Health Status Message: Caching disabled.

Volume filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 281857228800 (1050 chunks)
Cached Device List:
H:\
healthstatus: 0x1
Health Status Message: Caching disabled.

Disk filter status:
Caching Status: Not Started
Logging Status: NOT Logging
VLUN: Not Present
Mode: Caching
Cache Device Name: \Device\Harddisk4\DR4
Cache Size in use: 561298538496 (2091 chunks)
Cached Device List:
\Device\Harddisk2\DR2
healthstatus: 0x1
Health Status Message: Caching disabled.
```

See also See startcache on page 61.

supportsave

This command captures the system and application event logs and other stats in a IOTSupport*nn*.cab file. If the /o option is not specified, the IOTSupport*nn*.cab file is place in the install directory which by default is "C:\Program Files\IBM\IBM FlashCache Storage Accelerator\."

iottool supportsave [/o <full-file-name>]

where

> **full-file-name** — is the full path and filename where you want the logs and statistics written.

For example, the command output will look something like this.

```
C:\Users\Administrator>iottool supportsave
C:\Program Files\IBM\IBM FlashCache Storage Accelerator
Capturing File System Minifilter Information
Capturing FSUTIL FSINFO
Capturing FSUTIL FSINFO for drive C:\
Capturing FSUTIL FSINFO for drive D:\
Capturing FSUTIL FSINFO for drive E:\
Capturing FSUTIL FSINFO for drive F:\
Capturing FSUTIL FSINFO for drive G:\
Capturing FSUTIL FSINFO for drive H:\
Saving System event log
 Capturing registry settings
Capturing IOT Information
Capturing system information
Running fio-bugreport
Report output: fio-bugreport-20140516_192453.cab
Generating bug report.  Please wait, this may take awhile...
------------------------------------------------------------
Gathering all Windows Event Logs...DONE
Gathering Fusion-io Windows Event Logs...DONE
Gathering System Information...DONE
Gathering installer logs...DONE
Running fio utilities...DONE
Compressing to CAB file...DONE
Bug report has successfully been created: fio-bugreport-20140516_
192453.cab
  Please attach this file to your support case.
  If you do not have an open support case for this issue, please open a
support
  case with a problem description and then attach this file to your new
case.
Capturing VDS Information
Making cab file from fltmc-filters.txt fltmc-instances.txt fltmc-
volumes.txt fsutil-drives.txt fsutil-fsinfo-C.txt fsuti
l-fsinfo-D.txt fsutil-fsinfo-E.txt fsutil-fsinfo-F.txt fsutil-fsinfo-G.txt
fsutil-fsinfo-H.txt reg-diskclass.txt reg-vol
class.txt reg-csvolclass.txt reg-volflt.txt reg-diskflt.txt reg-fsflt.txt
reg-scsiflt.txt iot-fsdsstats.txt iot-voldssta
ts.txt iot-diskdsstats.txt iot-allstatus.txt iot-shares.txt iot-stats.txt
ip-config.txt net-use.txt sc-query.txt driver-
query.txt process-query.txt session-query.txt vdsinfo.txt
System.Event.evtx
cab file index is 1
```

