



Installing Lustre 2.7 via RPM

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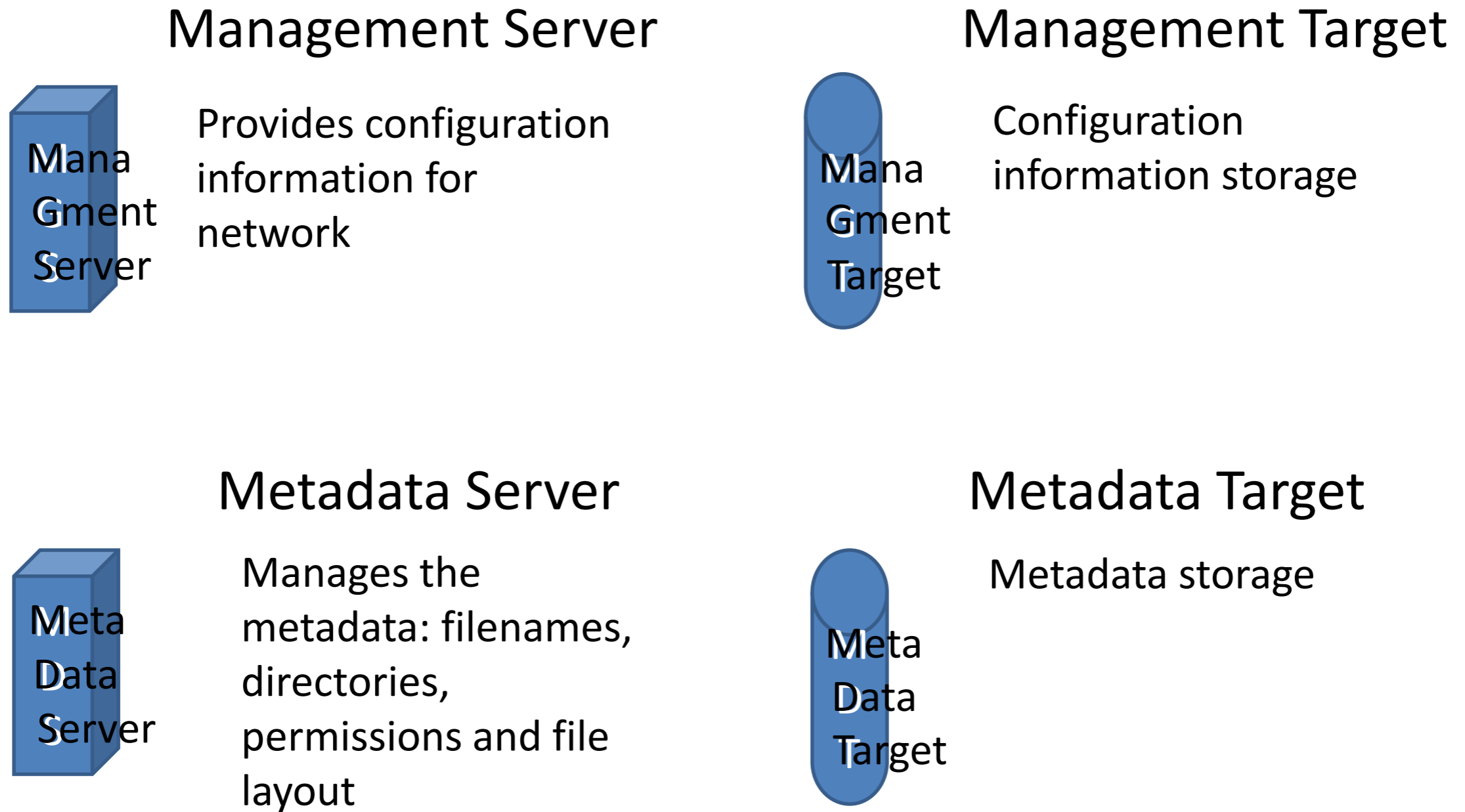
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Overall Outline

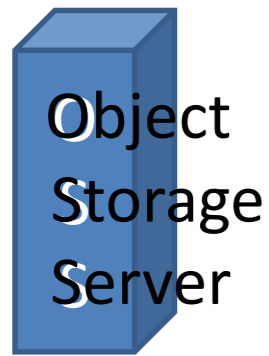
- Lustre components
- Environment
- Software
- Installing servers
 - MGS/MDS
 - OSSs
- Installing clients
- Verification

