

**RED HAT
SUMMIT**

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RED HAT STORAGE FOR MERE MORTALS

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AGENDA

AGENDA

- What is Red Hat Storage?
- History
- Community
- Architecture
- Node Installation
- Installing RHS
- Adding servers to the trusted pool
- Distributed volumes
- Replicated volumes
- Distributed + replicated volumes

AGENDA

- Attaching to Red Hat Storage with NFS

WHAT IS RED HAT STORAGE?

WHAT IS RED HAT STORAGE

- Red Hat Storage is a commercially supported distribution of GlusterFS
- GlusterFS is a scale-out network-attached storage filesystem which uses commodity x86 hardware and inexpensive disks, JBODs, or (rarely) SAN
- It can use ethernet or InfiniBand RDMA for transport

HISTORY

HISTORY

- The company Gluster was founded in 2005 by founder and CTO Anand Babu Periasamy (now an angel investor in Silicon Valley)
- In 2010, Ben Golub (now CEO of Docker) became the CEO
- In 2011, Red Hat acquired Gluster
- In 2012, Red Hat Storage was launched

COMMUNITY

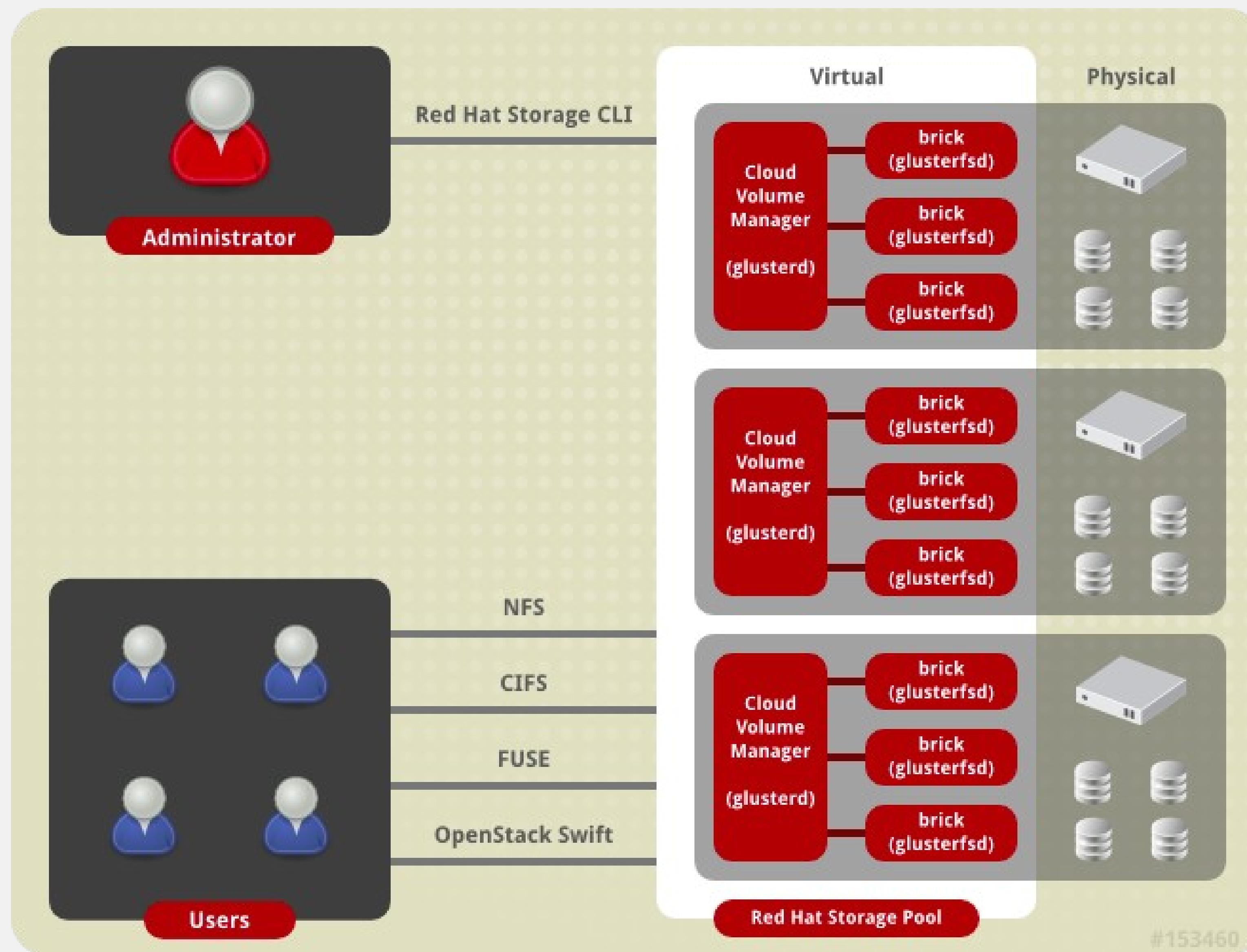
COMMUNITY

- As Fedora is the upstream project from which Red Hat uses technologies to build Red Hat Enterprise Linux, the Gluster Project (www.gluster.org) is the upstream for Red Hat Storage.
- Documentation, IRC channels, development tools and docs, etc. are all there for the community.
- Community governance with Red Hat's sponsorship.

ARCHITECTURE

ARCHITECTURE

- Server component (glusterfsd)
- Client component (glusterfs)
- The client runs in user space (FUSE)
- File location determined by a hashing algorithm - no metadata services
 - No SPOF
- Global namespace

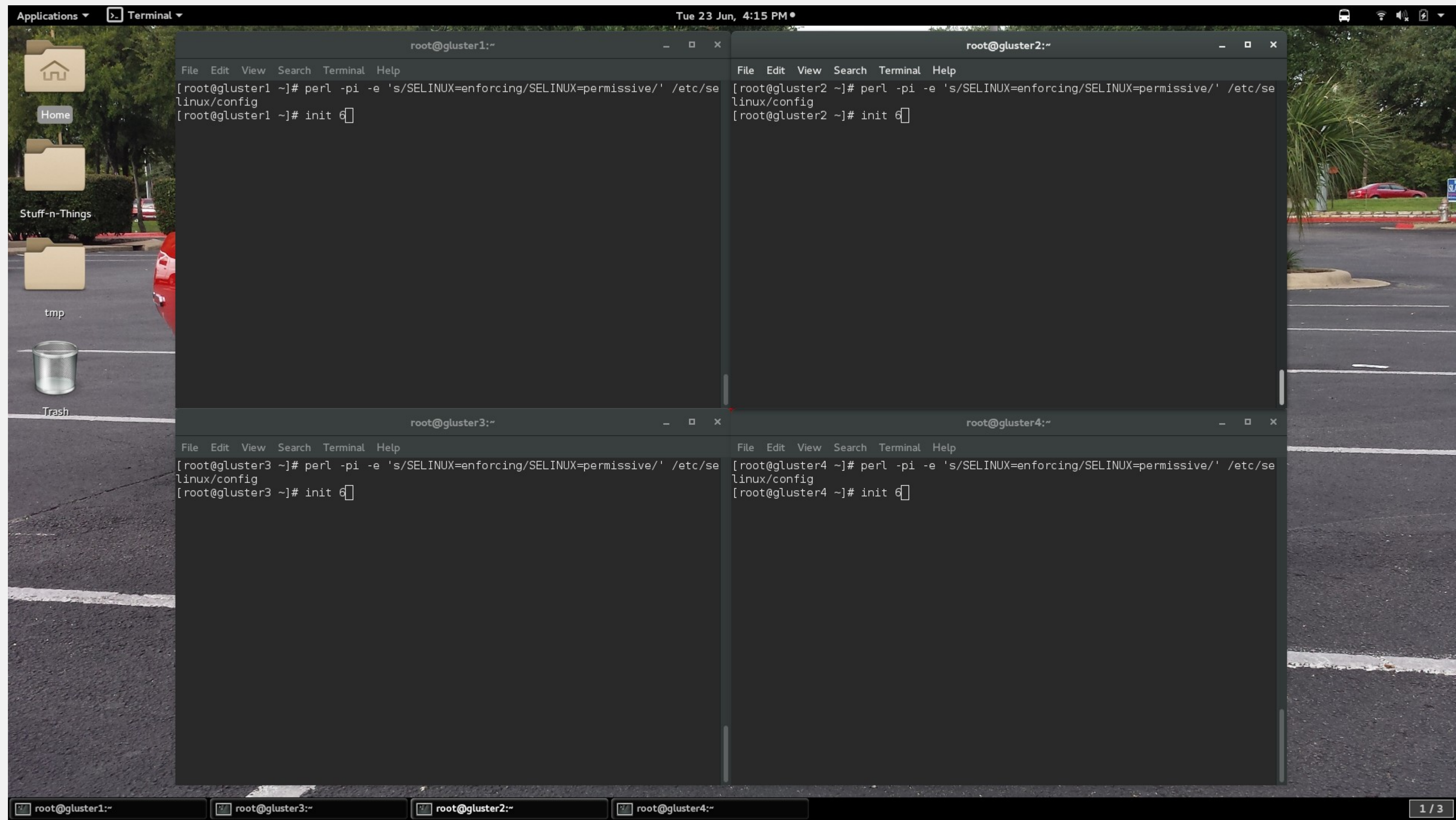


NODE INSTALLATION

NODE INSTALLATION

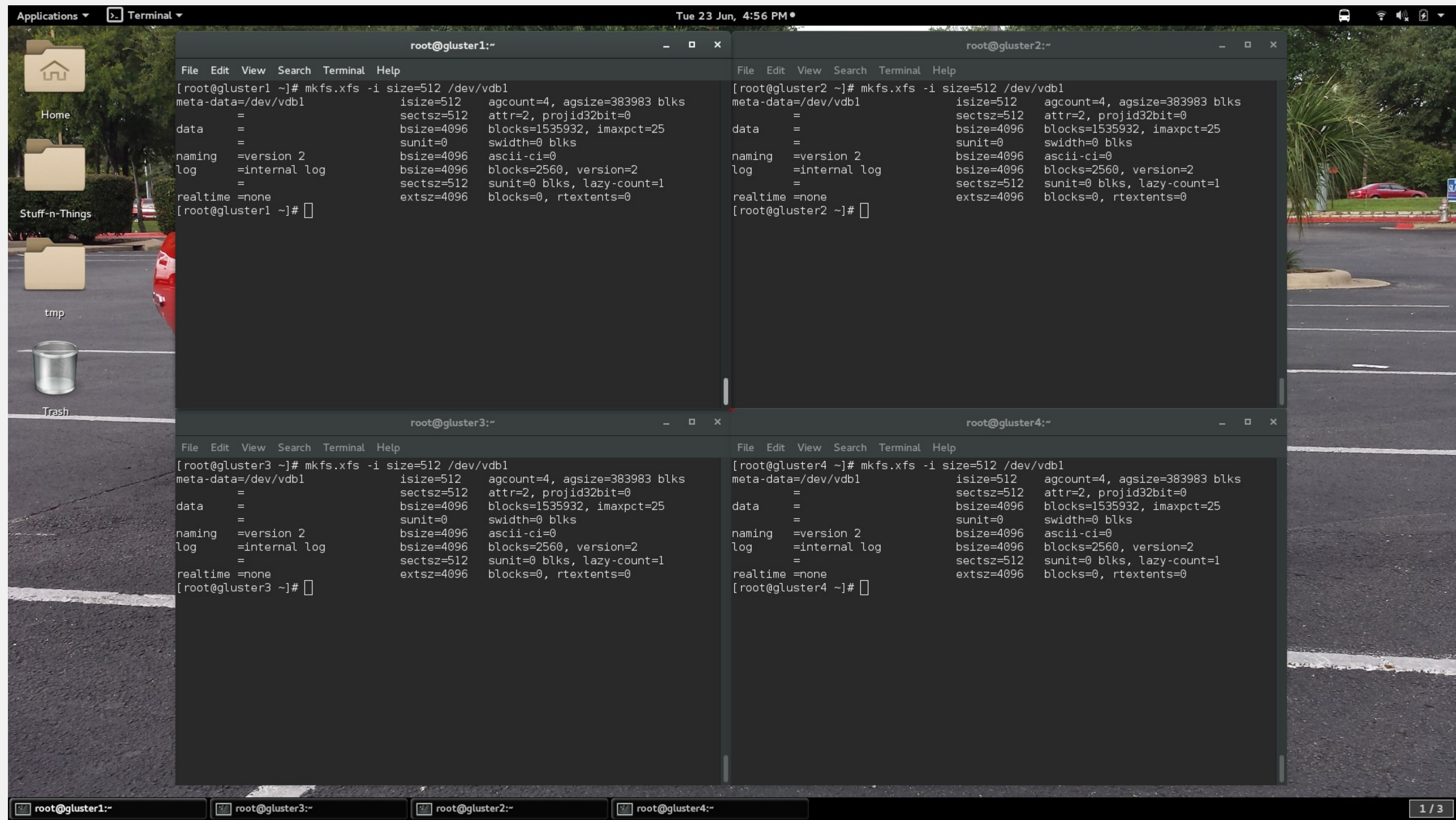
```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# chkconfig iptables off; service iptables stop  
iptables: Setting chains to policy ACCEPT: filter [ OK ]  
iptables: Flushing firewall rules: [ OK ]  
iptables: Unloading modules: [ OK ]  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# perl -pi -e 's/SELINUX=enforcing/SELINUX=permissive/' /etc/se  
linux/config  
[root@gluster1 ~]# init 6
```