```
Compressing fltmc-filters.txt
Compressing fltmc-instances.txt
Compressing fltmc-volumes.txt
Compressing fsutil-drives.txt
Compressing fsutil-fsinfo-C.txt
Compressing fsutil-fsinfo-D.txt
Compressing fsutil-fsinfo-E.txt
Compressing fsutil-fsinfo-F.txt
Compressing fsutil-fsinfo-G.txt
Compressing fsutil-fsinfo-H.txt
Compressing reg-diskclass.txt
Compressing reg-volclass.txt
Compressing reg-csvolclass.txt
Compressing reg-volflt.txt
Compressing reg-diskflt.txt
Compressing reg-fsflt.txt
Compressing reg-scsiflt.txt
Compressing iot-fsdsstats.txt
Compressing iot-voldsstats.txt
Compressing iot-diskdsstats.txt
Compressing iot-allstatus.txt
Compressing iot-shares.txt
Compressing iot-stats.txt
Compressing ip-config.txt
Compressing net-use.txt
Compressing sc-query.txt
Compressing driver-query.txt
Compressing process-query.txt
Compressing session-query.txt
Compressing vdsinfo.txt
Compressing System.Event.evtx
The file "fltmc-filters.txt" (Size: 336) has been added to cabinet
"IOTSupport1.cab"
The file "fltmc-instances.txt" (Size: 968) has been added to cabinet
"IOTSupport1.cab"
The file "fltmc-volumes.txt" (Size: 798) has been added to cabinet
"IOTSupport1.cab"
The file "fsutil-drives.txt" (Size: 36) has been added to cabinet
"IOTSupport1.cab"
The file "fsutil-fsinfo-C.txt" (Size: 1577) has been added to cabinet
"IOTSupport1.cab"
The file "fsutil-fsinfo-D.txt" (Size: 1586) has been added to cabinet
"IOTSupport1.cab"
The file "fsutil-fsinfo-E.txt" (Size: 1587) has been added to cabinet
"IOTSupport1.cab"
The file "fsutil-fsinfo-F.txt" (Size: 311) has been added to cabinet
```

```
 to cabinet "IOTSupport1.cab"
The file "vdsinfo.txt" (Size: 33215) has been added to cabinet
"IOTSupport1.cab"
The file "System.Event.evtx" (Size: 4263936) has been added to cabinet
"IOTSupport1.cab"
Estimated size: 0, Actual Size: 701079
The operation completed successfully.


C:\Users\Administrator>cd "c:\Program Files\IBM\IBM FlashCache Storage
Accelerator"

c:\Program Files\IBM\IBM FlashCache Storage Accelerator>dir *.cab
 Volume in drive C has no label.
 Volume Serial Number is DA6C-9CB6

 Directory of c:\Program Files\IBM\IBM FlashCache Storage Accelerator

05/16/2014  01:26 PM           297,096 fio-bugreport-20140516_192453.cab
05/16/2014  01:26 PM           701,079 IOTSupport1.cab
               2 File(s)        998,175 bytes
               0 Dir(s)  214,625,951,744 bytes free
```

uninstalllicense

This command uninstalls any IBM FlashCache Storage Accelerator license that is install on your machine.

> **Attention!**
>
> If you run this command you will lose any remaining time on the built-in evaluation license.

If the cache device on the host is removed, the host remains licensed until the this command is run or until IBM Flash Management Console removes the license to give it to a different host.

The built-in evaluation license cannot be uninstalled directly. But you can uninstall any license that was deployed as a file.

```
C:\Transfer\licenses>iottool getlicenseinfo
license_sn::FCS_TESTCUSTOMER_ioTurbineDirect_001
license_product::ioTurbine-Direct
license_description::ioTurbine-Direct Ver 2
license_type::PRODUCTION
license_expires::2017-apr-8

C:\Transfer\licenses>iottool uninstalllicense

C:\Transfer\licenses>iottool getlicenseinfo

C:\Transfer\licenses>
```

version

This command displays version information for the IBM FlashCache Storage Accelerator software for Windows that is running on your machine.

iottool [/v | /f | /d] version

/v — displays the volume caching stats. This is the default option if the command is run without a switch.

/f — displays the file caching stats..

/d — specifies the disk caching stats.

