

RED HAT
SUMMIT

10 YEARS *and counting*
SAN FRANCISCO | APRIL 14-17, 2014

The New World of NFS

Steve Dickson

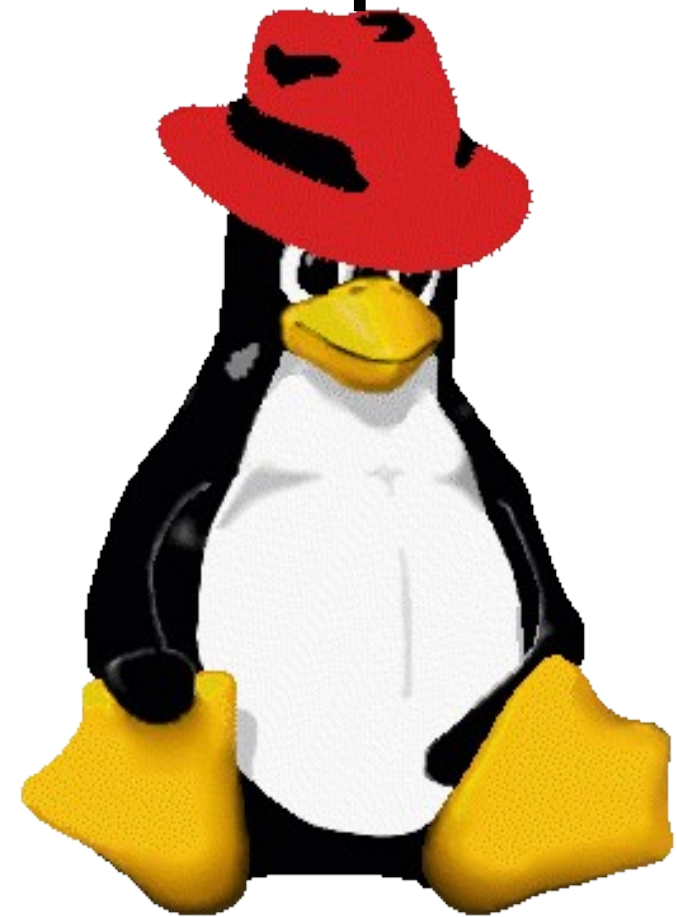
Consulting Software Engineer, Red Hat

Tuesday, April 15

The Path to RHEL 7

RHEL AS 2.1

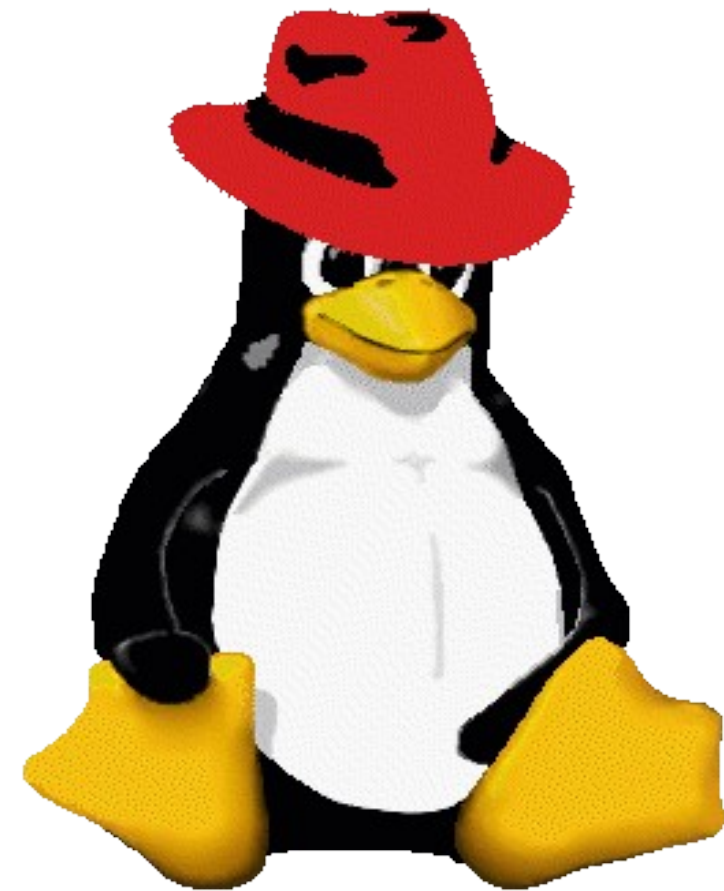
- UDP Default
- V2/V3 protocols



Mar 2002

RHEL 3

- TCP Default
- V2/v3



Oct 2003

RHEL 4

- V2/V3/V4 (client)