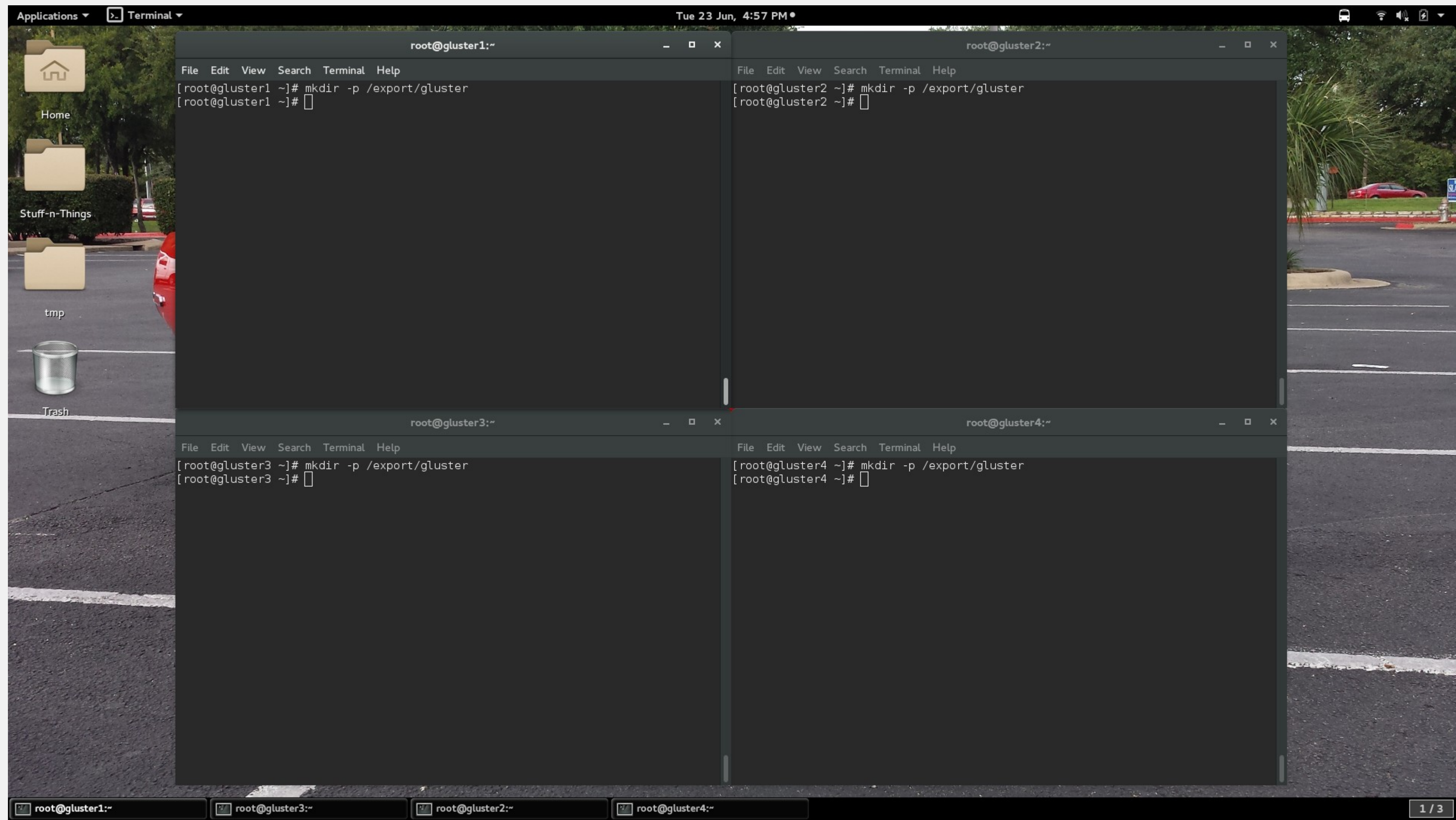


```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# fdisk /dev/vdb  
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel  
Building a new DOS disklabel with disk identifier 0x66e2aa02.  
Changes will remain in memory only, until you decide to write them.  
After that, of course, the previous content won't be recoverable.  
  
Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)  
  
WARNING: DOS-compatible mode is deprecated. It's strongly recommended to  
switch off the mode (command 'c') and change display units to  
sectors (command 'u').  
  
Command (m for help): n  
Command action  
   e   extended  
   p   primary partition (1-4)  
p  
Partition number (1-4): 1  
First cylinder (1-12190, default 1):  
Using default value 1  
Last cylinder, +cylinders or +size{K,M,G} (1-12190, default 12190):  
Using default value 12190  
  
Command (m for help): w  
The partition table has been altered!  
  
Calling ioctl() to re-read partition table.  
Syncing disks.  
[root@gluster1 ~]#
```

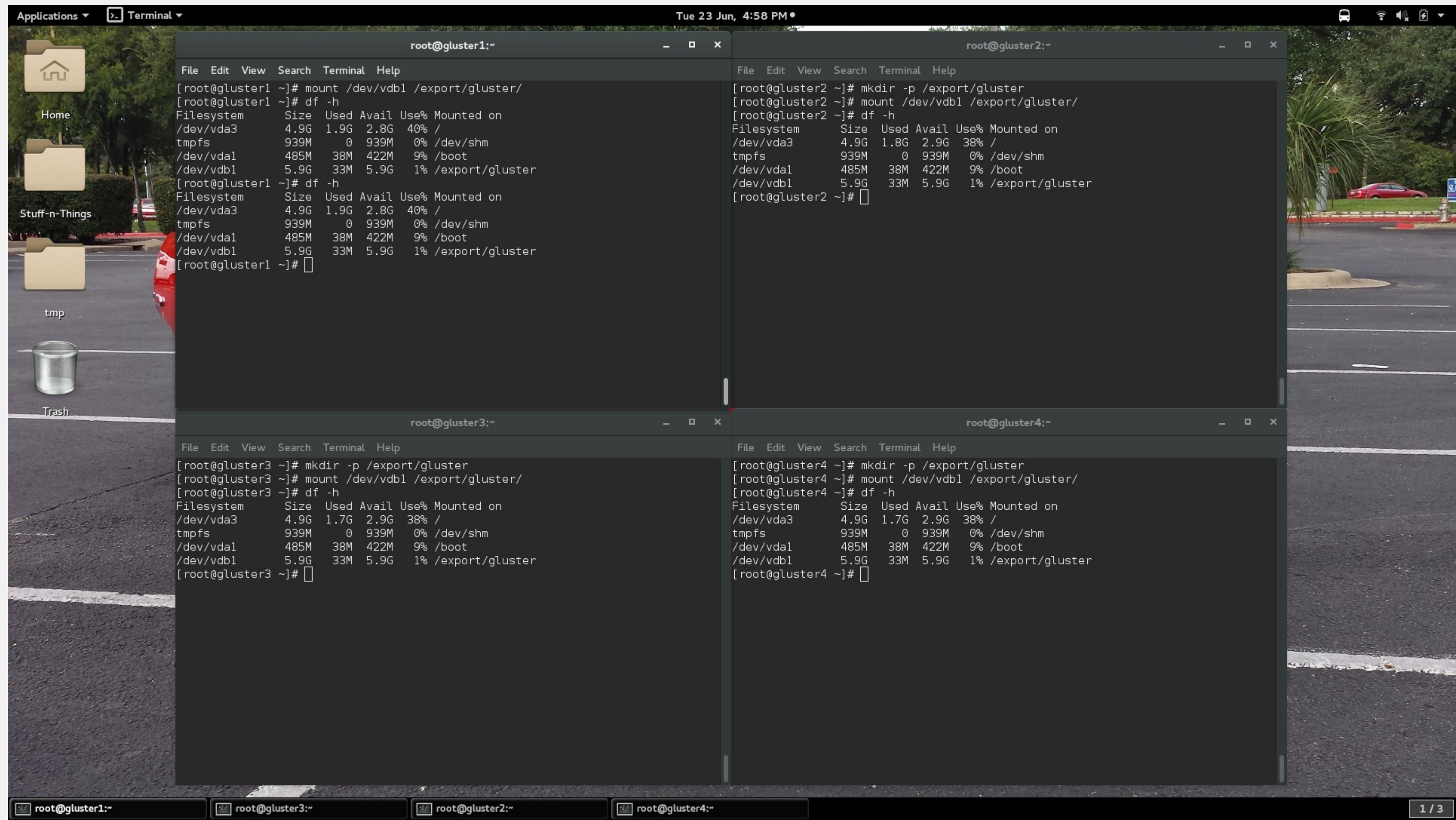
```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# mkfs.xfs -i size=512 /dev/vdb1  
meta-data=/dev/vdb1          isize=512    agcount=4, agsize=383983 blks  
                =           sectsz=512   attr=2, projid32bit=0  
data        =           bsize=4096    blocks=1535932, imaxpct=25  
                =           sunit=0     swidth=0 blks  
naming      =version 2      bsize=4096    ascii-ci=0  
log         =internal log   bsize=4096    blocks=2560, version=2  
                =           sectsz=512   sunit=0 blks, lazy-count=1  
realtime    =none          extsz=4096    blocks=0, rtextents=0  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# mkdir -p /export/gluster  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# mount /dev/vdb1 /export/gluster/  
[root@gluster1 ~]# df -h  
Filesystem      Size  Used Avail Use% Mounted on  
/dev/vda3       4.9G  1.9G  2.8G  40% /  
tmpfs           939M   0  939M   0% /dev/shm  
/dev/vda1       485M   38M  422M   9% /boot  
/dev/vdb1       5.9G   33M  5.9G   1% /export/gluster  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# tail -1 /etc/mtab  
/dev/vdb1 /export/gluster xfs rw 0 0  
[root@gluster1 ~]# tail -1 /etc/mtab >> /etc/fstab  
[root@gluster1 ~]# cat /etc/fstab  
  
#  
# /etc/fstab  
# Created by anaconda on Tue Jun 23 11:30:07 2015  
#  
# Accessible filesystems, by reference, are maintained under '/dev/disk'  
# See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info  
#  
UUID=85038fff-346c-4ee7-a20e-2b9470fbafef / ext4 default  
ts 1 1  
UUID=3d7199f3-ae26-48fc-9c34-35e54e1c6f0f /boot ext4 default  
ts 1 2  
UUID=42a56342-01ec-44f4-80d3-78cd889640e4 swap swap default  
ts 0 0  
tmpfs /dev/shm tmpfs defaults 0 0  
devpts /dev/pts devpts gid=5,mode=620 0 0  
sysfs /sys sysfs defaults 0 0  
proc /proc proc defaults 0 0  
/dev/vdb1 /export/gluster xfs rw 0 0  
[root@gluster1 ~]#
```

Applications

Terminal

Tue 23 Jun, 4:58 PM

root@gluster1:~

File Edit View Search Terminal Help

[root@gluster1 ~]# tail -1 /etc/mtab
/dev/vdb1 /export/gluster xfs rw 0 0
[root@gluster1 ~]# tail -1 /etc/mtab >> /etc/fstab
[root@gluster1 ~]# cat /etc/fstab

/etc/fstab
Created by anaconda on Tue Jun 23 11:30:07 2015

Accessible filesystems, by reference, are maintained under '/dev/disk'
See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

UUID=85038fff-346c-4ee7-a20e-2b9470fbafef / ext4 default
ts 1 1
UUID=3d7199f3-ae26-48fc-9c34-35e54e1c6f0f /boot ext4 default
ts 1 2
UUID=42a56342-01ec-44f4-80d3-78cd889640e4 swap swap default
ts 0 0
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
/dev/vdb1 /export/gluster xfs rw 0 0
[root@gluster1 ~]#

root@gluster2:~

File Edit View Search Terminal Help

[root@gluster2 ~]# tail -1 /etc/mtab >> /etc/fstab
[root@gluster2 ~]# cat /etc/fstab

/etc/fstab
Created by anaconda on Tue Jun 23 11:38:03 2015

Accessible filesystems, by reference, are maintained under '/dev/disk'
See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

UUID=2d38ee88-7f7d-4102-bbd7-0a8d689abd09 / ext4 default
ts 1 1
UUID=2cd661ab-af31-4daf-ad49-0f1f50388d31 /boot ext4 default
ts 1 2
UUID=f21dffb9-1cf5-4e1f-8902-dae6c83d5901 swap swap default
ts 0 0
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
/dev/vdb1 /export/gluster xfs rw 0 0
[root@gluster2 ~]#

root@gluster3:~

File Edit View Search Terminal Help

[root@gluster3 ~]# tail -1 /etc/mtab >> /etc/fstab
[root@gluster3 ~]# cat /etc/fstab

/etc/fstab
Created by anaconda on Tue Jun 23 11:44:02 2015

Accessible filesystems, by reference, are maintained under '/dev/disk'
See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

UUID=3b5cf3a5-6847-4f58-9586-a78fa42c5152 / ext4 default
ts 1 1
UUID=f0f23107-0cf3-4eb9-b8bb-4becd56233be /boot ext4 default
ts 1 2
UUID=e8d245ff-8a48-4478-b7c0-6098ab62048c swap swap default
ts 0 0
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
/dev/vdb1 /export/gluster xfs rw 0 0
[root@gluster3 ~]#

root@gluster4:~

File Edit View Search Terminal Help

[root@gluster4 ~]# tail -1 /etc/mtab >> /etc/fstab
[root@gluster4 ~]# cat /etc/fstab

/etc/fstab
Created by anaconda on Tue Jun 23 13:03:53 2015

Accessible filesystems, by reference, are maintained under '/dev/disk'
See man pages fstab(5), findfs(8), mount(8) and/or blkid(8) for more info