```
C:\Users\Administrator>iottool version
release: '2.2.0.7316'
svnid: '7316'
copyright: 'Copyright (c) 2012-2014 Fusion-io, Inc.  All Rights Reserved.'
productName: 'nacelle'
buildType: 'prod'
buildDate: '04/09/2014'
buildTime: 1397048278
driver-release: '2.2.0.7316'
driver-svnid: '7316'
releaseType: 'B'
author: 'devp (48b146be)'
srchost: 'bldmast'
srcdir: '/home/devp/jenkins/workspace/nacelle-master/nacelle'
isBmw: no
isOfficial: yes
isPromoted: no
```

Appendix A: Windows cluster configuration

You can use IBM FlashCache Storage Accelerator with Windows clusters. The setup instructions are described below.

> **Attention!**
>
> Do not use IBM Flash Management Console to manage cluster volumes. Manage volumes with Microsoft Failover Cluster Manager. For adding and removing cached volumes in a cluster **do not** use the `iottool` interface.

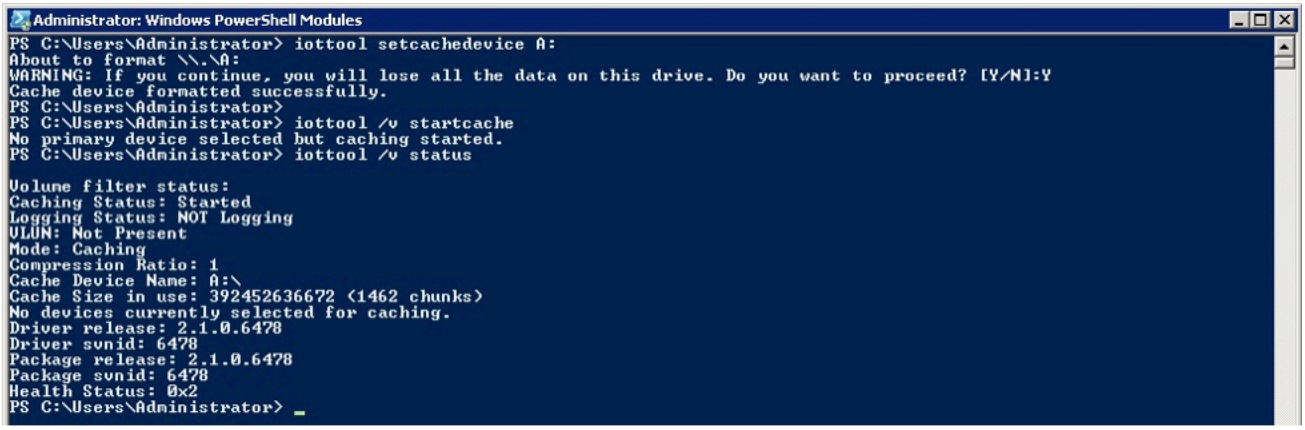
Prerequisites

- The Failover Cluster Manager Feature has been installed, and a cluster is up and running.
- Shared storage exists and is accessible by every node in the cluster.
- Desktop Experience Feature has been installed (for (Windows 2008 SP2 only)

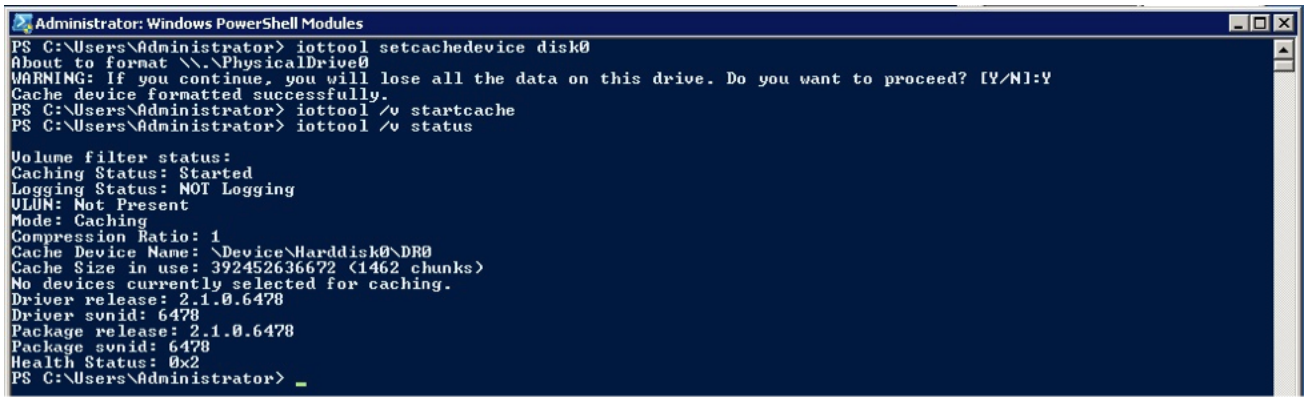
Actions to perform on each node in the cluster

- Install IBM FlashCache Storage Accelerator and license it.
- From the command line, set a cache device (see `iottool setcachedevice`). Either a volume or a disk can be used as a cache device.
- From the command line start caching (see `iottool startcache`)

The screen shot below provides an example of setting a volume as a caching device.



The screen shot below provides and example of setting a disk as a caching device.



Actions to perform on one node in the cluster

- Run **`iot-resource.cmd`** after installing IBM FlashCache Storage Accelerator to register the cluster resource DLL. **`iotresource.cmd`** is in the installation directory, which by default is "C:\Program Files\IBM\IBM FlashCache Storage Accelerator\" Installing the cluster resource DLL on one node will install it on every node. Execute this command to install the resource DLL:

  ```
  iot-resource.cmd -install
  ```

  Alternatively the following command can also be used to install the cluster resource DLL:

  ```
  cluster restype "ioturbine-resource" /create /dll:
  "C:\Program Files\IBM\IBM FlashCache Storage
  Accelerator\"
  ```

Attention!

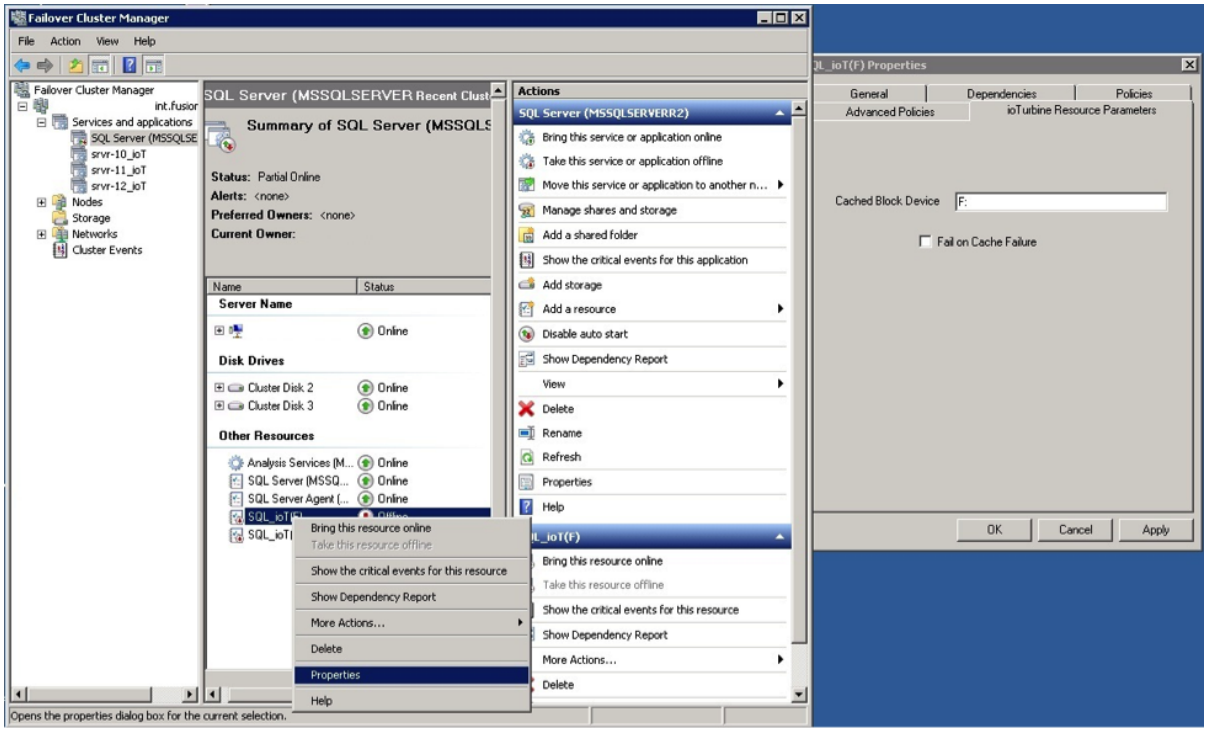
For Windows Server 2012, the command line tool `cluster.exe` is not added by default. You will need to add it as a feature before you run `iot-resource.cmd`. -To add this feature click the following from the Server Manager: **Local Server > Manage > Add Roles and Features Wizard > Features > Remote Server Administration Tools > Feature Administration Tools > Failover Clustering Tools > Failover Cluster Command Interface.**

- If you do not already have cluster group under Services and Applications for which you want to use caching, create one in the Failover Cluster Manager.
  - Open the Failover Cluster Manager:
  - Right-click **Services and Applications > More Actions > Create Empty Service or Application**.
  - Rename the Empty Service or Application to IBM FlashCache Storage Accelerator.
  - Add storage resources to the service
    - Right-click the new IBM FlashCache Storage Accelerator service and select **Add Storage**
    - Select the disk(s) to be cached from the Add Storage dialog box
    - Click **OK**
- Add the ioTurbine caching resources to the service

- Right-click the IBM FlashCache Storage Accelerator service and select **Add a resource**
- Select **Add ioturbine-resource** from the More resources sub-menu

- In the middle pane, which is titled Summary of IBM FlashCache Storage Accelerator, right-click the **New ioturbine-resource** in the Other Resources section, select **Properties** and perform the following steps:

  - In the General tab rename the resource. Choose a name that refers to the resource you are caching. This will distinguish it from other IBM FlashCache Storage Accelerator resources.
