Lustre* Manual

High Performance Data Division

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LUG13: April 17th 2013

* Other names and brands may be claimed as the property of others.

Overview

What is in the Lustre manual this instant?

Network Request Scheduler

Multiple MDTs!

4MB RPCs

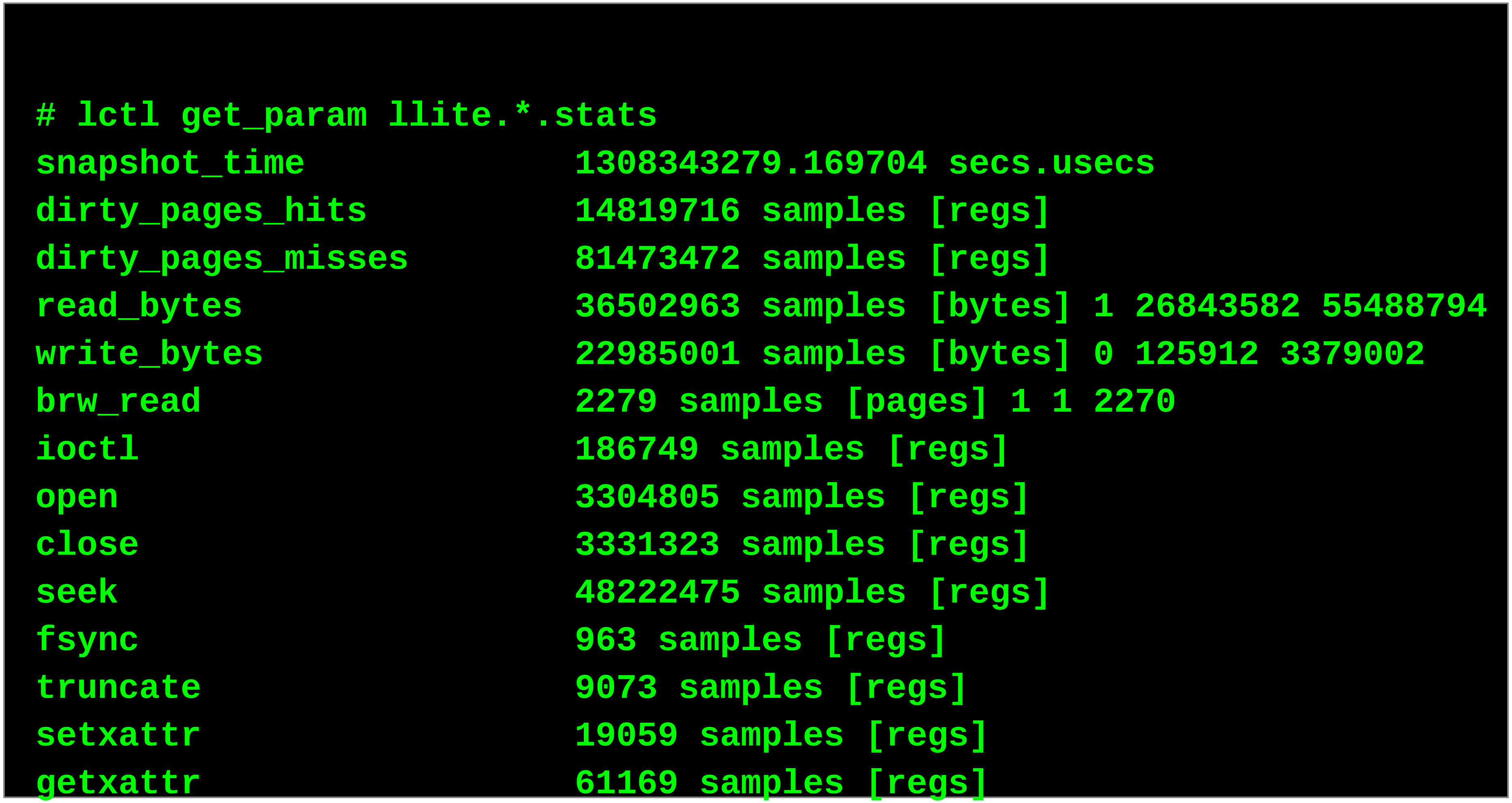
But that's not all...