UUID=a7690033-b762-44af-8248-cc3588118b6e / ext4 default
ts 1 1
UUID=7b5cad1c-b843-4316-bf15-38db64a3fa91 /boot ext4 default
ts 1 2
UUID=15a86f55-e312-4d83-8185-bad57d0d9ab5 swap swap default
ts 0 0
tmpfs /dev/shm tmpfs defaults 0 0
devpts /dev/pts devpts gid=5,mode=620 0 0
sysfs /sys sysfs defaults 0 0
proc /proc proc defaults 0 0
/dev/vdb1 /export/gluster xfs rw 0 0
[root@gluster4 ~]#

root@gluster1:~

root@gluster3:~

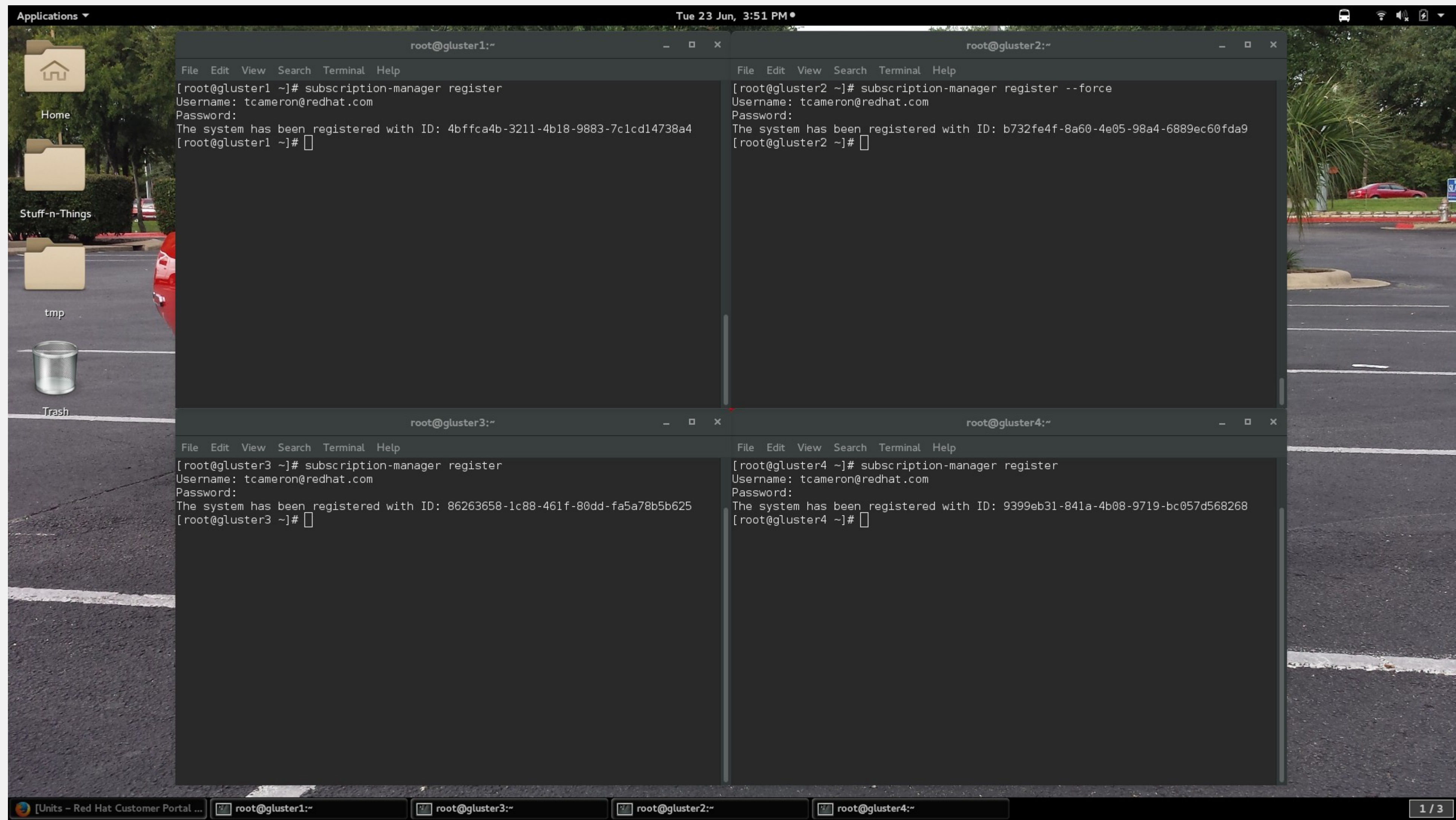
root@gluster2:~

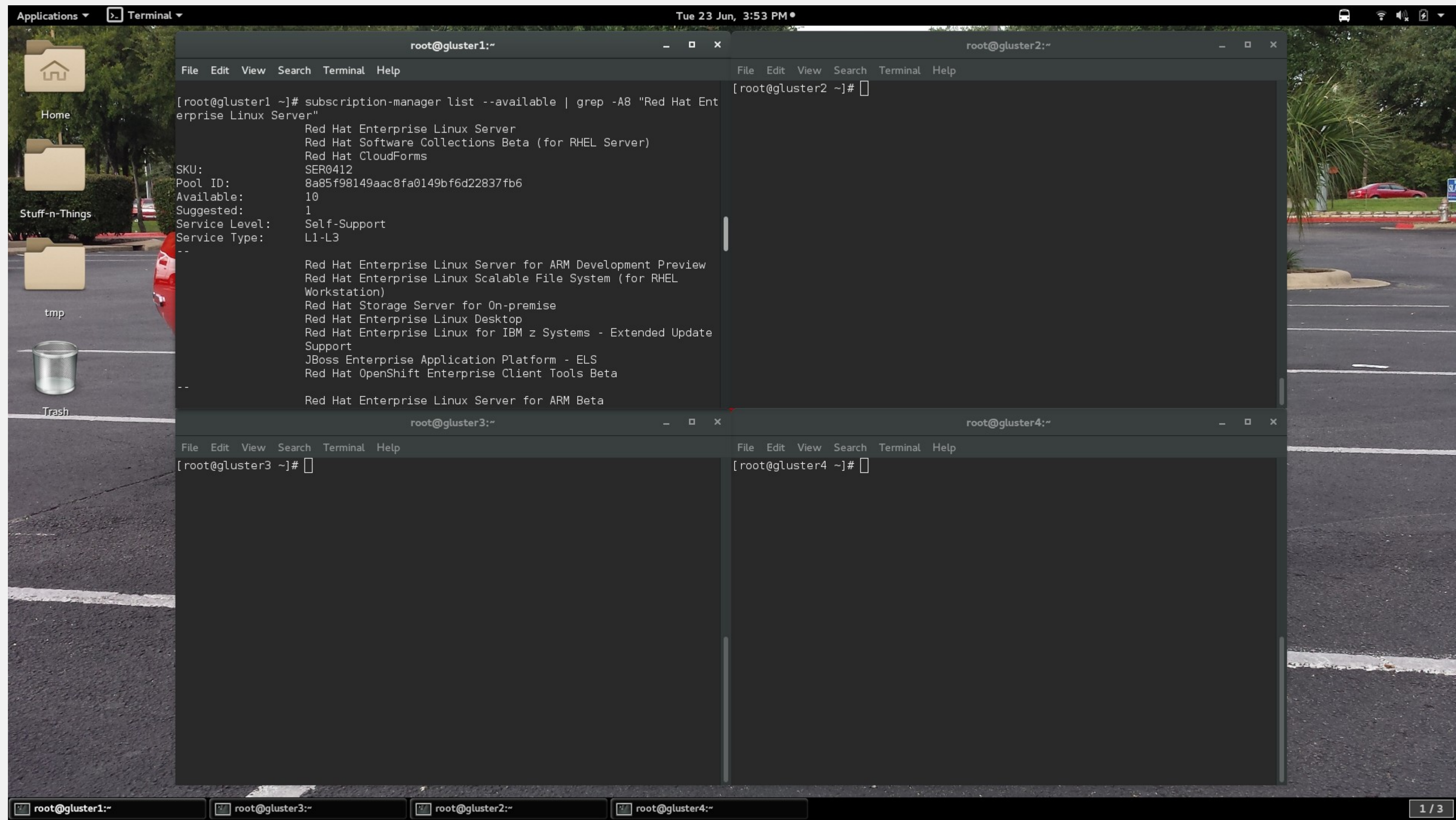
root@gluster4:~

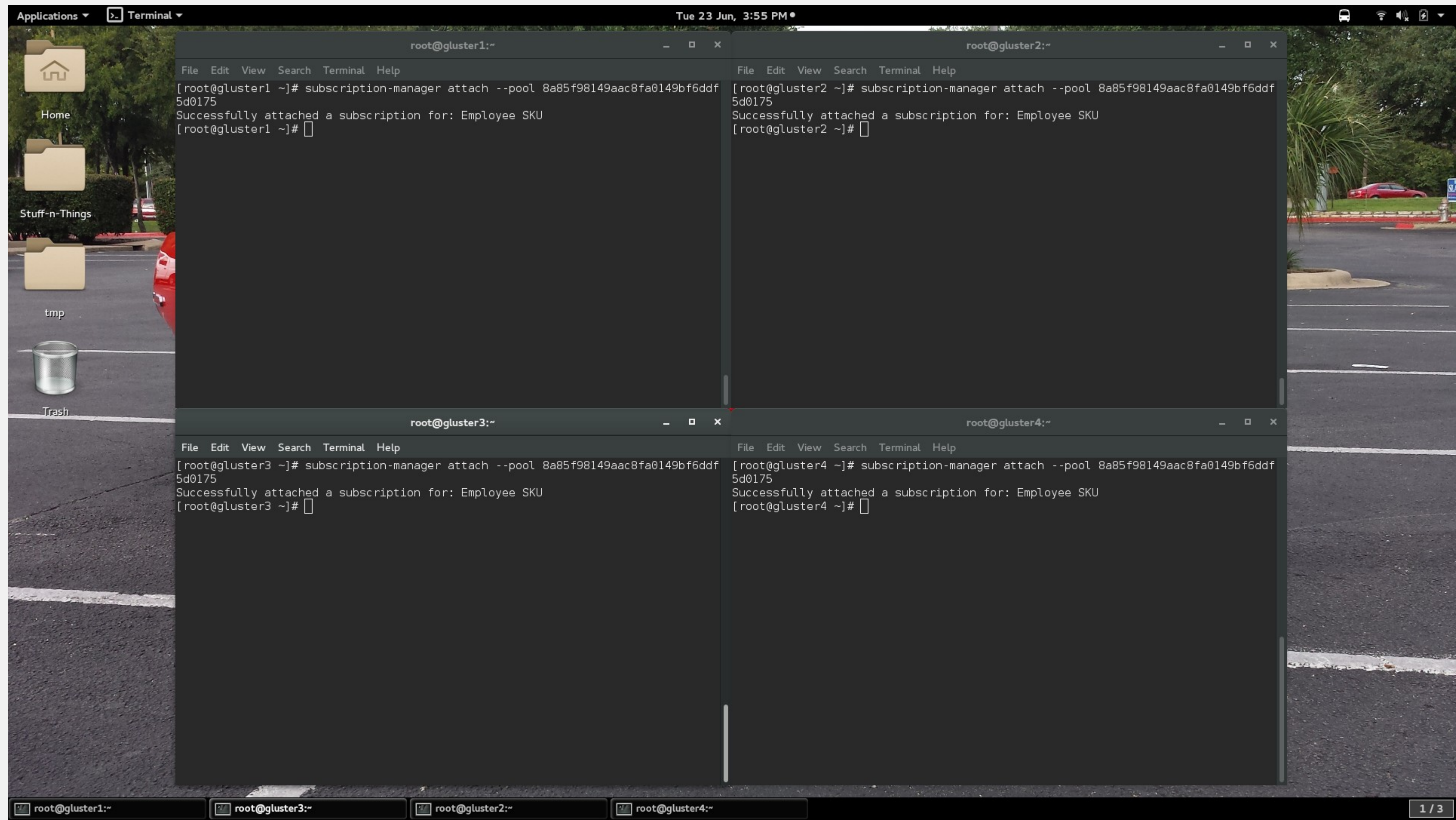
1 / 3

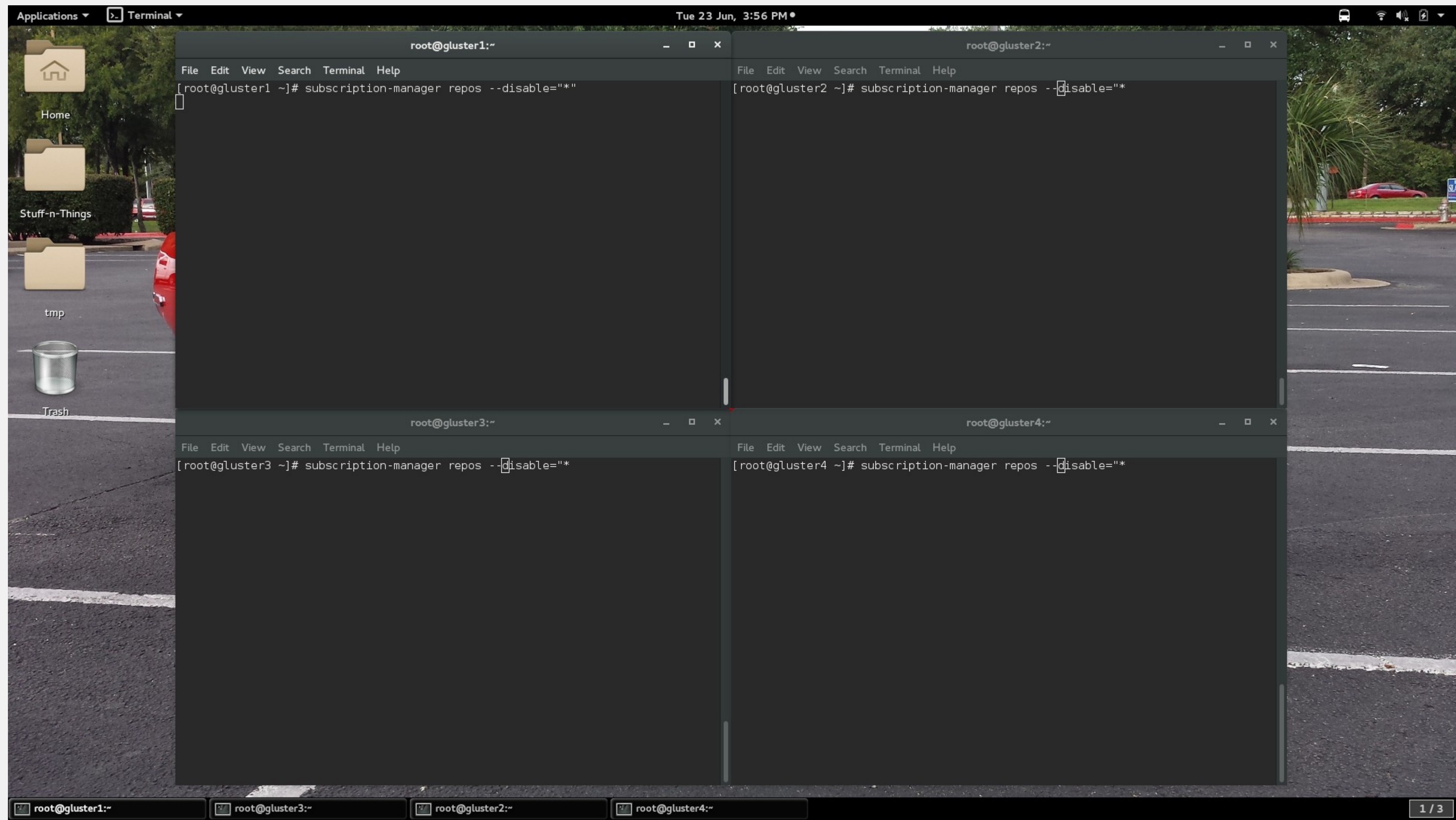
#redhat #rhsummit

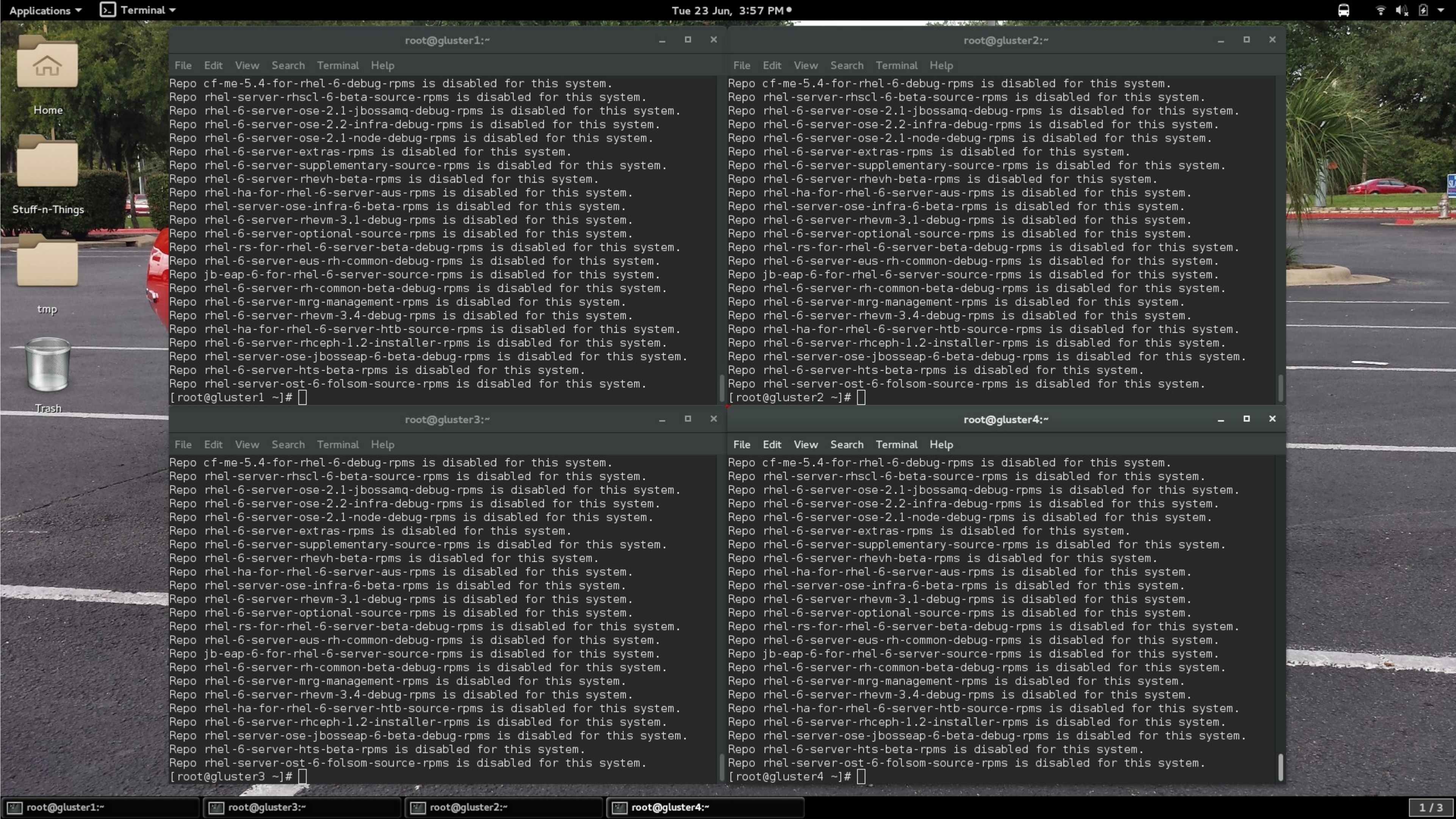




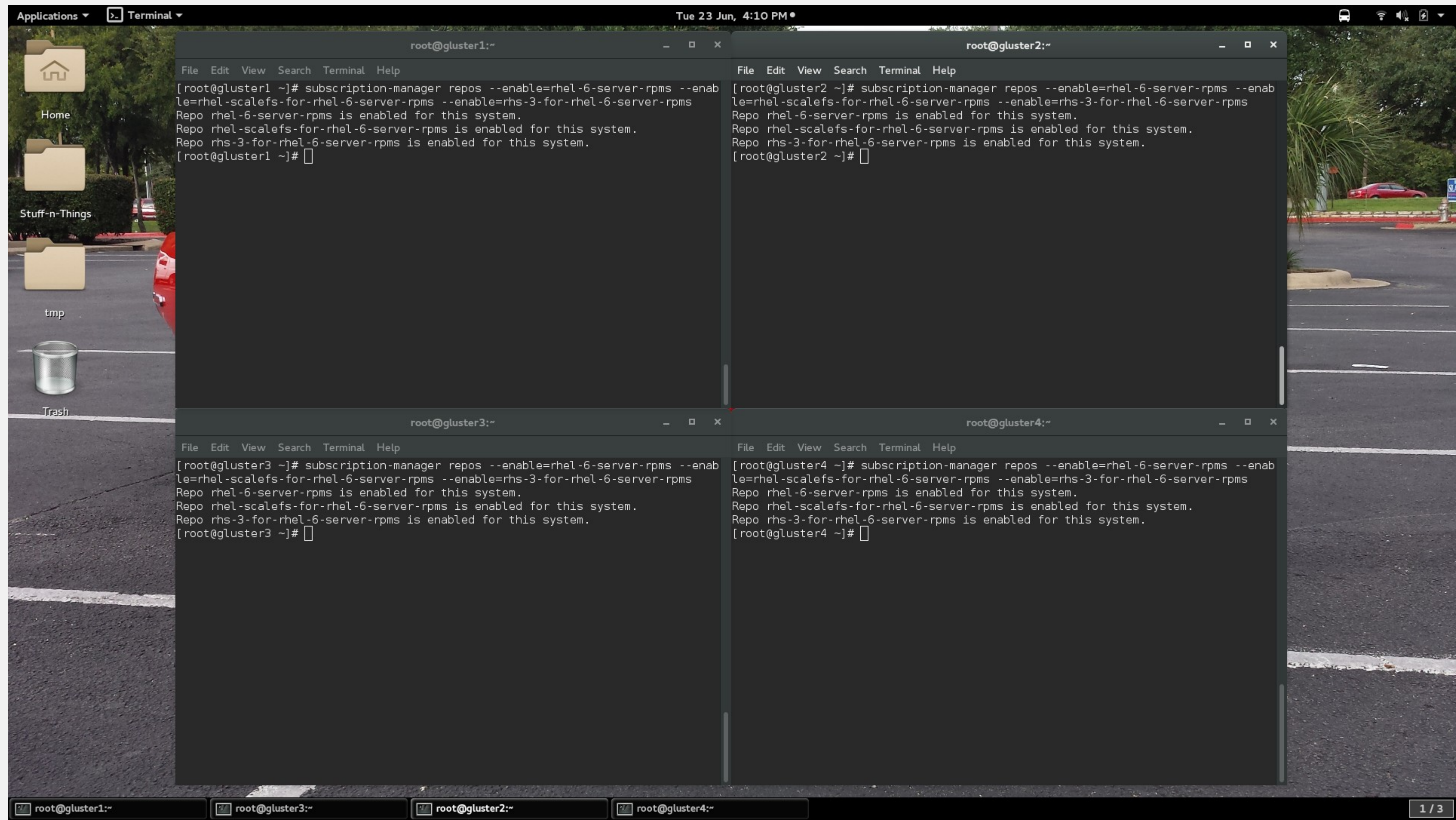








```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# subscription-manager repos --enable=rhel-6-server-rpms --enable=rhel-scalefs-for-rhel-6-server-rpms --enable=rhs-3-for-rhel-6-server-rpms  
Repo rhel-6-server-rpms is enabled for this system.  
Repo rhel-scalefs-for-rhel-6-server-rpms is enabled for this system.  
Repo rhs-3-for-rhel-6-server-rpms is enabled for this system.  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# yum install redhat-storage-server  
Loaded plugins: product-id, security, subscription-manager  
This system is receiving updates from Red Hat Subscription Management.  
█
```

```
root@gluster1:~
File Edit View Search Terminal Help
audit-libs          x86_64 2.3.7-5.el6          rhel-6-server-rpms      71 k
cyrus-sasl           x86_64 2.1.23-15.el6_6.2     rhel-6-server-rpms      78 k
cyrus-sasl-lib       x86_64 2.1.23-15.el6_6.2     rhel-6-server-rpms     136 k
cyrus-sasl-plain     x86_64 2.1.23-15.el6_6.2     rhel-6-server-rpms      31 k
file                 x86_64 5.04-21.el6           rhel-6-server-rpms      47 k
file-libs            x86_64 5.04-21.el6           rhel-6-server-rpms     313 k
gnutls               x86_64 2.8.5-14.el6_5        rhel-6-server-rpms     346 k
keyutils-libs        x86_64 1.4-5.el6             rhel-6-server-rpms      20 k
kpartx              x86_64 0.4.9-80.el6_6.3      rhel-6-server-rpms      63 k
libX11               x86_64 1.6.0-2.2.el6         rhel-6-server-rpms     586 k
libX11-common        noarch 1.6.0-2.2.el6         rhel-6-server-rpms     192 k
libselinux           x86_64 2.0.94-5.8.el6        rhel-6-server-rpms     109 k
libselinux-utils     x86_64 2.0.94-5.8.el6        rhel-6-server-rpms      82 k
policycoreutils      x86_64 2.0.83-19.47.el6_6.1
sg3_utils-libs       x86_64 1.28-6.el6            rhel-6-server-rpms     680 k
                    rhel-6-server-rpms      52 k

Transaction Summary
=====
Install      179 Package(s)