Feb 2005

RHEL 5

- V2/V3/V4



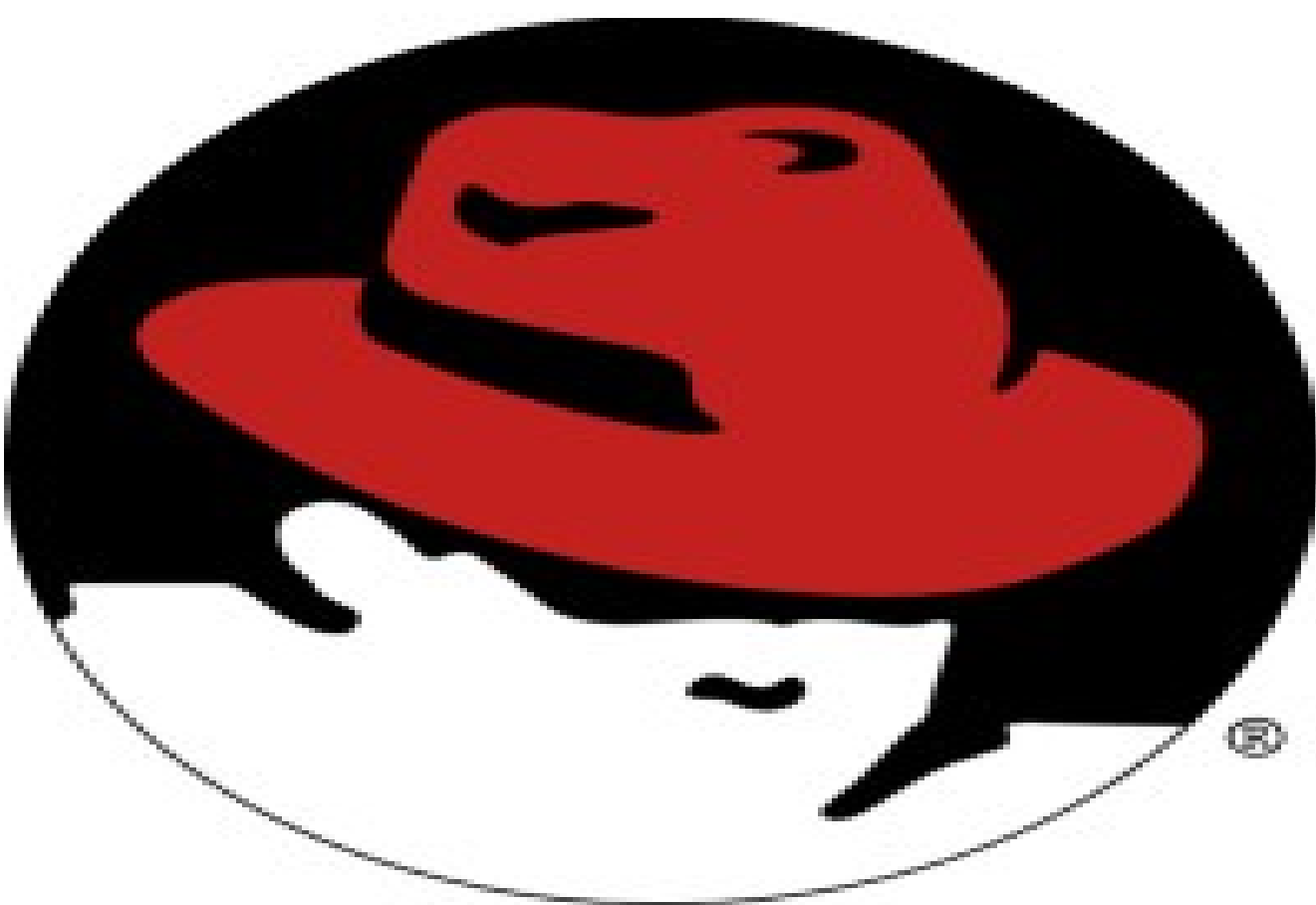
Mar 2007

RHEL 6

- V2/V3/V4/V4.1



Nov 2010



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Why RHEL 7?