Multiple MDTs (DNE)	yesterday
Lustre Tuning parameters	yesterday
LFSCK	this morning
Wireshark	this morning
Change-logs	tomorrow

JobStats, mds-survey, tuning, debugging etc, etc, etc

History

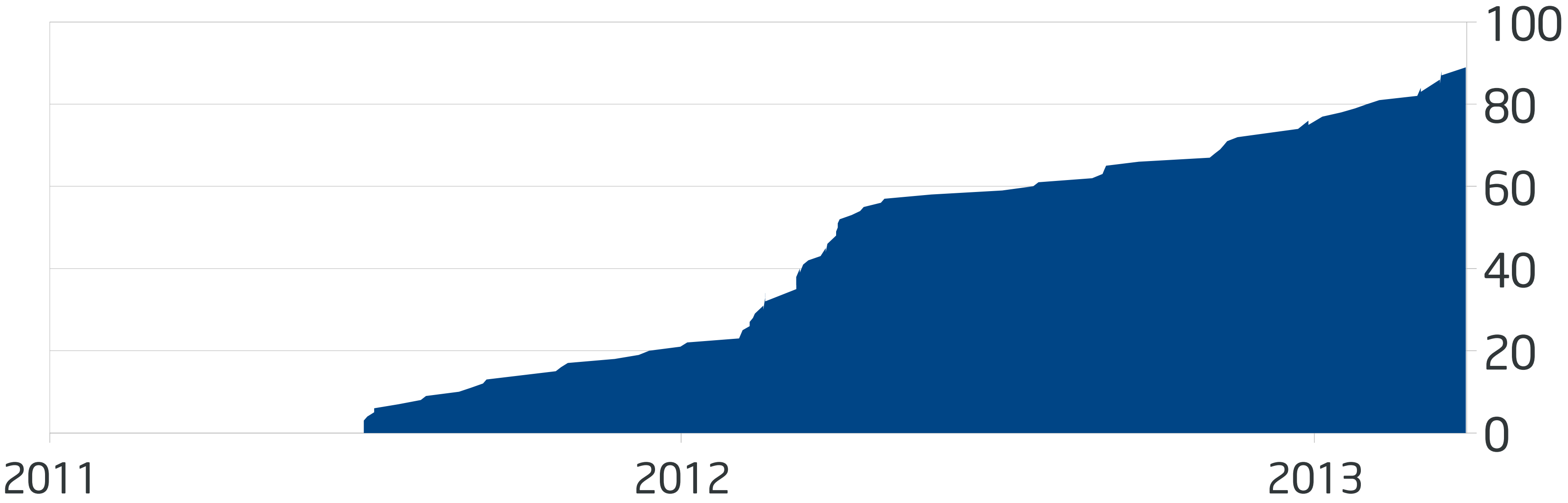
For me, it all started with:



```
# lctl get_param llite.*.stats
snapshot_time             1308343279.169704 secs.usecs
dirty_pages_hits          14819716 samples [regs]
dirty_pages_misses        81473472 samples [regs]
read_bytes                36502963 samples [bytes] 1 26843582 55488794
write_bytes               22985001 samples [bytes] 0 125912 3379002
brw_read                  2279 samples [pages] 1 1 2270
ioctl                     186749 samples [regs]
open                      3304805 samples [regs]
close                     3331323 samples [regs]
seek                      48222475 samples [regs]
fsync                     963 samples [regs]
truncate                  9073 samples [regs]
setxattr                  19059 samples [regs]
getxattr                  61169 samples [regs]
```

