

LDM - Logical Disk Manager (Dynamic Disks)

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Overview

Windows 2000, XP, and Vista use a new partitioning scheme. It is a complete replacement for the MSDOS style partitions. It stores its information in a 1MiB journalled database at the end of the physical disk. The size of partitions is limited only by disk space. The maximum number of partitions is nearly 2000.

Any partitions created under the LDM are called "Dynamic Disks". There are no longer any primary or extended partitions. Normal MSDOS style partitions are now known as Basic Disks.

If you wish to use Spanned, Striped, Mirrored or RAID 5 Volumes, you must use Dynamic Disks. The journalling allows Windows to make changes to these partitions and filesystems without the need to reboot.

Once the LDM driver has divided up the disk, you can use the MD driver to assemble any multi-partition volumes, e.g. Stripes, RAID5.

To prevent legacy applications from repartitioning the disk, the LDM creates a dummy MSDOS partition containing one disk-sized partition. This is what is supported with the Linux LDM driver.

A newer approach that has been implemented with Vista is to put LDM on top of a GPT label disk. This is not supported by the Linux LDM driver yet.

Example

Below we have a 50MiB disk, divided into seven partitions.

Note

The missing 1MiB at the end of the disk is where the LDM database is stored.

| Device | Offset Bytes | Sectors | MiB | Size Bytes | Sectors | MiB |
|--------|--------------|---------|-----|------------|---------|-----|
| hda | 0 | 0 | 0 | 52428800 | 102400 | 50 |
| hda1 | 51380224 | 100352 | 49 | 1048576 | 2048 | 1 |
| hda2 | 16384 | 32 | 0 | 6979584 | 13632 | 6 |
| hda3 | 6995968 | 13664 | 6 | 10485760 | 20480 | 10 |
| hda4 | 17481728 | 34144 | 16 | 4194304 | 8192 | 4 |
| hda5 | 21676032 | 42336 | 20 | 5242880 | 10240 | 5 |
| hda6 | 26918912 | 52576 | 25 | 10485760 | 20480 | 10 |
| hda7 | 37404672 | 73056 | 35 | 13959168 | 27264 | 13 |

The LDM Database may not store the partitions in the order that they appear on disk, but the driver will sort them.

When Linux boots, you will see something like:

```
hda: 102400 sectors w/32KiB Cache, CHS=50/64/32
hda: [LDM] hda1 hda2 hda3 hda4 hda5 hda6 hda7
```

Compiling LDM Support

To enable LDM, choose the following two options:

- "Advanced partition selection" CONFIG_PARTITION_ADVANCED
- "Windows Logical Disk Manager (Dynamic Disk) support" CONFIG_LDM_PARTITION

If you believe the driver isn't working as it should, you can enable the extra debugging code. This will produce a LOT of output. The option is:

- "Windows LDM extra logging" CONFIG_LDM_DEBUG

N.B. The partition code cannot be compiled as a module.

As with all the partition code, if the driver doesn't see signs of its type of partition, it will pass control to another driver, so there is no harm in enabling it.

If you have Dynamic Disks but don't enable the driver, then all you will see is a dummy MSDOS partition filling the whole disk. You

won't be able to mount any of the volumes on the disk.

Booting

If you enable LDM support, then lilo is capable of booting from any of the discovered partitions. However, grub does not understand the LDM partitioning and cannot boot from a Dynamic Disk.

More Documentation

There is an Overview of the LDM together with complete Technical Documentation. It is available for download.

<http://www.linux-ntfs.org/>

If you have any LDM questions that aren't answered in the documentation, email me.

Cheers,

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