Upgrade      16 Package(s)

Total download size: 122 M
Is this ok [y/N]:
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
Dependency Updated:  
  audit.x86_64 0:2.3.7-5.el6  
  audit-libs.x86_64 0:2.3.7-5.el6  
  cyrus-sasl.x86_64 0:2.1.23-15.el6_6.2  
  cyrus-sasl-lib.x86_64 0:2.1.23-15.el6_6.2  
  cyrus-sasl-plain.x86_64 0:2.1.23-15.el6_6.2  
  file.x86_64 0:5.04-21.el6  
  file-libs.x86_64 0:5.04-21.el6  
  gnutls.x86_64 0:2.8.5-14.el6_5  
  keyutils-libs.x86_64 0:1.4-5.el6  
  kpartx.x86_64 0:0.4.9-80.el6_6.3  
  libX11.x86_64 0:1.6.0-2.2.el6  
  libX11-common.noarch 0:1.6.0-2.2.el6  
  libselinux.x86_64 0:2.0.94-5.8.el6  
  libselinux-utils.x86_64 0:2.0.94-5.8.el6  
  policycoreutils.x86_64 0:2.0.83-19.47.el6_6.1  
  sg3_utils-libs.x86_64 0:1.28-6.el6  
  
Replaced:  
  redhat-logos.noarch 0:60.0.14-1.el6  
  
Complete!  
[root@gluster1 ~]#
```

Applications

Terminal

Home

Stuff-n-Things

tmp

Trash

root@gluster1:~

File Edit View Search Terminal Help

Dependency Updated:
audit.x86_64 0:2.3.7-5.el6
audit-libs.x86_64 0:2.3.7-5.el6
cyrus-sasl.x86_64 0:2.1.23-15.el6_6.2
cyrus-sasl-lib.x86_64 0:2.1.23-15.el6_6.2
cyrus-sasl-plain.x86_64 0:2.1.23-15.el6_6.2
file.x86_64 0:5.04-21.el6
file-libs.x86_64 0:5.04-21.el6
gnutls.x86_64 0:2.8.5-14.el6_5
keyutils-libs.x86_64 0:1.4-5.el6
kpartx.x86_64 0:0.4.9-80.el6_6.3
libX11.x86_64 0:1.6.0-2.2.el6
libX11-common.noarch 0:1.6.0-2.2.el6
libselinux.x86_64 0:2.0.94-5.8.el6
libselinux-utils.x86_64 0:2.0.94-5.8.el6
policycoreutils.x86_64 0:2.0.83-19.47.el6_6.1
sg3_utils-libs.x86_64 0:1.28-6.el6

Replaced:
redhat-logos.noarch 0:60.0.14-1.el6

Complete!
[root@gluster1 ~]# yum install redhat-storage-server

root@gluster3:~

File Edit View Search Terminal Help

Downloading Packages:
warning: rpmts_HdrFromFdno: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOK EY
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Importing GPG key 0xFD431D51:
Userid : Red Hat, Inc. (release key 2) <security@redhat.com>
Package: redhat-release-server-6Server-6.5.0.1.el6.x86_64 (@anaconda-RedHatEnte
rpriseLinux-201311111358.x86_64/6.5)
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Importing GPG key 0x2FA658E0:
Userid : Red Hat, Inc. (auxiliary key) <security@redhat.com>
Package: redhat-release-server-6Server-6.5.0.1.el6.x86_64 (@anaconda-RedHatEnte
rpriseLinux-201311111358.x86_64/6.5)
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
Updating : cyrus-sasl-lib-2.1.23-15.el6_6.2.x86_64 1/212
Updating : libselinux-2.0.94-5.8.el6.x86_64 2/212
Updating : audit-libs-2.3.7-5.el6.x86_64 3/212
Installing : glusterfs-libs-3.6.0.53-1.el6rhs.x86_64 4/212
Installing : glusterfs-3.6.0.53-1.el6rhs.x86_64 5/212