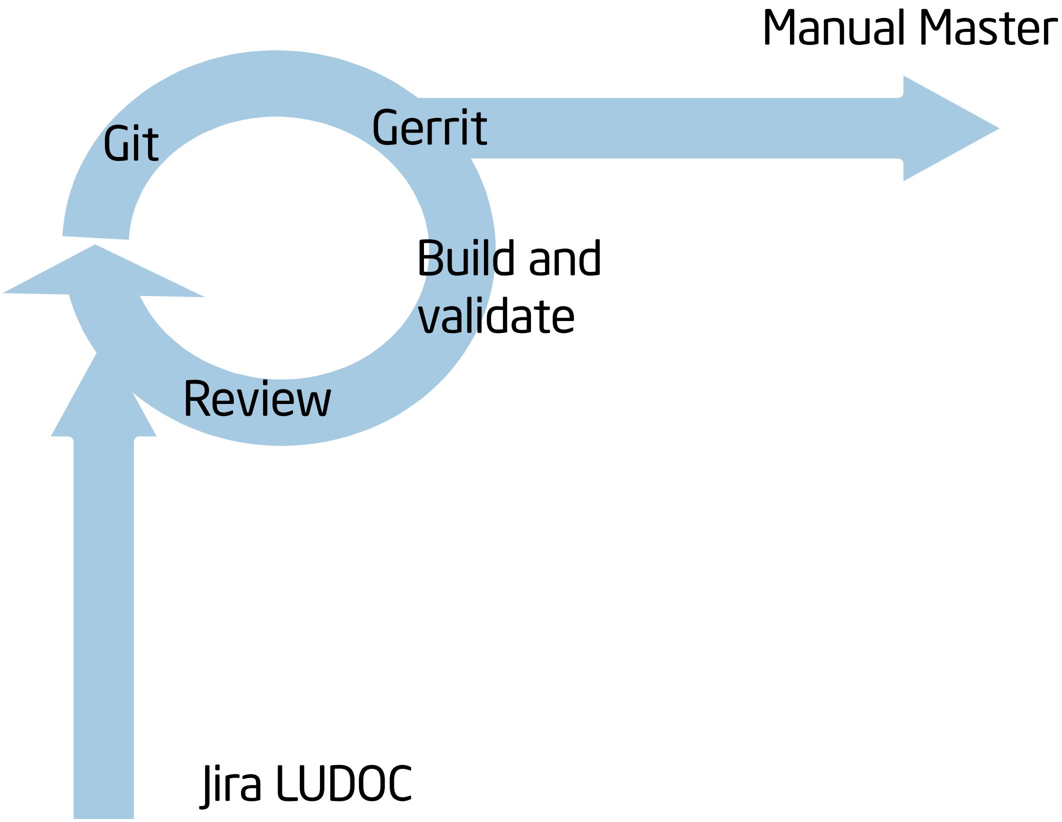
Current status

- 118000 words, 13000 lines
- Available as pdf, html, epub
- ~90 commits



Contributing

Engineering work-flow


Manual Master

Git

Gerrit

Build and validate

Review

Jira LUDOC

Lustre 2.x Filesystem

Operations Manual

Lustre 2.x Filesystem : Operations Manual

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Lustre Manual archaeology

Docbook

- Industry standard
- xml
- 400 tags
- xml editing

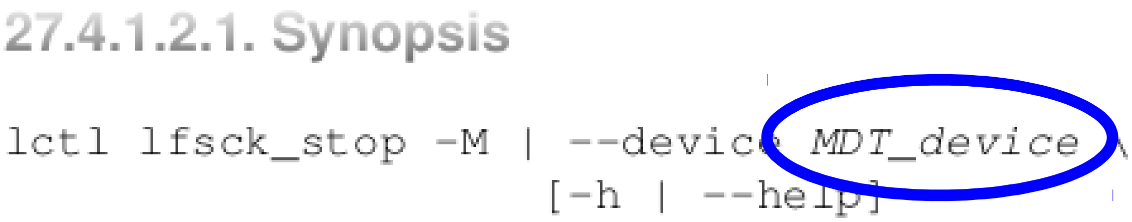
- Vim
- Emacs
- Bluefish
- Serna
- oXygen XML Editor

NOTE: a good tool will support `xinclude' and be Docbook5 aware.

Lustre Manual archaeology

Docbook tags: an example with <replaceable>

```
<title>Synopsis</title>
<screen>
   lctl lfsck_stop -M |
       --device <replaceable>MDT_device</replaceable> \
                    [-h | --help]
</screen>
</section>
```