  - Set the Resource dependency in the Dependencies tab. Select the Disk Drive being cached. This prevents caching from starting until the Drive has been brought online.
  - In the Properties Tab set the device to be cached (Primary device) by entering the volume letter in ioT Cached Block Device Value field.

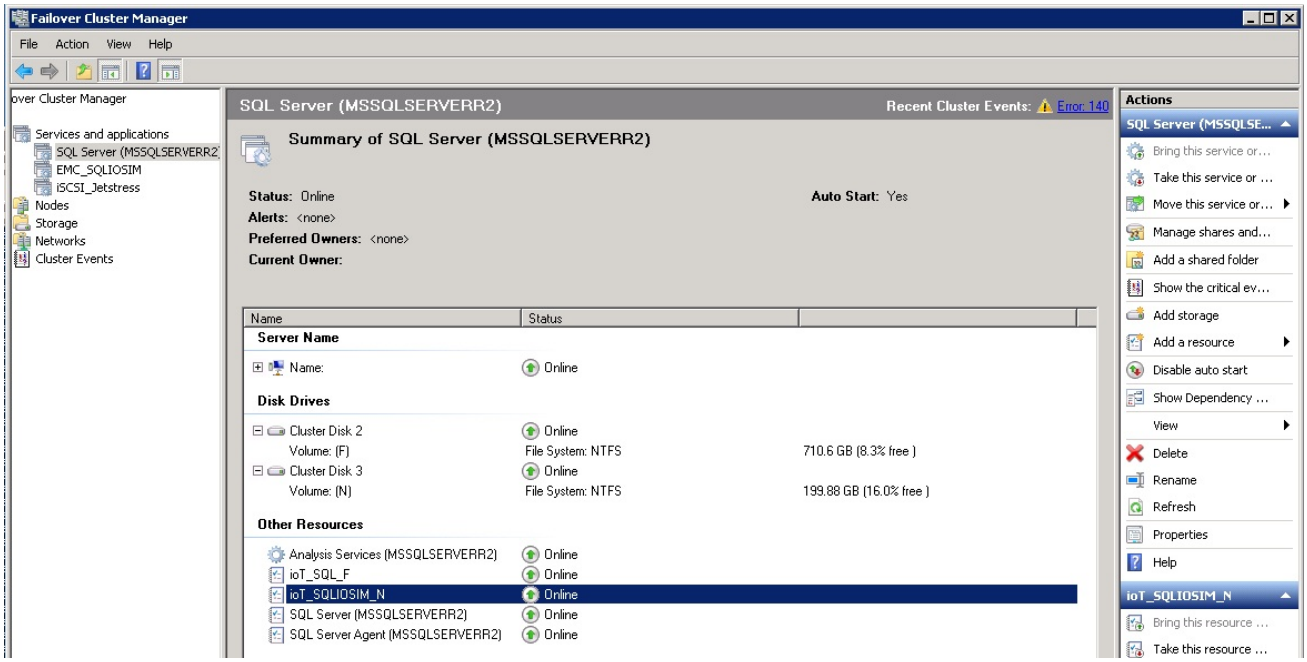


Note in this example that the cached primary device is referred to as a "Cluster Disk" in the Cluster Failover Manager. Without the dependencies set-up properly, failovers may cause the IBM FlashCache Storage Accelerator resource to fail. Dependencies are necessary to ensure the Cluster Disk comes online before the IBM FlashCache Storage Accelerator resource.

Additional notes

You can create multiple IBM FlashCache Storage Accelerator resources in the same group (Service and Applications). The following illustrates two IBM FlashCache Storage Accelerator cluster resources; 'ioT_SQL_F' and 'ioT_SQLIOSIM_N', for the Primary devices F and N respectively. Note that there is one resource for each Cluster Disk (Primary device). Also note that on a cluster node which is not currently

active, the 'Cached Device' field in the output of the iottool CLI will be blank. The iot-resource.dll enables local caching when the cluster resource becomes active on the local node.



Appendix B: Windows Hyper-V configuration

You can use IBM FlashCache Storage Accelerator to cache virtual machines running in a Hyper-V environment. Two Hyper-V configurations are supported:

- Hyper-V shared nothing
- Hyper-V with Cluster Shared Volumes (CSVs)

Using IBM FlashCache Storage Accelerator with shared nothing Hyper-V

