

# IDE ATAPI streaming tape driver

This driver is a part of the Linux ide driver.

The driver, in co-operation with ide.c, basically traverses the request-list for the block device interface. The character device interface, on the other hand, creates new requests, adds them to the request-list of the block device, and waits for their completion.

The block device major and minor numbers are determined from the tape's relative position in the ide interfaces, as explained in ide.c.

The character device interface consists of the following devices:

ht0	major 37, minor 0	first IDE tape, rewind on close.
ht1	major 37, minor 1	second IDE tape, rewind on close.
...		
nht0	major 37, minor 128	first IDE tape, no rewind on close.
nht1	major 37, minor 129	second IDE tape, no rewind on close.
...		

The general magnetic tape commands compatible interface, as defined by include/linux/mtio.h, is accessible through the character device.

General ide driver configuration options, such as the interrupt-unmask flag, can be configured by issuing an ioctl to the block device interface, as any other ide device.

Our own ide-tape ioctls can be issued to either the block device or the character device interface.

Maximal throughput with minimal bus load will usually be achieved in the following scenario:

1. ide-tape is operating in the pipelined operation mode.
2. No buffering is performed by the user backup program.

Testing was done with a 2 GB CONNER CTMA 4000 IDE ATAPI Streaming Tape Drive.

Here are some words from the first releases of hd.c, which are quoted in ide.c and apply here as well:

- Special care is recommended. Have Fun!

## Possible improvements

1. Support for the ATAPI overlap protocol.

In order to maximize bus throughput, we currently use the DSC overlap method which enables ide.c to service requests from the other device while the tape is busy executing a command. The DSC overlap method involves polling the tape's status register for the DSC bit, and servicing the other device while the tape isn't ready.

In the current QIC development standard (December 1995), it is recommended that new tape drives will *in addition* implement the ATAPI overlap protocol, which is used for the same purpose - efficient use of the IDE bus, but is interrupt driven and thus has much less CPU overhead.

ATAPI overlap is likely to be supported in most new ATAPI devices, including new ATAPI cdroms, and thus provides us a method by which we can achieve higher throughput when sharing a (fast) ATA-2 disk with any (slow) new ATAPI device.