root@gluster2:~

File Edit View Search Terminal Help

sg3_utils-libs x86_64 1.28-6.el6 rhel-6-server-rpms 52 k

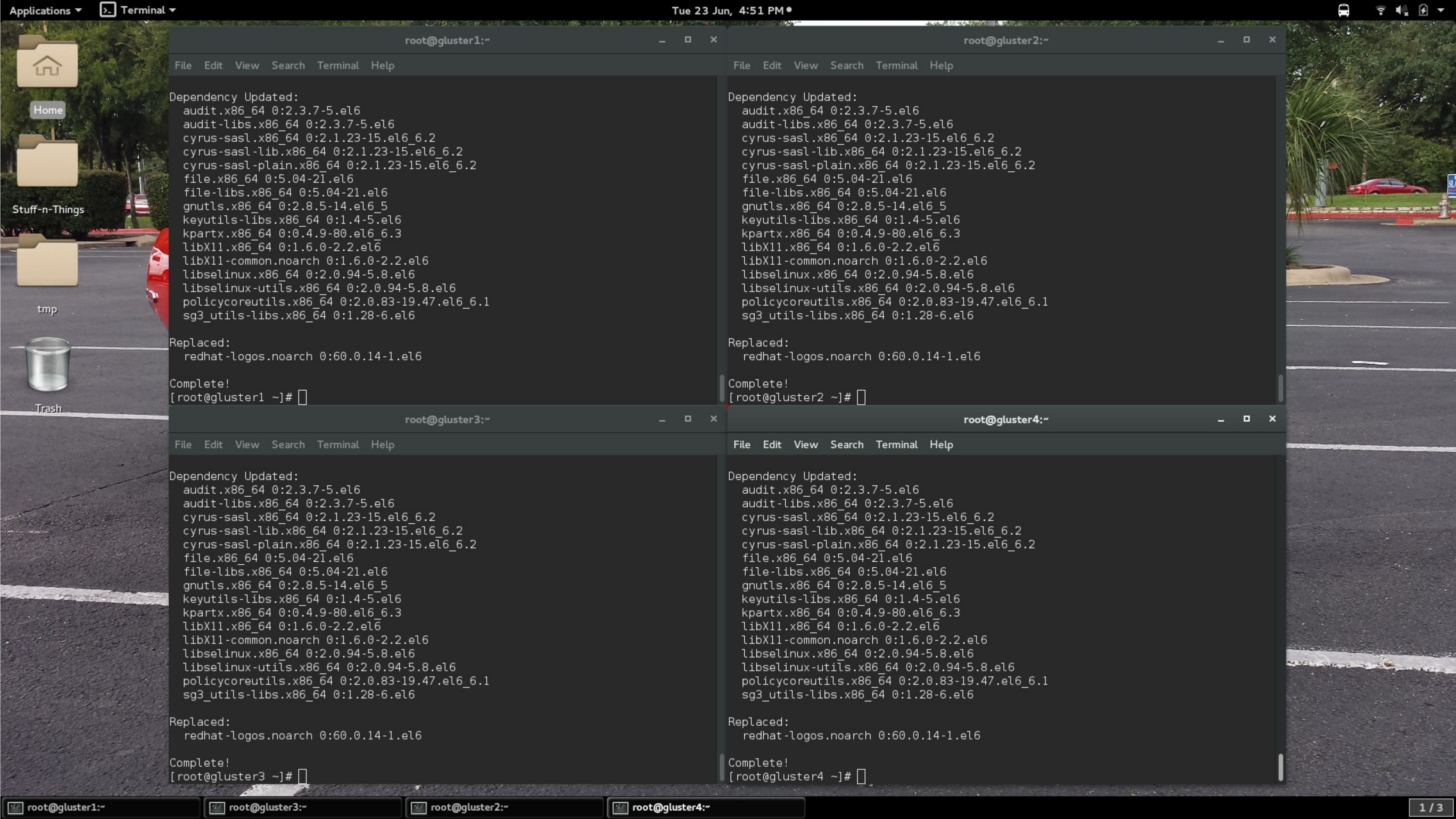
Transaction Summary
=====

root@gluster4:~

File Edit View Search Terminal Help

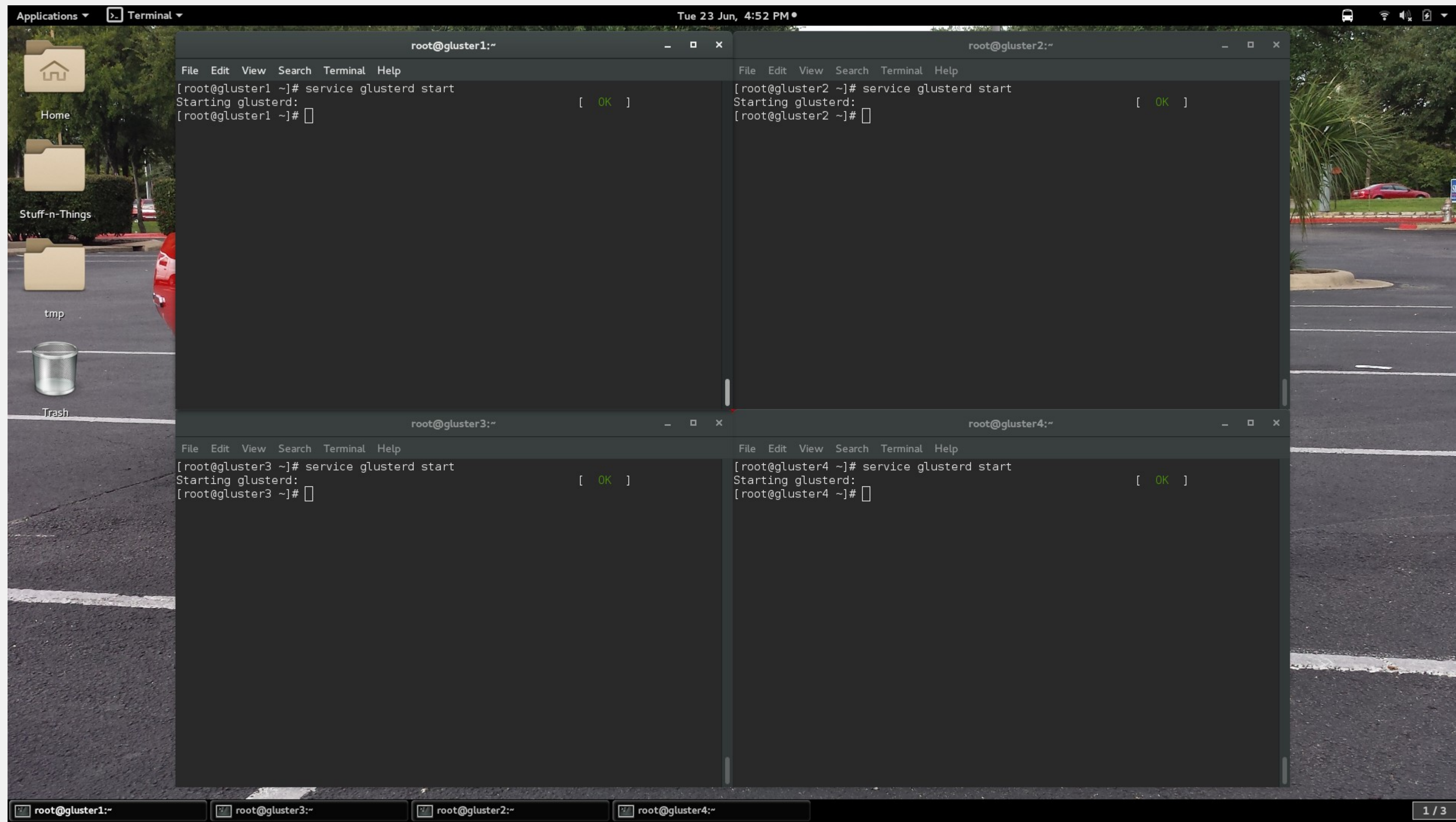
Downloading Packages:
warning: rpmts_HdrFromFdno: Header V3 RSA/SHA256 Signature, key ID fd431d51: NOK EY
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Importing GPG key 0xFD431D51:
Userid : Red Hat, Inc. (release key 2) <security@redhat.com>
Package: redhat-release-server-6Server-6.5.0.1.el6.x86_64 (@anaconda-RedHatEnte
rpriseLinux-201311111358.x86_64/6.5)
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Importing GPG key 0x2FA658E0:
Userid : Red Hat, Inc. (auxiliary key) <security@redhat.com>
Package: redhat-release-server-6Server-6.5.0.1.el6.x86_64 (@anaconda-RedHatEnte
rpriseLinux-201311111358.x86_64/6.5)
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
Running rpm_check_debug
Running Transaction Test
Transaction Test Succeeded
Running Transaction
Updating : cyrus-sasl-lib-2.1.23-15.el6_6.2.x86_64 1/212
Updating : libselinux-2.0.94-5.8.el6.x86_64 2/212
Updating : audit-libs-2.3.7-5.el6.x86_64 3/212
Installing : glusterfs-libs-3.6.0.53-1.el6rhs.x86_64 4/212
Installing : glusterfs-3.6.0.53-1.el6rhs.x86_64 5/212

root@gluster1:~ root@gluster3:~ root@gluster2:~ root@gluster4:~ 1 / 3



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# chkconfig glusterd --list  
glusterd      0:off    1:off    2:on     3:on     4:on     5:on     6:off  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# service glusterd start  
Starting glusterd: [ OK ]  
[root@gluster1 ~]#
```



CLIENT INSTALLATION

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# subscription-manager register --auto-attach  
Username: tcameron@redhat.com  
Password:  
The system has been registered with ID: 5c203798-4c40-4cc4-a48b-9f7451a8131e  
Installed Product Current Status:  
Product Name: Red Hat Enterprise Linux Server  
Status: Subscribed  
[root@host189 ~]#
```

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# subscription-manager repos --disable="*"  
[
```

```
root@host189:~  
File Edit View Search Terminal Help  
Repo cf-me-5.4-for-rhel-6-debug-rpms is disabled for this system.  
Repo rhel-server-rhsc1-6-beta-source-rpms is disabled for this system.  
Repo rhel-6-server-ose-2.1-jbossamq-debug-rpms is disabled for this system.  
Repo rhel-6-server-ose-2.2-infra-debug-rpms is disabled for this system.  
Repo rhel-6-server-ose-2.1-node-debug-rpms is disabled for this system.  
Repo rhel-6-server-extras-rpms is disabled for this system.  
Repo rhel-6-server-supplementary-source-rpms is disabled for this system.  
Repo rhel-6-server-rhev-beta-rpms is disabled for this system.  
Repo rhel-ha-for-rhel-6-server-aus-rpms is disabled for this system.  
Repo rhel-server-ose-infra-6-beta-rpms is disabled for this system.  
Repo rhel-6-server-rhev-3.1-debug-rpms is disabled for this system.  
Repo rhel-6-server-optional-source-rpms is disabled for this system.  
Repo rhel-rs-for-rhel-6-server-beta-debug-rpms is disabled for this system.  
Repo rhel-6-server-eus-rh-common-debug-rpms is disabled for this system.  
Repo jb-eap-6-for-rhel-6-server-source-rpms is disabled for this system.  
Repo rhel-6-server-rh-common-beta-debug-rpms is disabled for this system.  
Repo rhel-6-server-mrg-management-rpms is disabled for this system.  
Repo rhel-6-server-rhev-3.4-debug-rpms is disabled for this system.  
Repo rhel-ha-for-rhel-6-server-htb-source-rpms is disabled for this system.  
Repo rhel-6-server-rhceph-1.2-installer-rpms is disabled for this system.  
Repo rhel-server-ose-jbosseap-6-beta-debug-rpms is disabled for this system.  
Repo rhel-6-server-hts-beta-rpms is disabled for this system.  
Repo rhel-server-ost-6-folsom-source-rpms is disabled for this system.  
[root@host189 ~]#
```

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# subscription-manager repos --enable=rhel-6-server-rpms --enable=rhel-6-server-rhs-client-1-rpms  
Repo rhel-6-server-rpms is enabled for this system.  
Repo rhel-6-server-rhs-client-1-rpms is enabled for this system.  
[root@host189 ~]#
```

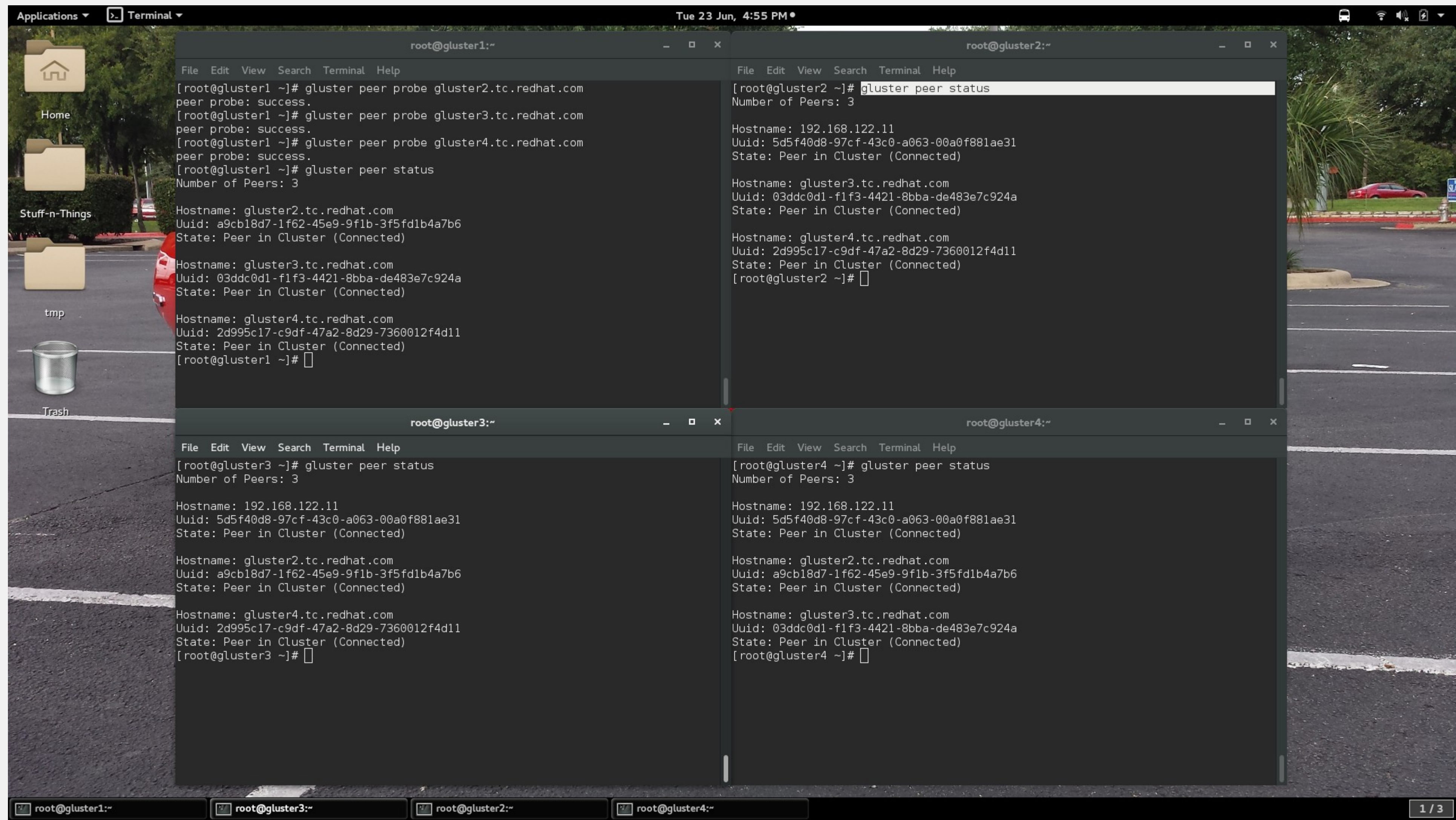
```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# yum install glusterfs glusterfs-fuse
```

```
root@host189:~  
File Edit View Search Terminal Help  
rpriseLinux-201311111358.x86_64/6.5)  
From : /etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release  
Running rpm_check_debug  
Running Transaction Test  
Transaction Test Succeeded  
Running Transaction  
  Installing : glusterfs-libs-3.6.0.53-1.el6.x86_64 1/4  
  Installing : glusterfs-3.6.0.53-1.el6.x86_64 2/4  
  Installing : glusterfs-api-3.6.0.53-1.el6.x86_64 3/4  
  Installing : glusterfs-fuse-3.6.0.53-1.el6.x86_64 4/4  
rhel-6-server-rpms/productid | 1.7 kB 00:00  
  Verifying : glusterfs-api-3.6.0.53-1.el6.x86_64 1/4  
  Verifying : glusterfs-libs-3.6.0.53-1.el6.x86_64 2/4  
  Verifying : glusterfs-fuse-3.6.0.53-1.el6.x86_64 3/4  
  Verifying : glusterfs-3.6.0.53-1.el6.x86_64 4/4  
  
Installed:  
  glusterfs.x86_64 0:3.6.0.53-1.el6 glusterfs-fuse.x86_64 0:3.6.0.53-1.el6  
  
Dependency Installed:  
  glusterfs-api.x86_64 0:3.6.0.53-1.el6 glusterfs-libs.x86_64 0:3.6.0.53-1.el6  
  
Complete!  
[root@host189 ~]#
```

