

## GlusterFS Project Summary - Hanicho's Docker & VM Adventure

### Goal:

To build a 4-node GlusterFS cluster using Docker containers, explore peer communication, volume replication, and also

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### What We Did:

1. Created a custom Dockerfile to prepare an Ubuntu image with GlusterFS installed.
2. Built a Docker image called 'glusterfs-custom'.
3. Created a custom Docker network ('gluster-net') for container communication.
4. Wrote a bash script to automate launching 4 containers (gfs-node1 to gfs-node4).
5. Used 'gluster peer probe' to connect all 4 nodes into a single cluster.
6. Created and started a replicated volume (gv0).
7. Mounted the volume and wrote a test file to check replication.
8. Accessed the mounted volume across nodes to confirm data replication.
9. Explored using actual VMs (ubuntu-vm, ubuntu-vm2, etc.) via Multipass.
10. Ran into peer probe issues on VMs and debugged with IP-based connections.

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### Problems & How We Solved Them:

1. Docker Permission Error
  - Problem: Couldn't run Docker without sudo.
  - Fix: Added user to Docker group using 'sudo usermod -aG docker \$USER' and 'newgrp docker'.
2. Accidental Terminal Paste Errors
  - Problem: Copying/pasting log output as commands caused 'command not found' errors.
  - Fix: Cleaned up workflow and only entered valid commands.
3. Missing Containers (e.g. gfs-node2)
  - Problem: Some containers didn't appear due to naming conflicts or errors.
  - Fix: Removed and re-created containers properly using 'docker rm -f' and re-ran the script.
4. Peer Probe Failed in VM Setup
  - Problem: Error message 'Transport endpoint is not connected'.
  - Fix: Started 'glusterd' service and used IPs instead of hostnames for probing.
5. PDF Export Unicode Errors
  - Problem: Emojis and curly quotes broke the PDF exporter.
  - Fix: Cleaned text to ASCII and re-generated a clean, professional PDF.

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### Screenshot Descriptions:

#### Screenshot 1:

We see all the running VMs in Multipass, confirming that 'docker-vm' and the four ubuntu-vms are online and ready for

#### Screenshot 2:

Inside the Docker VM, we launched all 4 GlusterFS containers using a bash script and connected them with peer probe

#### Screenshot 3:

Shows the successful peer status, volume creation ('gv0'), and the mounted volume with a file written and read to conf

<input type="checkbox"/>	ubuntu-vm2	<div><div></div><div>● running</div></div>	<div><div></div><div>246.3MiB / 1.9GiB</div></div>	<div><div></div><div>2.3GiB / 19.3GiB</div></div>	Ubuntu 24.04.2 ...	192.168.64.3	-
<input type="checkbox"/>	ubuntu-vm3	<div><div></div><div>● running</div></div>	<div><div></div><div>234.6MiB / 1.9GiB</div></div>	<div><div></div><div>2.3GiB / 19.3GiB</div></div>	Ubuntu 24.04.2 ...	192.168.64.4	-
<input type="checkbox"/>	ubuntu-vm4	<div><div></div><div>● running</div></div>	<div><div></div><div>233.4MiB / 952.9MiB</div></div>	<div><div></div><div>2.3GiB / 4.8GiB</div></div>	Ubuntu 24.04.2 ...	192.168.64.5	-
Total			<div><div></div><div>1.4GiB / 8.6GiB</div></div>	<div><div></div><div>12.7GiB / 72.3GiB</div></div>			

```
volume create: gv0: success: please start the volume to access data
root@gfs-node1:/# gluster volume start gv0
volume start: gv0: success
root@gfs-node1:/# mkdir /mnt/glusterfs
root@gfs-node1:/# echo "Hanicho was here 🏠" > /mnt/glusterfs/hanicho.txt
root@gfs-node1:/# cat /mnt/glusterfs/hanicho.txt
Hanicho was here 🏠
root@gfs-node1:/# █
```

obe.

```
🚀 Starting gfs-node2...  
77b34a89b5f5a767c92d0df0586fededee9ea717ed0bbdbcb201be887ac7d4ea  
🚀 Starting gfs-node3...  
a41d41d43aa31f8e1420b7ce7caaf0b2ea2364dd1862caf5051f6a88782f6dc  
🚀 Starting gfs-node4...  
46b927356573cae96eb0306df17f6cc9c131056d519d598faf7250be8f403cb7  
🎉 All 4 GlusterFS nodes launched!  
ubuntu@docker-vm:~/glusterfs-custom$
```

-node1.

```
Last login: Wed Apr  2 22:14:49 2025 from 192.168.64.1
ubuntu@ubuntu-vm:~$ sudo gluster peer probe ubuntu-vm4
peer probe: failed: Probe returned with Transport endpoint is not connected
ubuntu@ubuntu-vm:~$ sudo gluster peer probe ubuntu-vm4
peer probe: failed: Probe returned with Transport endpoint is not connected
ubuntu@ubuntu-vm:~$ exit
logout
hananahmed@Hanans-MacBook-Air ~ % multipass list
```

pppeared.

```
Creating brick dir on ubuntu-vm...  
multipass: command not found  
Creating brick dir on ubuntu-vm2...  
multipass: command not found  
Creating brick dir on ubuntu-vm3...  
multipass: command not found  
Creating brick dir on ubuntu-vm4...  
multipass: command not found  
ubuntu@ubuntu-vm:~$
```

VMs.