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# How does the `scsibadblk(ADM)` utility work?

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## Keywords

`scsibadblk(ADM)` work function unix 3.2 v4 4.2 automatic write remapping read ARR AWR reassign hard **disk** sector track badtrk arr awr awre arre block

## Release

SCO UNIX System V/386 Release 3.2 Operating System Version 4.2

## Problem

I want to understand how the `scsibadblk(ADM)` utility works in order to determine the resulting possible limitations.

## Solution

The `scsibadblk(ADM)` utility uses the intelligence and features present in many SCSI hard **disks** to map out bad blocks on the **disk**.

The utility can provide two different types of bad blocking:

### (i) Dynamic

The **disk** itself detects when **disk** blocks are defective, and dynamically maps the blocks out. As blocks fail, and are detected to have failed (i.e., are used) they will be mapped out by the **disk**. The `scsibadblk(ADM)` command can enable or disable this feature if it is supported by the **disk**.

This is termed Automatic Write Remapping (AWR), Automatic Read Remapping (ARR), or Automatic Write/Read Remapping(AWRR) in some **disk** technical manuals. In this article, AWRR will be used to refer to the general facility.

Note that AWRR can only deal with 'recoverable' errors, i.e., those that can be detected and corrected with the **disk** data encoding scheme. Non-recoverable errors (such as a complete failure of a block) must be explicitly mapped out with `scsibadblk(ADM)`.

In general, it is likely that data will be lost when a non-recoverable error

occurs.

(ii) Static

The **disk** is scanned for blocks which, at that time, are defective. Any that are found are mapped out using the SCSI <reassign> command. Blocks which fail later will not be mapped out. This is similar to the wd1010/ST506 based **badtrk(ADM)** command, although the mapping out is performed by the **disk** firmware rather than the UNIX SCSI adapter driver.

The **scsibadblk(ADM)** command will query a **disk** to determine whether the **disk** is a SCSI-1, or SCSI-2 **disk** using the SCSIUSERCMD ioctl() to send a SCSI <inquiry> command.

The **scsibadblk(ADM)** can only control AWRR on SCSI-2 **disks**.

If the **disk** is SCSI-2, the **scsibadblk(ADM)** command queries the **disk** to determine if AWRR is supported, and whether it can be enabled or disabled. If it can, the user is presented with a menu of options the **disk** supports.

If the **disk** does not support AWRR the **scsibadblk(ADM)** command will scan the **disk** for bad blocks.

The scanning operates in clusters of (10) blocks for efficiency. If a problem is found, the cluster will be re-scanned to determine the exact block(s) failing.

Blocks are checked by computing checksums for blocks and comparing the checksums rather than the blocks directly. The algorithm used is that used by 'sum -r'.

Scsibadblk(ADM) uses the SCSI <reassign> command to request the **disk** to mapout any bad blocks found.

## Notes

If AWR, ARR or AWRR is enabled or disabled the **disk** may reset to its default behavior on system reset.

Not all SCSI-2 **disks** support AWR, ARR or AWRR.

Not all SCSI **disks** support the SCSI <reassign> command.

The default behavior of drives is manufacturer or model specific.

Attempts to mapout bad blocks (using the SCSI reassign command) may fail because the **disk** does not support the SCSI command, or because there are no blocks available on the **disk** to replace the defective block. In the first instance, the error message will be:

```
scsibadblk: re_allocation failed
```

In the second instance, the error message will be:

```
scsibadblk: re_allocation space full
```

Specify the "raw" device when using [scsibadblk\(ADM\)](#). For example, you may run the following command to access the the first disk:

```
# scsibadblk -f /dev/rhd00
```

[scsibadblk\(ADM\)](#) should only be run on devices, or areas of devices which are not in use. For devices containing filesystems the command should be used after unmounting the filesystem.

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