ADDING SERVERS TO THE TRUSTED POOL

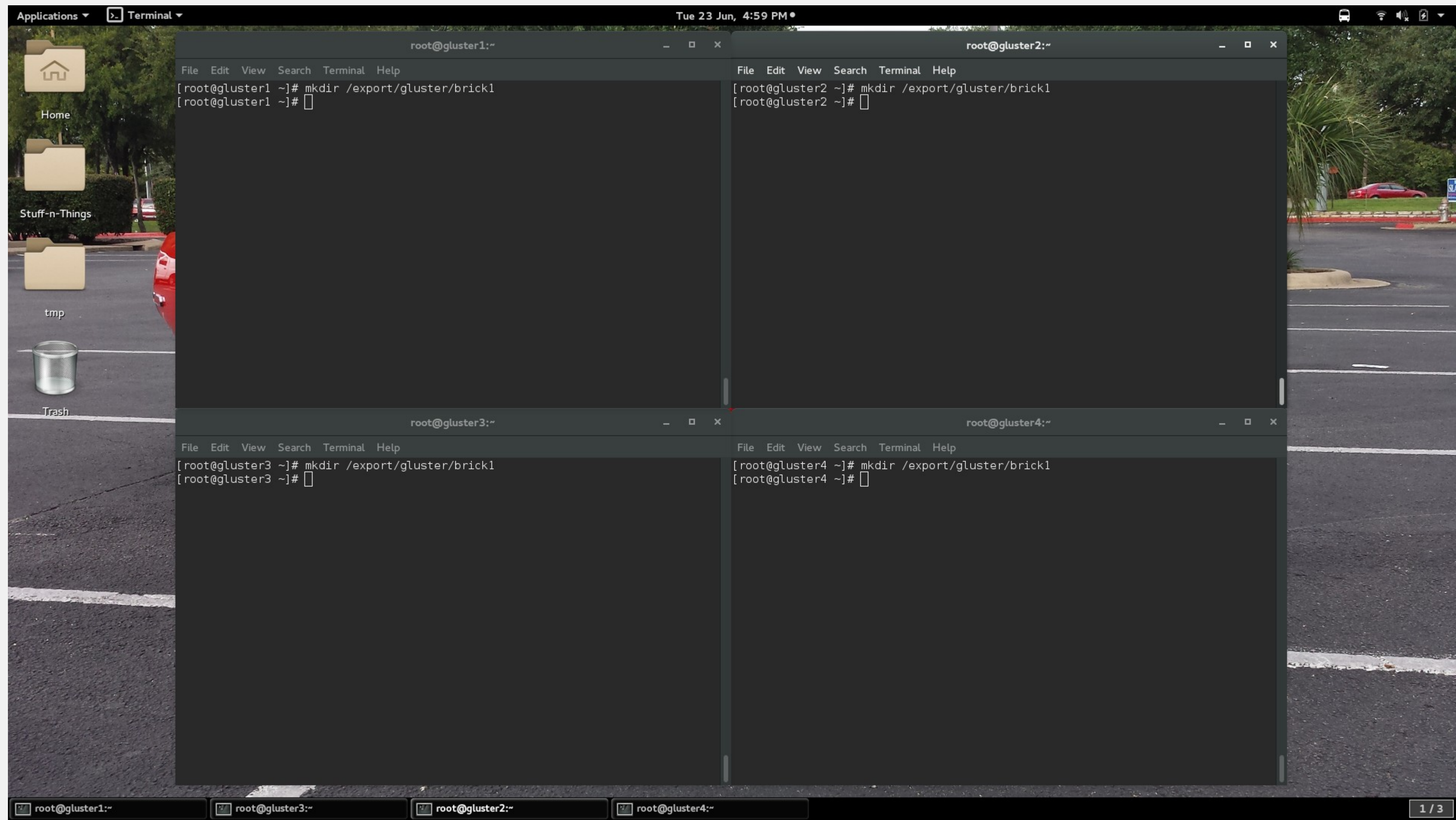
```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster peer probe gluster2.tc.redhat.com  
peer probe: success.  
[root@gluster1 ~]# gluster peer probe gluster3.tc.redhat.com  
peer probe: success.  
[root@gluster1 ~]# gluster peer probe gluster4.tc.redhat.com  
peer probe: success.  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster peer probe gluster2.tc.redhat.com  
peer probe: success.  
[root@gluster1 ~]# gluster peer probe gluster3.tc.redhat.com  
peer probe: success.  
[root@gluster1 ~]# gluster peer probe gluster4.tc.redhat.com  
peer probe: success.  
[root@gluster1 ~]# gluster peer status  
Number of Peers: 3  
  
Hostname: gluster2.tc.redhat.com  
Uuid: a9cb18d7-1f62-45e9-9f1b-3f5fd1b4a7b6  
State: Peer in Cluster (Connected)  
  
Hostname: gluster3.tc.redhat.com  
Uuid: 03ddc0d1-f1f3-4421-8bba-de483e7c924a  
State: Peer in Cluster (Connected)  
  
Hostname: gluster4.tc.redhat.com  
Uuid: 2d995c17-c9df-47a2-8d29-7360012f4d11  
State: Peer in Cluster (Connected)  
[root@gluster1 ~]#
```



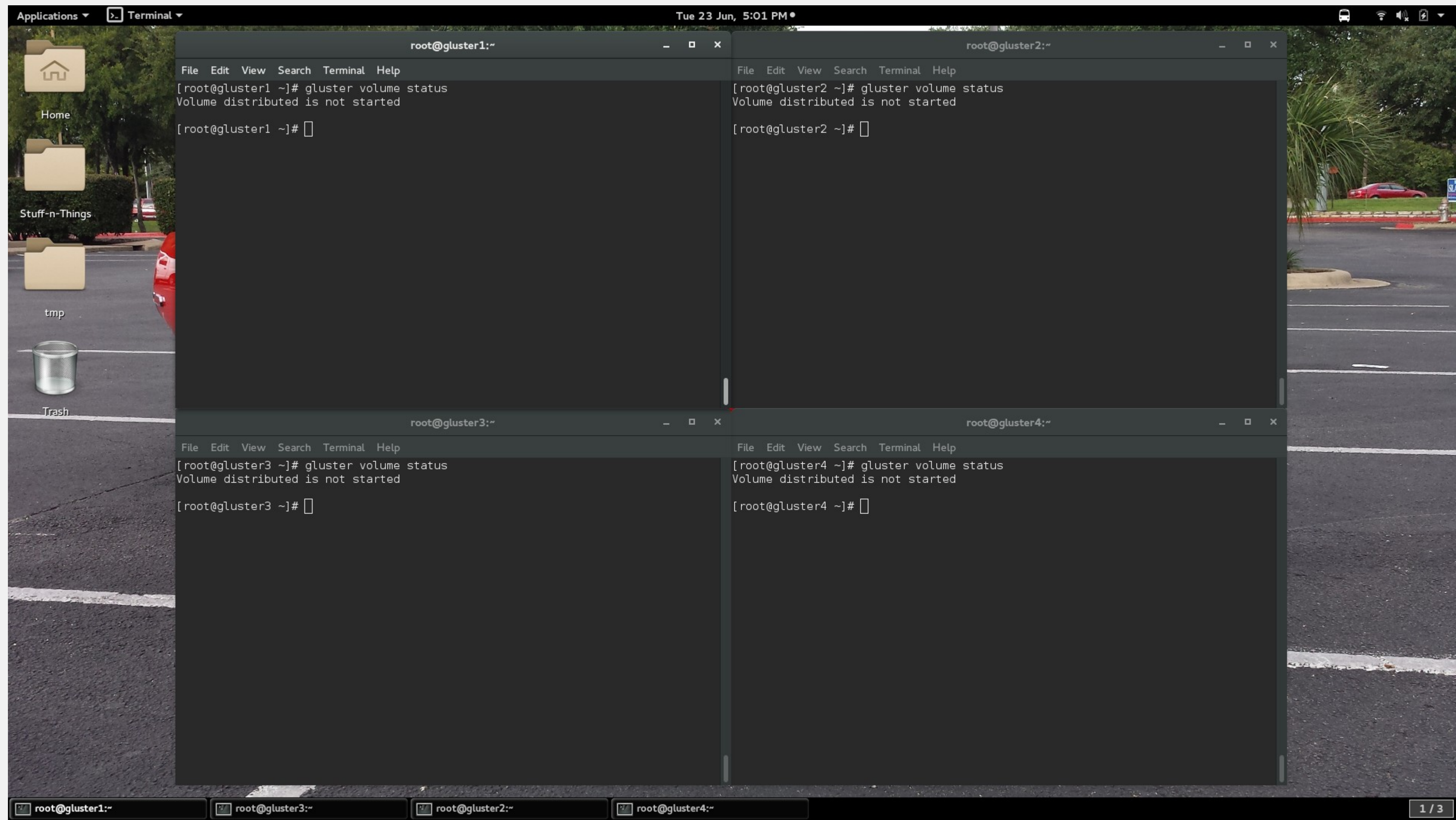
DISTRIBUTED VOLUMES

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# mkdir /export/gluster/brick1  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume create distributed gluster1.tc.redhat.com:/exp  
ort/gluster/brick1/ gluster2.tc.redhat.com:/export/gluster/brick1/ gluster3.tc.r  
edhat.com:/export/gluster/brick1/ gluster4.tc.redhat.com:/export/gluster/brick1/  
volume create: distributed: success: please start the volume to access data  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume status  
Volume distributed is not started  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume start distributed  
volume start: distributed: success  
[root@gluster1 ~]#
```

```
root@gluster1:~
File Edit View Search Terminal Help
[root@gluster1 ~]# gluster volume start distributed
volume start: distributed: success
[root@gluster1 ~]# gluster volume status
Status of volume: distributed
Gluster process                TCP Port  RDMA Port  Online  Pid
-----
Brick gluster1.tc.redhat.com:/export/gluster/brick1 49152    0          Y      2584
Brick gluster2.tc.redhat.com:/export/gluster/brick1 49152    0          Y      2442
Brick gluster3.tc.redhat.com:/export/gluster/brick1 49152    0          Y      2439
Brick gluster4.tc.redhat.com:/export/gluster/brick1 49152    0          Y      2435
NFS Server on localhost          N/A      N/A        N       N/A
NFS Server on gluster3.tc.redhat.com N/A      N/A        N       N/A
NFS Server on gluster4.tc.redhat.com N/A      N/A        N       N/A
NFS Server on gluster2.tc.redhat.com N/A      N/A        N       N/A