Lustre components



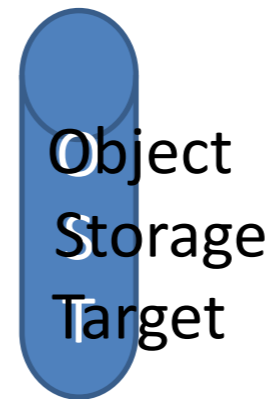
Lustre components

Object Storage Server

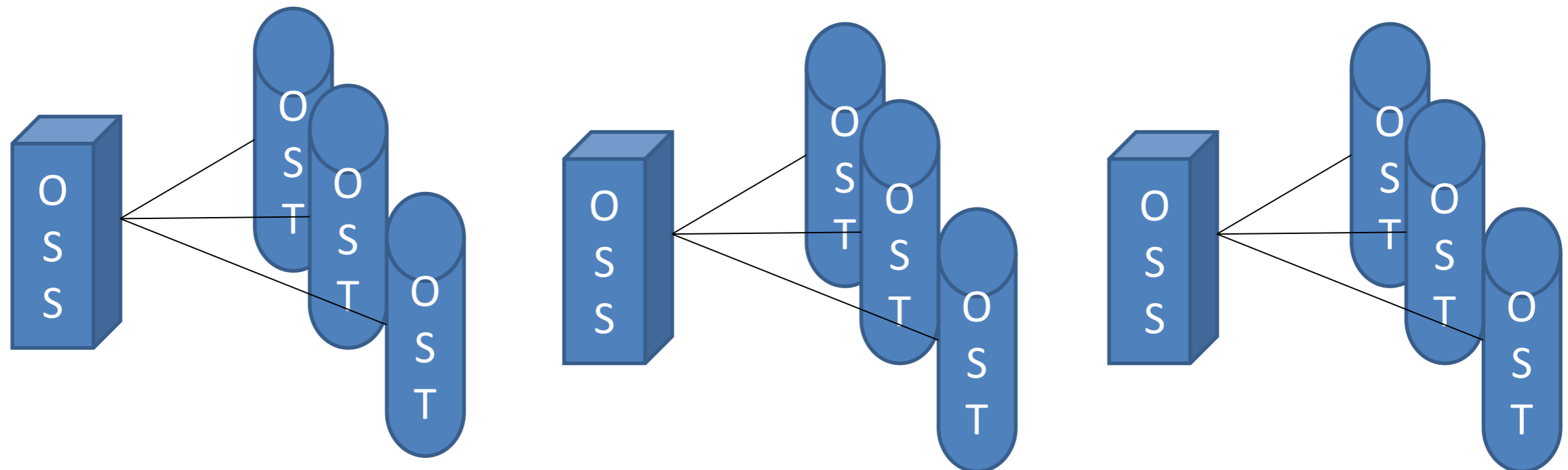


Handles network requests and provides file I/O service for one or more local OSTs

Object Storage Target



Stores file data



Demonstration Environment (not for production)

Professional Driver on Closed Course

Oracle VirtualBox “Hardware”

- All systems:

- 1 CPU, 1GB RAM, 1 8GB primary disk

- Servers (additional disks)

- 1 MGS/OSS

- 1 combined MGS/MDT (1GB)
- 1 OST (5GB)

- 1 OSS (10.1.1.11)

- 1 OST (5GB)

- IP Addresses

- MGS/MDS/OSS0: 10.1.1.10

- **NOTE: You would never put OSS and MDS on same server in production.**

- OSS1: 10.1.1.11

- CLIENTS: 10.1.1.100, 10.1.1.101

Assumptions

- This will be a CentOS install
 - using RedHat-style approach

- All systems:

- CentOS 6.6 minimal install
- SELINUX=disabled
- Firewall/IPTables=disabled

Download e2fsprogs

- e2fsprogs:
 - stands for ext2 file system programs
 - https://downloads.hpdd.intel.com/public/e2fsprogs/latest/el6/RPMS/x86_64/
 - e2fsprogs-1.42.12.wc1-7.el6.x86_64.rpm
 - e2fsprogs-libs-1.42.12.wc1-7.el6.x86_64.rpm

e2fsprogs Download Commands

```
wget https://downloads.hpdd.intel.com/public/e2fsprogs/latest/el6/RPMS/x86_64/e2fsprogs-1.42.12.wc1-7.el6.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/e2fsprogs/latest/el6/RPMS/x86_64/e2fsprogs-libs-1.42.12.wc1-7.el6.x86_64.rpm
```

Download Server RPMs

- lustre RPMs:
 - <https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6/>
 - Server:
 - kernel-2.6.32-504.8.1.el6_lustre.x86_64.rpm
 - kernel-firmware-2.6.32-504.8.1.el6_lustre.x86_64.rpm
 - libcom_err-1.42.12.wc1-7.el6.x86_64.rpm
 - libss-1.42.12.wc1-7.el6.x86_64.rpm
 - lustre-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
 - lustre-modules-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
 - lustre-osd-ldiskfs-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
 - lustre-osd-ldiskfs-mount-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm

Server Download Commands

```
wget https://downloads.hpdd.intel.com/public/e2fsprogs/latest/el6/RPMS/x86_64/libcom_err-1.42.12.wc1-7.el6.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/e2fsprogs/latest/el6/RPMS/x86_64/libss-1.42.12.wc1-7.el6.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/server/RPMS/x86_64/kernel-2.6.32-504.8.1.el6_lustre.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/server/RPMS/x86_64/lustre-modules-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/server/RPMS/x86_64/kernel-firmware-2.6.32-504.8.1.el6_lustre.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/server/RPMS/x86_64/lustre-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/server/RPMS/x86_64/lustre-osd-lldiskfs-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/server/RPMS/x86_64/lustre-osd-lldiskfs-mount-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```


Download Client RPMs

- Client:
 - lustre-client-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm
 - lustre-client-modules-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm

Client Download Commands

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/client/RPMS/x86_64/lustre-client-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm
```

```
wget https://downloads.hpdd.intel.com/public/lustre/lustre-2.7.0/el6.6/client/RPMS/x86_64/lustre-client-modules-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm
```