IBM FlashCache Storage Accelerator caches the file systems that Hyper-V VMs are using. To cache these file systems, install IBM FlashCache Storage Accelerator software on any Hyper-V hosts where Hyper-V VMs are running. Follow the standard installation procedures described in the *IBM FlashCache Storage Accelerator Installation and Upgrade Guide for Windows and Linux*. After installation is complete, configure IBM FlashCache Storage Accelerator to cache the volumes or disks where the Hyper-V virtual machines are stored.

Attention!

Select either the IBM FlashCache Storage Accelerator caching filter for **Volumes** or for **Disks**. Do not select the caching filter for **Files**. IBM FlashCache Storage Accelerator does not support caching specific .VHD or .VHDX files.

Using IBM FlashCache Storage Accelerator 2.2.0 with Hyper-V and Cluster Shared Volumes (CSV)

Attention!

IBM FlashCache Storage Accelerator does not support the simultaneous use of CSV caching and failover clusters. If you are running Hyper-V in a failover cluster environment you cannot use IBM FlashCache Storage Accelerator to cache CSV. Likewise, do not include a server that is configured for CSV caching in a failover cluster.

IBM FlashCache Storage Accelerator can cache a cluster shared volume (CSV). Follow the standard installation procedures described in the *IBM FlashCache Storage Accelerator Installation and Upgrade Guide for Windows and Linux* to install IBM FlashCache Storage Accelerator **on each node that accesses the CSV**. Then configure IBM FlashCache Storage Accelerator to cache the CSV. Be aware that caching CSVs with IBM FlashCache Storage Accelerator has the following limitations:

- Use only the IBM FlashCache Storage Accelerator volume caching filter with CSVs. The disk and file caching filter have no effect on CSVs.
- Use only with CSV hosted on Windows Server 2012 or Windows Server 2012 R2
- Rebooting a VM that is running on a CSV will invalidate the cache for that CSV.

Download location

Support related documentation is available at:

http://www.ibm.com/supportportal

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