Task Status of Volume distributed
-----
There are no active volume tasks

[root@gluster1 ~]#
```

Applications

Terminal

Home

Stuff-n-Things

tmp

Trash

root@gluster1:~

File Edit View Search Terminal Help

[root@gluster1 ~]# gluster volume status

Status of volume: distributed

Gluster process

	TCP Port	RDMA Port	Online	Pid
Brick gluster1.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2584
Brick gluster2.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2442
Brick gluster3.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2439
Brick gluster4.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2435
NFS Server on localhost	N/A	N/A	N	N/A
NFS Server on gluster4.tc.redhat.com	N/A	N/A	N	N/A
NFS Server on gluster3.tc.redhat.com	N/A	N/A	N	N/A
NFS Server on gluster2.tc.redhat.com	N/A	N/A	N	N/A

Task Status of Volume distributed

There are no active volume tasks

[root@gluster1 ~]#

root@gluster2:~

File Edit View Search Terminal Help

[root@gluster2 ~]# gluster volume status

Status of volume: distributed

Gluster process

	TCP Port	RDMA Port	Online	Pid
Brick gluster1.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2584
Brick gluster2.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2442
Brick gluster3.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2439
Brick gluster4.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2435
NFS Server on localhost	N/A	N/A	N	N/A
NFS Server on 192.168.122.11	N/A	N/A	N	N/A
NFS Server on gluster3.tc.redhat.com	N/A	N/A	N	N/A
NFS Server on gluster4.tc.redhat.com	N/A	N/A	N	N/A

Task Status of Volume distributed

There are no active volume tasks

[root@gluster2 ~]#

root@gluster3:~

File Edit View Search Terminal Help

[root@gluster3 ~]# gluster volume status

Status of volume: distributed

Gluster process

	TCP Port	RDMA Port	Online	Pid
Brick gluster1.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2584
Brick gluster2.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2442
Brick gluster3.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2439
Brick gluster4.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2435
NFS Server on localhost	N/A	N/A	N	N/A
NFS Server on 192.168.122.11	N/A	N/A	N	N/A
NFS Server on gluster4.tc.redhat.com	N/A	N/A	N	N/A
NFS Server on gluster2.tc.redhat.com	N/A	N/A	N	N/A

Task Status of Volume distributed

There are no active volume tasks

[root@gluster3 ~]#

root@gluster4:~

File Edit View Search Terminal Help

[root@gluster4 ~]# gluster volume status

Status of volume: distributed

Gluster process

	TCP Port	RDMA Port	Online	Pid
Brick gluster1.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2584
Brick gluster2.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2442
Brick gluster3.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2439
Brick gluster4.tc.redhat.com:/export/gluster/brick1	49152	0	Y	2435
NFS Server on localhost	N/A	N/A	N	N/A
NFS Server on 192.168.122.11	N/A	N/A	N	N/A
NFS Server on gluster3.tc.redhat.com	N/A	N/A	N	N/A
NFS Server on gluster2.tc.redhat.com	N/A	N/A	N	N/A

Task Status of Volume distributed

There are no active volume tasks

[root@gluster4 ~]#

root@gluster1:~

root@gluster3:~

root@gluster2:~

root@gluster4:~

1 / 3

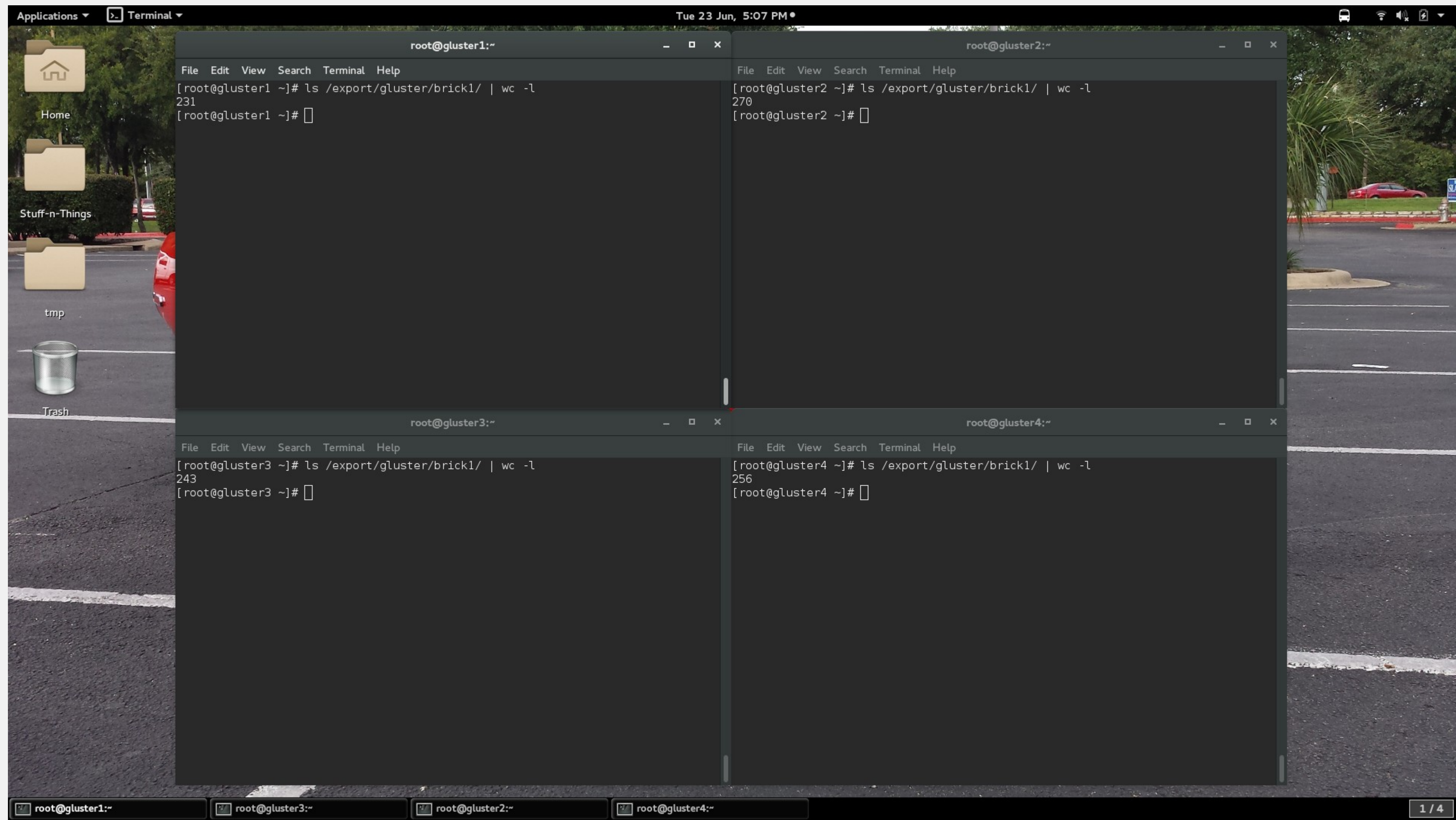
```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume info  
  
Volume Name: distributed  
Type: Distribute  
Volume ID: 315c0f4f-fa57-4dc7-a21e-bb45958b663b  
Status: Started  
Snap Volume: no  
Number of Bricks: 4  
Transport-type: tcp  
Bricks:  
Brick1: gluster1.tc.redhat.com:/export/gluster/brick1  
Brick2: gluster2.tc.redhat.com:/export/gluster/brick1  
Brick3: gluster3.tc.redhat.com:/export/gluster/brick1  
Brick4: gluster4.tc.redhat.com:/export/gluster/brick1  
Options Reconfigured:  
performance.readdir-ahead: on  
snap-max-hard-limit: 256  
snap-max-soft-limit: 90  
auto-delete: disable  
[root@gluster1 ~]#
```

ACCESSING DISTRIBUTED VOLUMES

```
root@t540p:~  
File Edit View Search Terminal Help  
[tcameron@t540p Desktop]$ su -  
fr3Password:  
[root@t540p ~]# mount -t glusterfs gluster1.tc.redhat.com:/distributed /mnt/gluster/  
[root@t540p ~]# df -h /mnt/gluster/  
Filesystem                                Size  Used Avail Use% Mounted on  
gluster1.tc.redhat.com:/distributed      24G   129M   24G    1% /mnt/gluster  
[root@t540p ~]#
```

```
root@t540p:/mnt/gluster
File Edit View Search Terminal Help
[root@t540p ~]# cd /mnt/gluster/
[root@t540p gluster]# ls
[root@t540p gluster]# for i in $(seq 1 1000); do echo $i > $i; done
[root@t540p gluster]# ls | wc -l
1000
[root@t540p gluster]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# ls /export/gluster/brick1/ | wc -l  
231  
[root@gluster1 ~]#
```



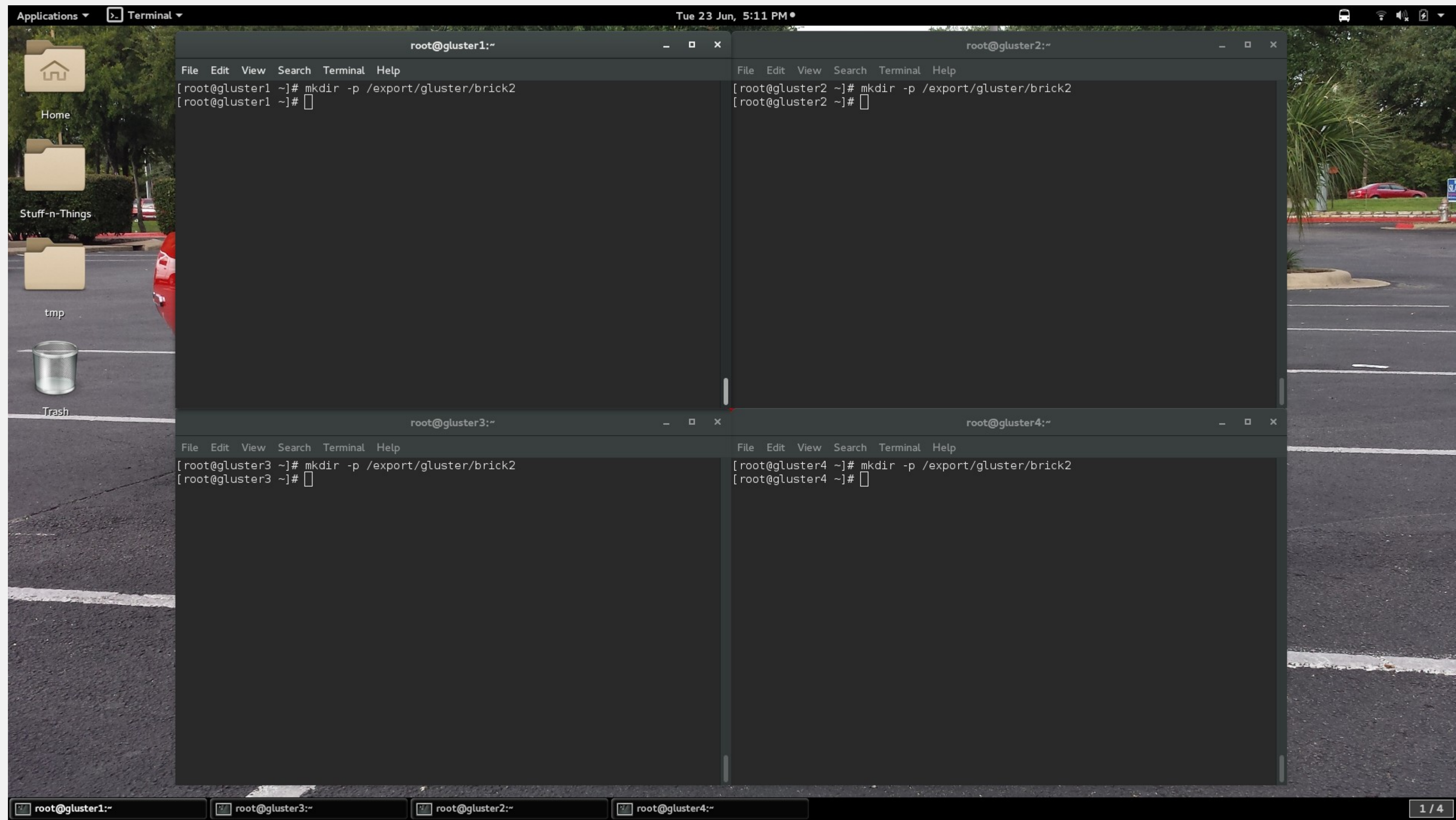
```
root@t540p:/mnt
File Edit View Search Terminal Help
[root@t540p gluster]# cd ..
[root@t540p mnt]# umount gluster
[root@t540p mnt]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume stop distributed  
Stopping volume will make its data inaccessible. Do you want to continue? (y/n)  
y  
volume stop: distributed: success  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume delete distributed  
Deleting volume will erase all information about the volume. Do you want to continue? (y/n) y  
volume delete: distributed: success  
[root@gluster1 ~]#
```

REPLICATED VOLUMES

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# mkdir -p /export/gluster/brick2  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume create replicated replica 2 gluster1.tc.redhat  
.com:/export/gluster/brick2/ gluster2.tc.redhat.com:/export/gluster/brick2/  
volume create: replicated: success: please start the volume to access data  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume start replicated  
volume start: replicated: success  
[root@gluster1 ~]#
```

```
root@gluster1:~
File Edit View Search Terminal Help
[root@gluster1 ~]# gluster volume status
Volume distributed is not started

Status of volume: replicated
Gluster process                                TCP Port  RDMA Port  Online  Pid
-----
Brick gluster1.tc.redhat.com:/export/gluster/brick2 49153      0           Y       2824
Brick gluster2.tc.redhat.com:/export/gluster/brick2 49153      0           Y       2615
NFS Server on localhost                          N/A        N/A         N       N/A
Self-heal Daemon on localhost                     N/A        N/A         Y       2846
NFS Server on gluster4.tc.redhat.com                N/A        N/A         N       N/A
Self-heal Daemon on gluster4.tc.redhat.com          N/A        N/A         Y       2584
NFS Server on gluster3.tc.redhat.com                N/A        N/A         N       N/A
Self-heal Daemon on gluster3.tc.redhat.com          N/A        N/A         Y       2588
NFS Server on gluster2.tc.redhat.com                N/A        N/A         N       N/A
Self-heal Daemon on gluster2.tc.redhat.com          N/A        N/A         Y       2638

Task Status of Volume replicated
-----
There are no active volume tasks

[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume info replicated  
  
Volume Name: replicated  
Type: Replicate  
Volume ID: f9418ba4-2d43-4f87-8d89-dbab82df0f2c  
Status: Started  
Snap Volume: no  
Number of Bricks: 1 x 2 = 2  
Transport-type: tcp  
Bricks:  
Brick1: gluster1.tc.redhat.com:/export/gluster/brick2  
Brick2: gluster2.tc.redhat.com:/export/gluster/brick2  
Options Reconfigured:  
performance.readdir-ahead: on  
auto-delete: disable  
snap-max-soft-limit: 90  
snap-max-hard-limit: 256  
[root@gluster1 ~]#
```

ACCESSING REPLICATED VOLUMES

```
root@t540p:~  
File Edit View Search Terminal Help  
[root@t540p ~]# mount -t glusterfs gluster1.tc.redhat.com:replicated /mnt/gluster/  
r/  
[root@t540p ~]# df -h /mnt/gluster/  
Filesystem                                Size  Used Avail Use% Mounted on  
gluster1.tc.redhat.com:replicated 5.9G   34M  5.9G   1% /mnt/gluster  
[root@t540p ~]#
```

```
root@t540p:/mnt/gluster
File Edit View Search Terminal Help
[root@t540p ~]# cd /mnt/gluster/
[root@t540p gluster]# for i in $(seq 1 1000); do echo $i > $i; done
[root@t540p gluster]# ls | wc -l
1000
[root@t540p gluster]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# ls /export/gluster/brick2/ | wc -l  
1000  
[root@gluster1 ~]#
```