Servers: Packages

- Disable kernel and lustre yum updates
 - echo 'disable=kern*,lustre*' >>/etc/yum.conf
- Install kernel-firmware package
 - Use rpm to ensure the _lustre version is installed
 - rpm -Uvh kernel-firmware-2.6.32-504.8.1.el6_lustre.x86_64.rpm
- Install lustre packages
 - kernel-2.6.32-504.8.1.el6_lustre.x86_64.rpm
 - lustre-modules-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64
 - libss-1.42.12.wc1-7.el6.x86_64.rpm
 - libcom_err-1.42.12.wc1-7.el6.x86_64.rpm
 - e2fsprogs-1.42.12.wc1-7.el6.x86_64.rpm
 - e2fsprogs-libs-1.42.12.wc1-7.el6.x86_64.rpm
 - lustre-osd-ldiskfs-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
 - lustre-osd-ldiskfs-mount-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
 - lustre-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm

Server Package Install Commands

- Perform an yum install on all remaining packages

```
yum install kernel-2.6.32-504.8.1.el6_lustre.x86_64.rpm
```

```
yum install lustre-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
yum install lustre-modules-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
yum install lustre-osd-lldiskfs-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
yum install lustre-osd-lldiskfsmount-2.7.0-2.6.32_504.8.1.el6_lustre.x86_64.x86_64.rpm
```

```
yum install e2fsprogs-1.42.12.wc1-7.el6.x86_64.rpm
```

```
yum install e2fsprogs-libs-1.42.12.wc1-7.el6.x86_64.rpm
```

```
yum install libcom_err-1.42.12.wc1-7.el6.x86_64.rpm
```

```
yum install libss-1.42.12.wc1-7.el6.x86_64.rpm
```

Servers: configure LNET

- Configure kernel module for tcp network:
 - echo “options Inet networks=tcp”> /etc/modprobe.d/inet.conf
- Configure services to automatically start
 - chkconfig Inet --add
 - chkconfig Inet on
 - chkconfig lustre --add
 - chkconfig lustre on
- reboot
 - Because we have added a new kernel which needs loaded

Server: Setup filesystem

- On MGS:
 - Create combined MGS/MDT

```
mkfs.lustre --fsname=DATA --mgs --mdt /dev/sda
```

 - **Note:** use '*--reformat*' if disk has previously been formatted
- On all OSSes:
 - Create an OST (X=which OST we are formatting)

```
mkfs.lustre --fsname=DATA --ost \  
--mgsgroup=10.1.1.10 --index=X /dev/sdb
```

 - **Note:** use '*--reformat*' if disk has previously been formatted

Server: Setup /etc/ldev.conf

Format:

local foreign/- label [md:|zfs:]device-path [journal-path]/- [raidtab]

local hostname

The name of the host where the device normally runs.

foreign hostname

The name of the host where the device runs when failed over.

If failover is not used, insert a hyphen as a placeholder.

label

The Lustre label associated with the device in the form fsname-SRVnnnn where fsname is the file system name, SRV is OST or MDT, and nnnn is the four-digit hex index of the device.

Path

The path name of the device.

In failover configurations it should be available on both local and foreign hosts (eg: the symlinks maintained by udev in /dev/disk/by-id)

Server: Setup /etc/ldev.conf

Not for us today

Format:

local foreign/- label  [md:|zfs:]device-path [journal-path]/- [raidtab]

Our /etc/ldev.conf file:

```
#local foreign/- label [md:|zfs:]device-path [journal-path]/- [raidtab]
lustre01 - DATA-MDT0000 /dev/sda
lustre01 - DATA-OST0000 /dev/sdb
lustre02 - DATA-OST0001 /dev/sda
```

Load lustre:
service lustre start

TADA!

- We now have a working lustre filesystem!

All that is left is to setup a client to
connect and use it!

Let's do that now...

Clients

- Ensure proper kernel is installed:
`yum install kernel-2.6.32-504.8.1.el6`
- Install client packages
 - `lustre-client-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm`
 - `lustre-client-modules-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm`

```
yum install lustre-client-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm
```

```
yum install lustre-client-modules-2.7.0-2.6.32_504.8.1.el6.x86_64.x86_64.rpm
```

- Add mount to `/etc/fstab`:
 - `lustre-mgs@tcp:/DATA/data lustre defaults,_netdev 0 0`
- reboot
 - Because we have added a new kernel which needs loaded

Quick Checks

- Log into client
 - Is /data mounted?
 - Copy files to /data
- Log into second client
 - Mount filesystem
 - Are copied files available?

Thank You for Your Time and Attention

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