pNFS Client Support

NFS 4.2 Labeled NFS

NFS 4.1 Server Support

Federated File
System

~~NFS v2~~

GSS-proxy



Red Hat
Enterprise Linux 7.0

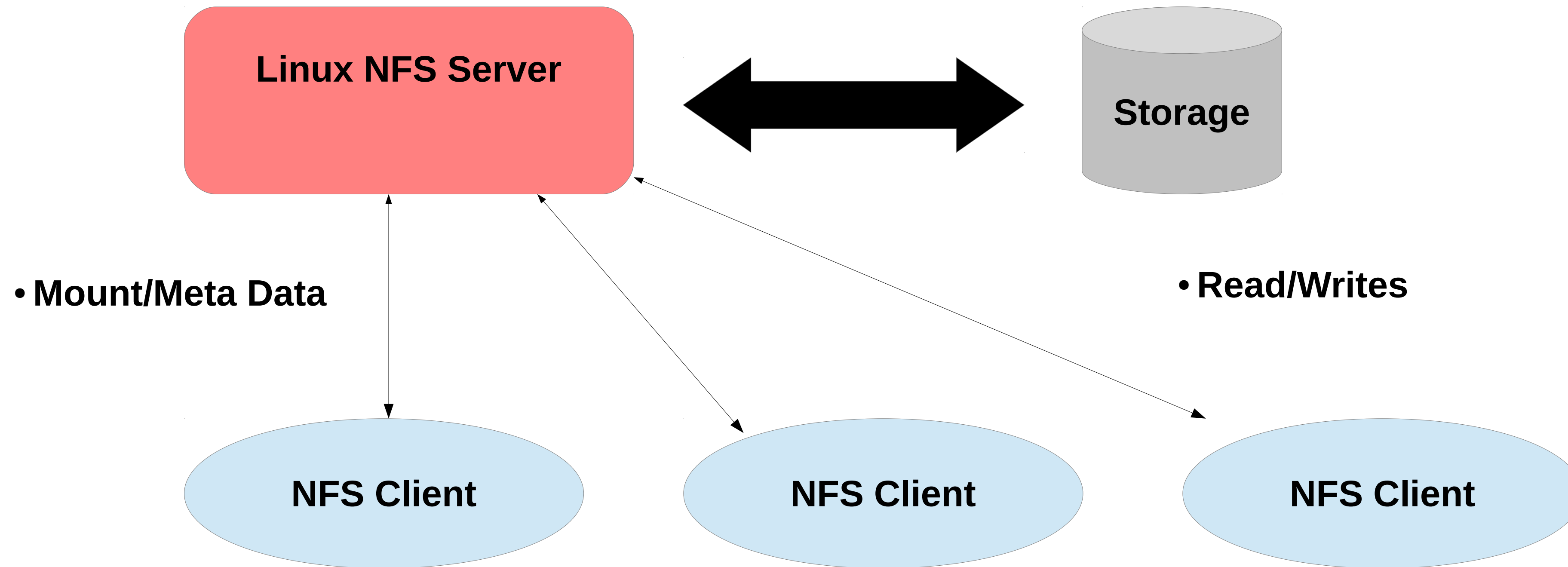
Parallel NFS

WHAT is it (in 6 word or less)??