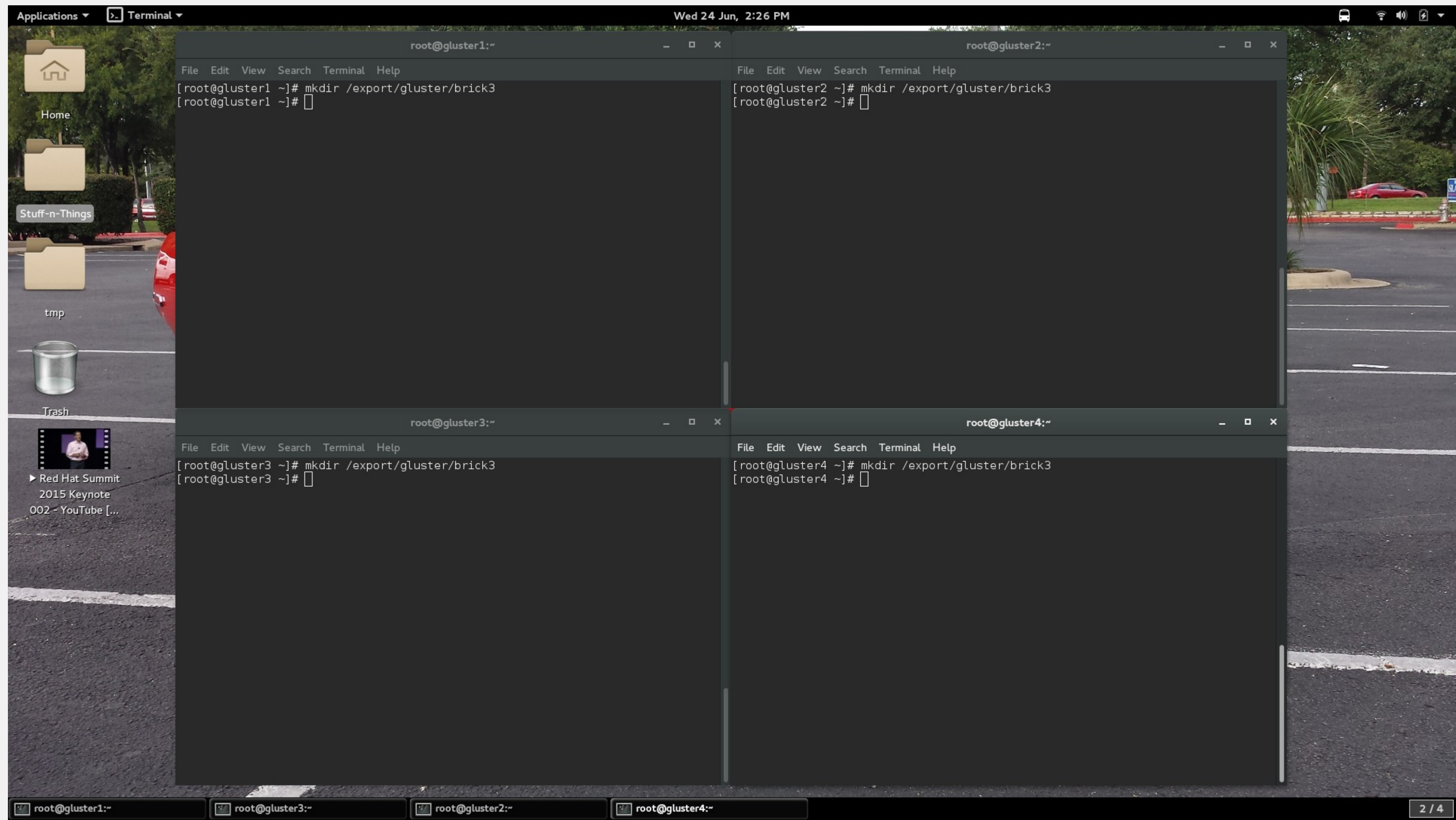
```
root@t540p:/mnt
File Edit View Search Terminal Help
[root@t540p gluster]# cd ..
[root@t540p mnt]# umount gluster/
[root@t540p mnt]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume stop replicated  
Stopping volume will make its data inaccessible. Do you want to continue? (y/n)  
y  
volume stop: replicated: success  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume delete replicated  
Deleting volume will erase all information about the volume. Do you want to continue? (y/n) y  
volume delete: replicated: success  
[root@gluster1 ~]#
```

DISTRIBUTED + REPLICATED VOLUMES

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# mkdir /export/gluster/brick3  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume create dist-rep replica 2 gluster1.tc.redhat.c  
om:/export/gluster/brick3/ gluster2.tc.redhat.com:/export/gluster/brick3/ gluste  
r3.tc.redhat.com:/export/gluster/brick3/ gluster4.tc.redhat.com:/export/gluster/  
brick3/  
volume create: dist-rep: success: please start the volume to access data  
[root@gluster1 ~]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume start dist-rep  
volume start: dist-rep: success  
[root@gluster1 ~]#
```

```
root@gluster1:~
File Edit View Search Terminal Help
[root@gluster1 ~]# gluster volume status dist-rep
Status of volume: dist-rep
Gluster process                                TCP Port  RDMA Port  Online  Pid
-----
Brick gluster1.tc.redhat.com:/export/gluster/brick3 49154      0           Y       3628
Brick gluster2.tc.redhat.com:/export/gluster/brick3 49154      0           Y       3504
Brick gluster3.tc.redhat.com:/export/gluster/brick3 49153      0           Y       3488
Brick gluster4.tc.redhat.com:/export/gluster/brick3 49153      0           Y       3488
NFS Server on localhost                          2049      0           Y       3642
Self-heal Daemon on localhost                    N/A       N/A         Y       3651
NFS Server on gluster2.tc.redhat.com              2049      0           Y       3519
Self-heal Daemon on gluster2.tc.redhat.com        N/A       N/A         Y       3526
NFS Server on gluster4.tc.redhat.com              2049      0           Y       3502
Self-heal Daemon on gluster4.tc.redhat.com        N/A       N/A         Y       3510
NFS Server on gluster3.tc.redhat.com              2049      0           Y       3503
Self-heal Daemon on gluster3.tc.redhat.com        N/A       N/A         Y       3510

Task Status of Volume dist-rep
-----
There are no active volume tasks

[root@gluster1 ~]#
```

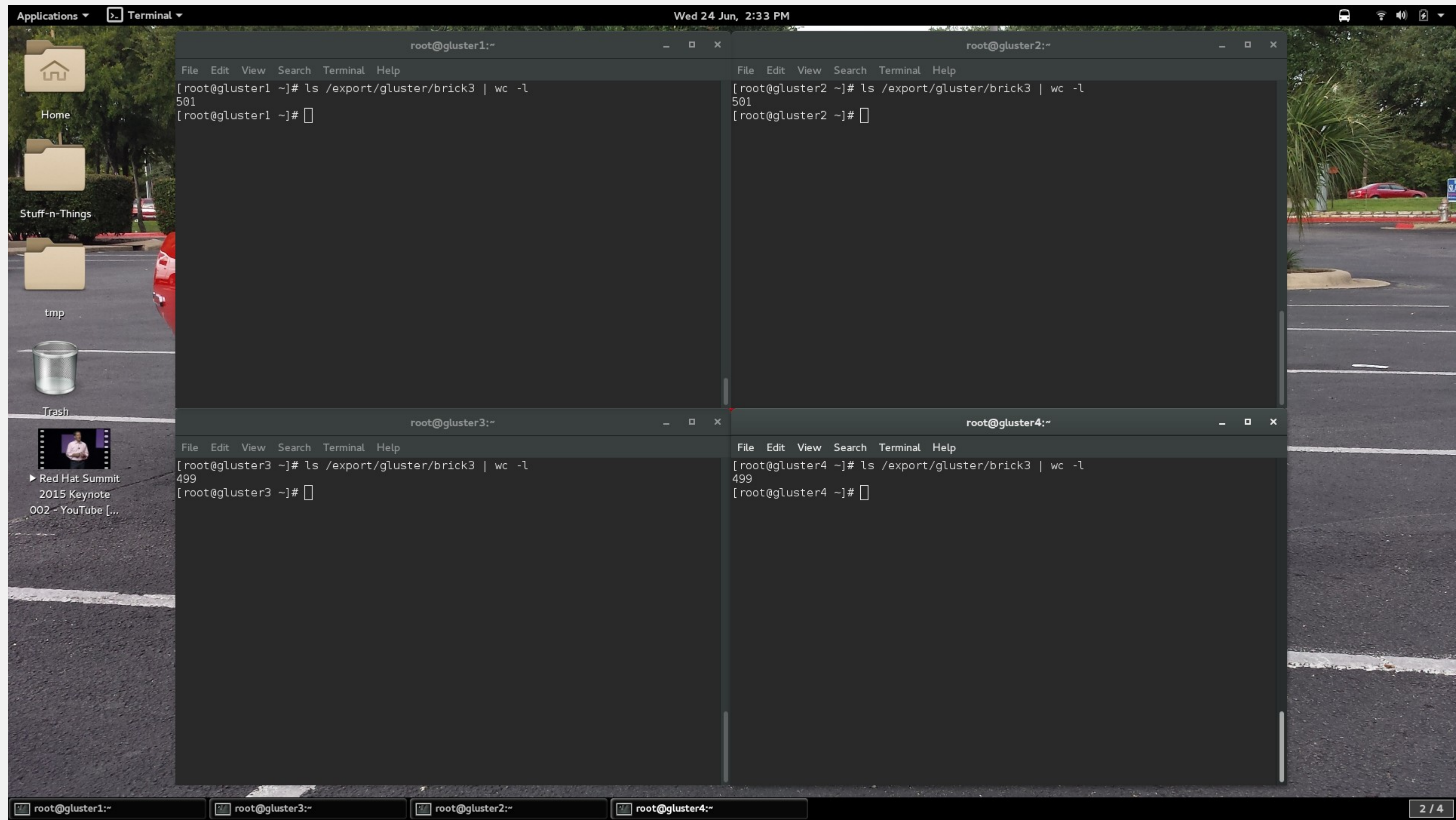
```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume info dist-rep  
  
Volume Name: dist-rep  
Type: Distributed-Replicate  
Volume ID: 816828a4-2b89-4d10-b4de-ad1166649e0c  
Status: Started  
Snap Volume: no  
Number of Bricks: 2 x 2 = 4  
Transport-type: tcp  
Bricks:  
Brick1: gluster1.tc.redhat.com:/export/gluster/brick3  
Brick2: gluster2.tc.redhat.com:/export/gluster/brick3  
Brick3: gluster3.tc.redhat.com:/export/gluster/brick3  
Brick4: gluster4.tc.redhat.com:/export/gluster/brick3  
Options Reconfigured:  
performance.readdir-ahead: on  
auto-delete: disable  
snap-max-soft-limit: 90  
snap-max-hard-limit: 256  
[root@gluster1 ~]#
```

ACCESSING DISTRIBUTED + REPLICATED VOLUMES

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# mount -t glusterfs gluster1:dist-rep /mnt/gluster/  
[root@host189 ~]# df -h /mnt/gluster/  
Filesystem      Size  Used Avail Use% Mounted on  
gluster1:dist-rep 12G   65M   12G   1% /mnt/gluster  
[root@host189 ~]#
```

```
root@host189:/mnt/gluster
File Edit View Search Terminal Help
[root@host189 gluster]# for i in $(seq 1 1000); do echo $i > $i; done
[root@host189 gluster]# ls | wc -l
1000
[root@host189 gluster]#
```

```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# ls /export/gluster/brick3 | wc -l  
501  
[root@gluster1 ~]#
```



```
root@gluster1:~  
File Edit View Search Terminal Help  
[root@gluster1 ~]# gluster volume stop dist-rep  
Stopping volume will make its data inaccessible. Do you want to continue? (y/n)  
y  
volume stop: dist-rep: success  
[root@gluster1 ~]# gluster volume delete dist-rep  
Deleting volume will erase all information about the volume. Do you want to continue? (y/n) y  
volume delete: dist-rep: success  
[root@gluster1 ~]#
```

CONNECTING VIA NFS

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# yum install nfs-utils
```

```
root@host189:~  
File Edit View Search Terminal Help  
Cleanup      : keyutils-libs-1.4-4.el6.x86_64 9/9  
Verifying    : keyutils-libs-1.4-5.el6.x86_64 1/9  
Verifying    : libevent-1.4.13-4.el6.x86_64 2/9  
Verifying    : rpcbind-0.2.0-11.el6.x86_64 3/9  
Verifying    : keyutils-1.4-5.el6.x86_64 4/9  
Verifying    : 1:nfs-utils-1.2.3-54.el6.x86_64 5/9  
Verifying    : nfs-utils-lib-1.1.5-9.el6_6.x86_64 6/9  
Verifying    : libtirpc-0.2.1-10.el6.x86_64 7/9  
Verifying    : libgssglue-0.1-11.el6.x86_64 8/9  
Verifying    : keyutils-libs-1.4-4.el6.x86_64 9/9  
  
Installed:  
  nfs-utils.x86_64 1:1.2.3-54.el6  
  
Dependency Installed:  
  keyutils.x86_64 0:1.4-5.el6          libevent.x86_64 0:1.4.13-4.el6  
  libgssglue.x86_64 0:0.1-11.el6      libtirpc.x86_64 0:0.2.1-10.el6  
  nfs-utils-lib.x86_64 0:1.1.5-9.el6_6  rpcbind.x86_64 0:0.2.0-11.el6  
  
Dependency Updated:  
  keyutils-libs.x86_64 0:1.4-5.el6  
  
Complete!  
[root@host189 ~]#
```

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# showmount -e gluster1.tc.redhat.com  
Export list for gluster1.tc.redhat.com:  
/dist-rep *  
[root@host189 ~]#
```

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# chkconfig rpcbind on  
[root@host189 ~]# service rpcbind start  
Starting rpcbind: [ OK ]  
[root@host189 ~]# chkconfig nfslock on  
[root@host189 ~]# service nfslock start  
Starting NFS statd: [ OK ]  
[root@host189 ~]#
```

```
root@host189:~  
File Edit View Search Terminal Help  
[root@host189 ~]# mkdir /mnt/nfs && mount -t nfs gluster1.tc.redhat.com:/dist-rep /mnt/nfs  
[root@host189 ~]# df -h /mnt/nfs  
Filesystem                                Size  Used Avail Use% Mounted on  
gluster1.tc.redhat.com:/dist-rep          12G   65M   12G    1% /mnt/nfs  
[root@host189 ~]#
```

QUESTIONS?

THANKS! DO THE SURVEY!

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