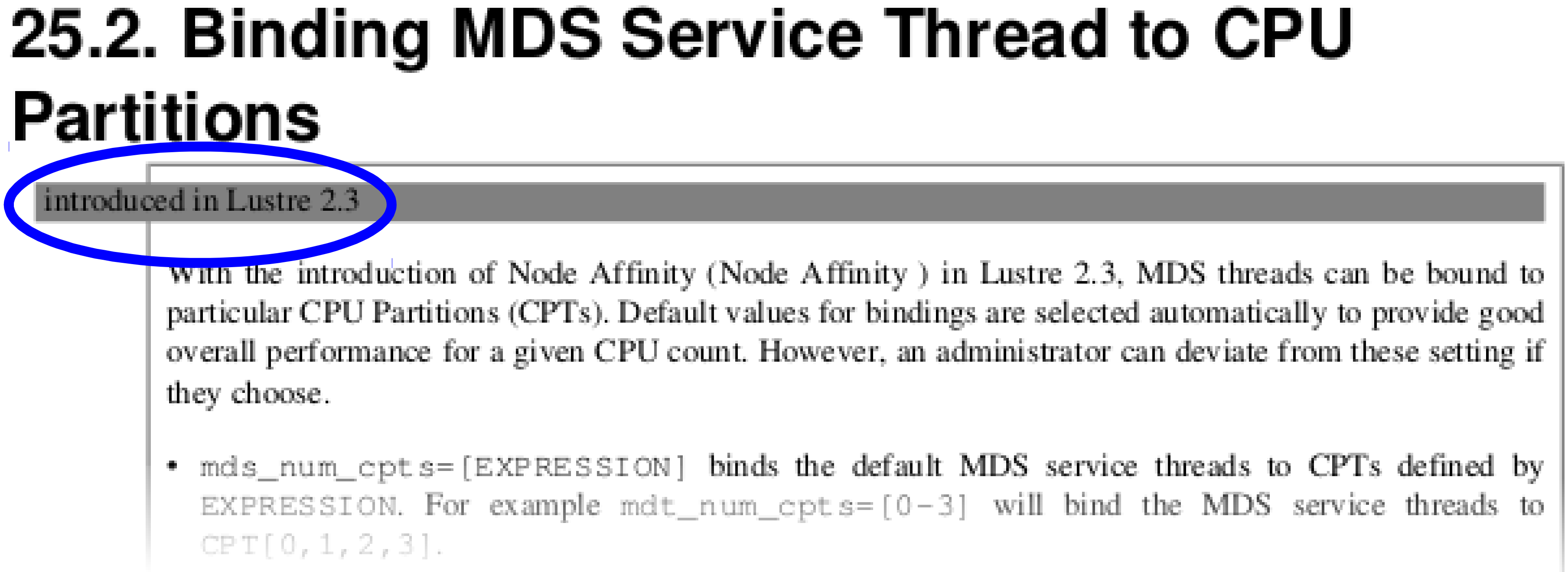


27.4.1.2.1. Synopsis

```
lctl lfsck_stop -M | --device MDT_device \
                   [-h | --help]
```

Lustre Manual specifics

```
<* conditional='l23'>Lustre 2.3| specific text.</*>
```



25.2. Binding MDS Service Thread to CPU Partitions

introduced in Lustre 2.3

With the introduction of Node Affinity (Node Affinity) in Lustre 2.3, MDS threads can be bound to particular CPU Partitions (CPTs). Default values for bindings are selected automatically to provide good overall performance for a given CPU count. However, an administrator can deviate from these setting if they choose.

- `mds_num_cpts=[EXPRESSION]` binds the default MDS service threads to CPTs defined by `EXPRESSION`. For example `mdt_num_cpts=[0-3]` will bind the MDS service threads to `CPT[0,1,2,3]`.

Contributing continued...

- Low barriers to entry with submissions to

  http://jira.hpdd.intel.com/browse/LUDOC

- Lots of opportunities for improvements, large and small

What to expect in future:

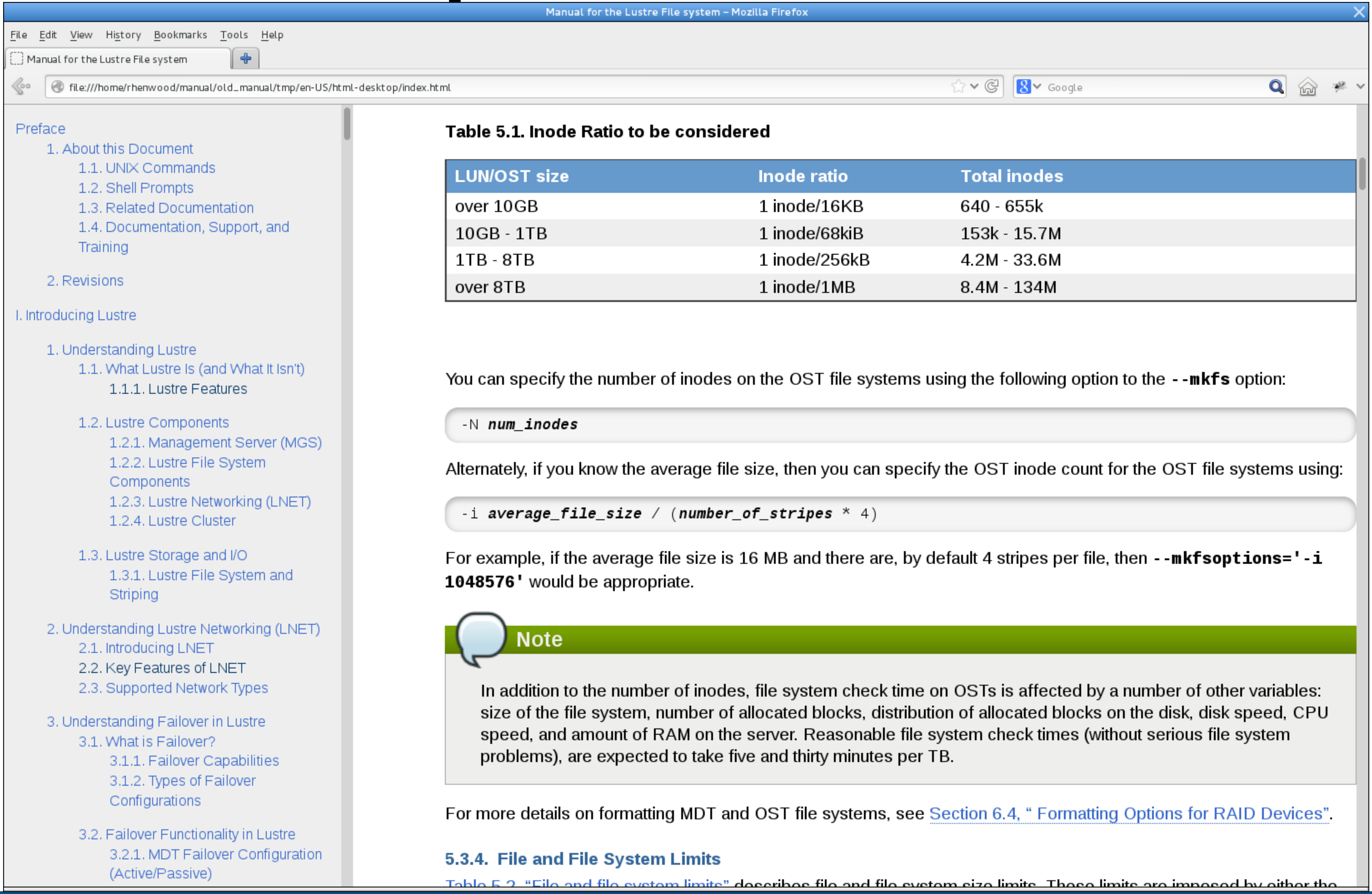

Manual for the Lustre File system – Mozilla Firefox
File
Edit
View
History
Bookmarks
Tools
Help
Manual for the Lustre File system
file:///home/rhenwood/manual/old_manual/tmp/en-US/html-desktop/index.html
Google

Table 5.1. Inode Ratio to be considered

LUN/OST size	Inode ratio	Total inodes
over 10GB	1 inode/16KB	640 - 655k
10GB - 1TB	1 inode/68kiB	153k - 15.7M
1TB - 8TB	1 inode/256kB	4.2M - 33.6M
over 8TB	1 inode/1MB	8.4M - 134M

You can specify the number of inodes on the OST file systems using the following option to the **--mkfs** option:

```
-N num_inodes
```

Alternately, if you know the average file size, then you can specify the OST inode count for the OST file systems using:

```
-i average_file_size / (number_of_stripes * 4)
```

For example, if the average file size is 16 MB and there are, by default 4 stripes per file, then **--mkfsoptions='-i 1048576'** would be appropriate.

Note

In addition to the number of inodes, file system check time on OSTs is affected by a number of other variables: size of the file system, number of allocated blocks, distribution of allocated blocks on the disk, disk speed, CPU speed, and amount of RAM on the server. Reasonable file system check times (without serious file system problems), are expected to take five and thirty minutes per TB.

For more details on formatting MDT and OST file systems, see Section 6.4, " Formatting Options for RAID Devices".

5.3.4. File and File System Limits

Table 5.2 "File and file system limits" describes file and file system size limits. These limits are imposed by either the intel®