NFS front end to a Cluster

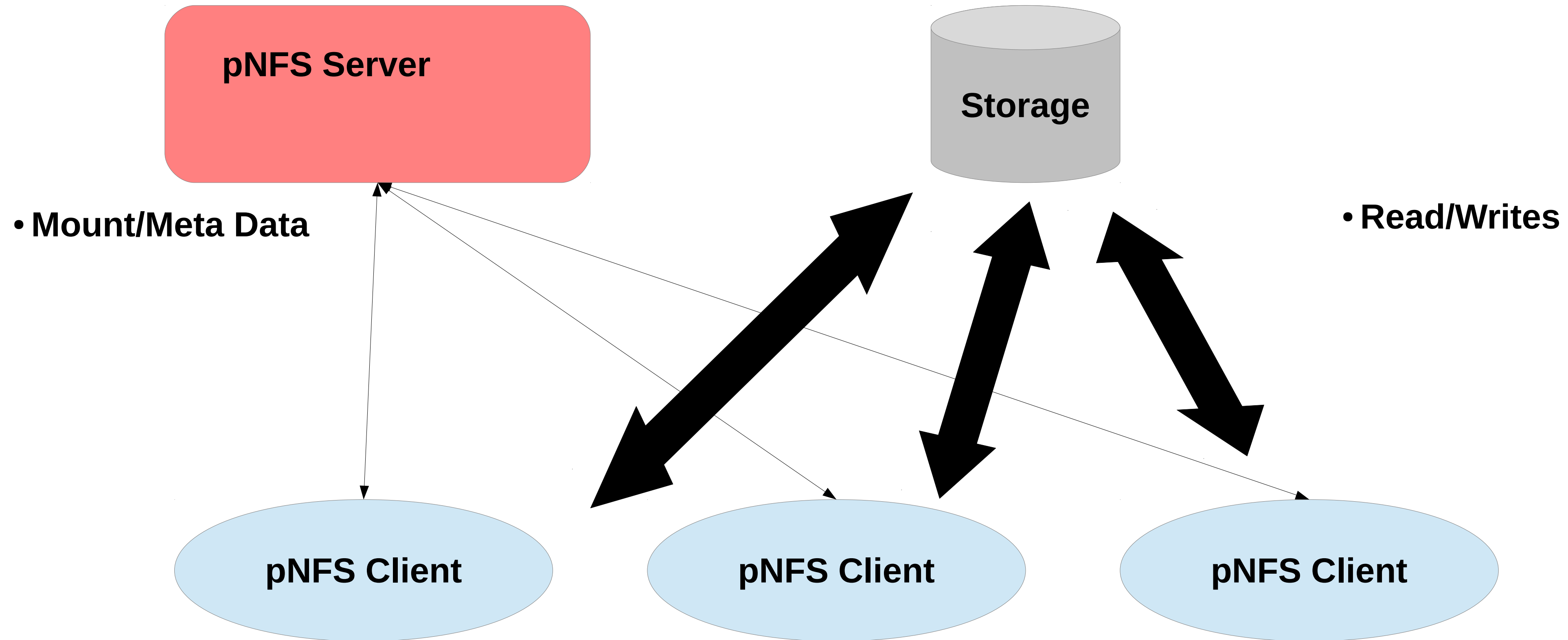
Traditional NFS

One Server for Multiple Clients
= Limited Scalability



Parallel NFS

One Server for Multiple Clients that have direct access
= Scalability



Parallel NFS Layouts

- Normal everyday Cluster

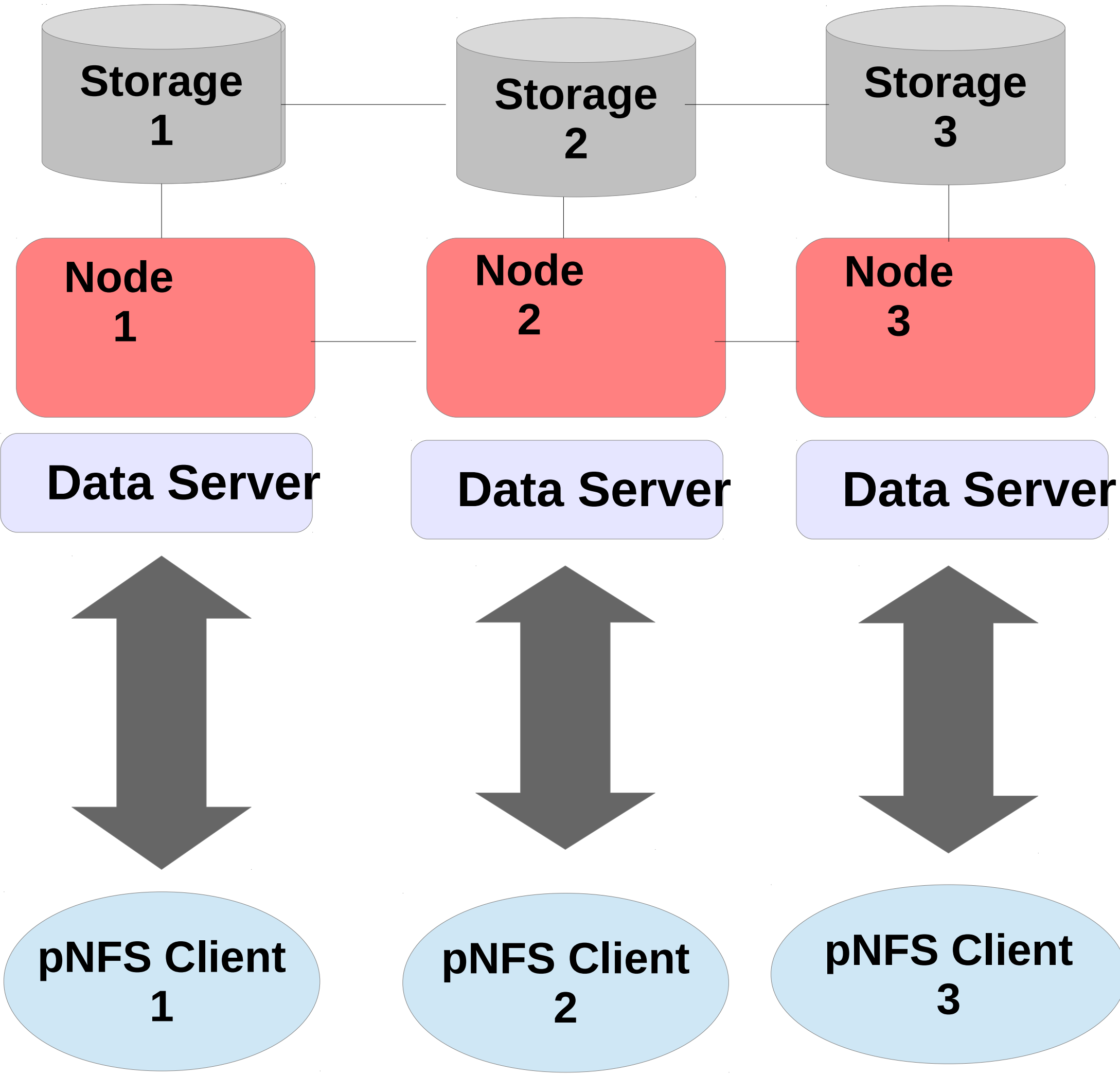
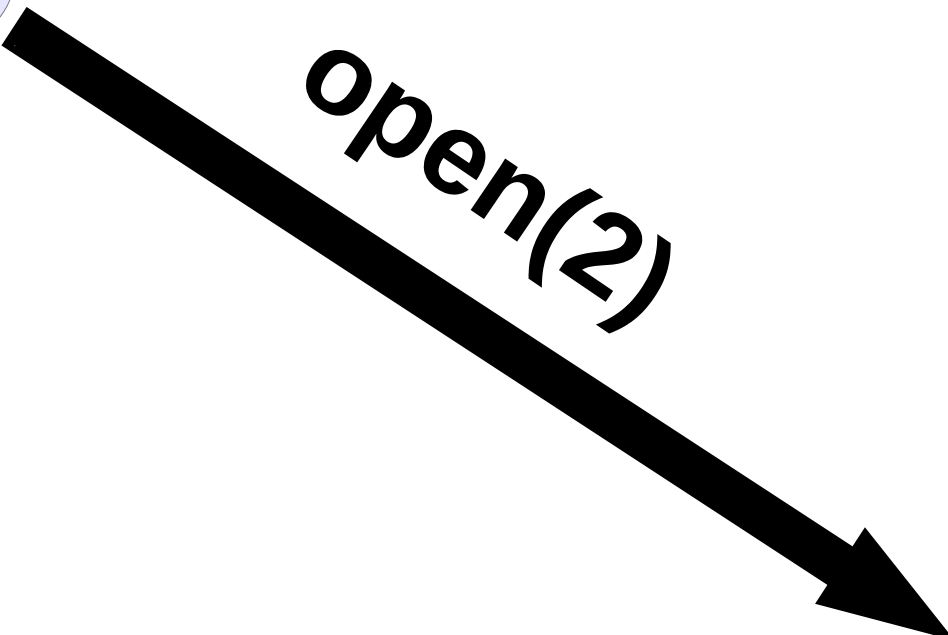
- pNFS

Meta Data Server

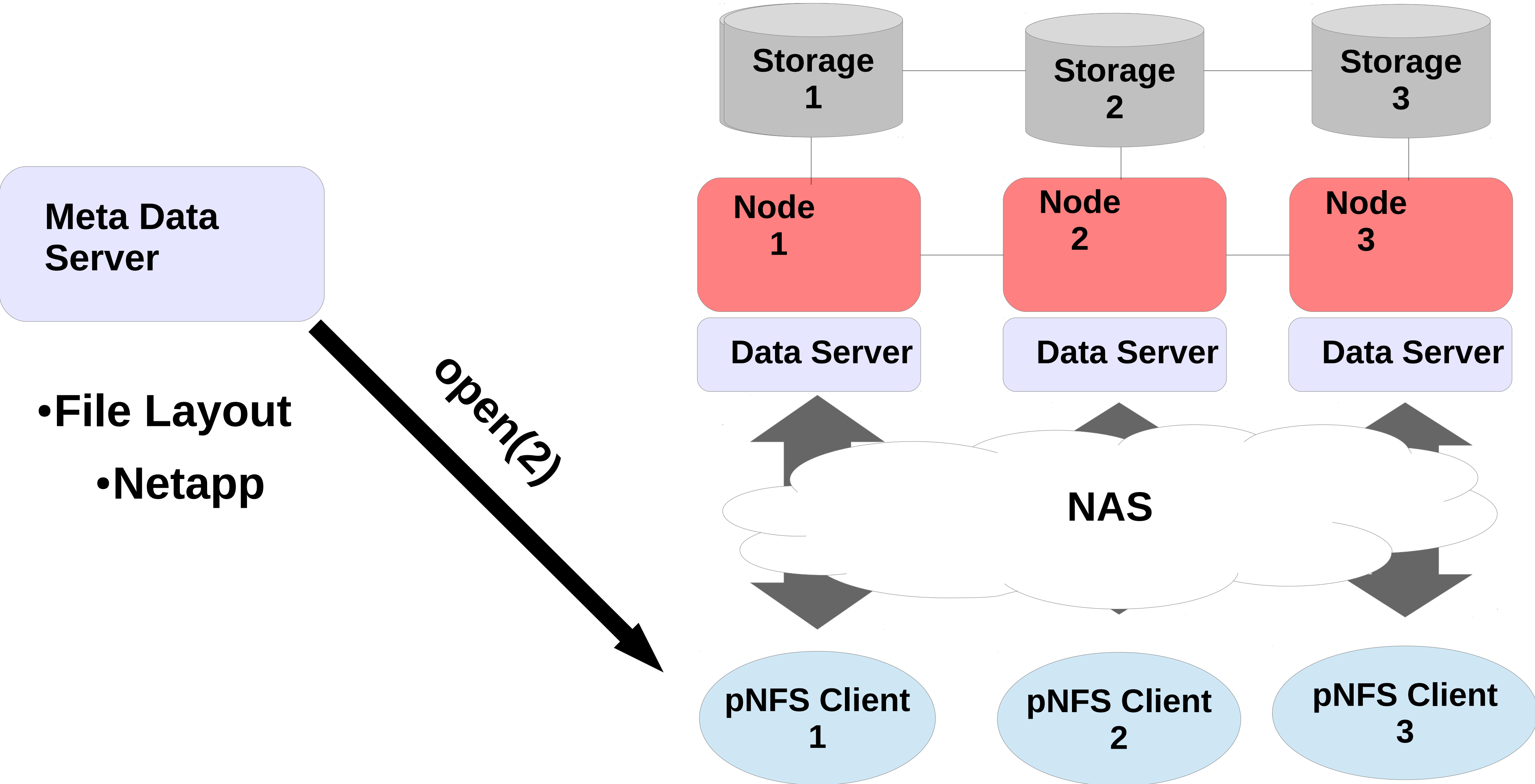
- File Layout

- Object Layout

- Block Layout

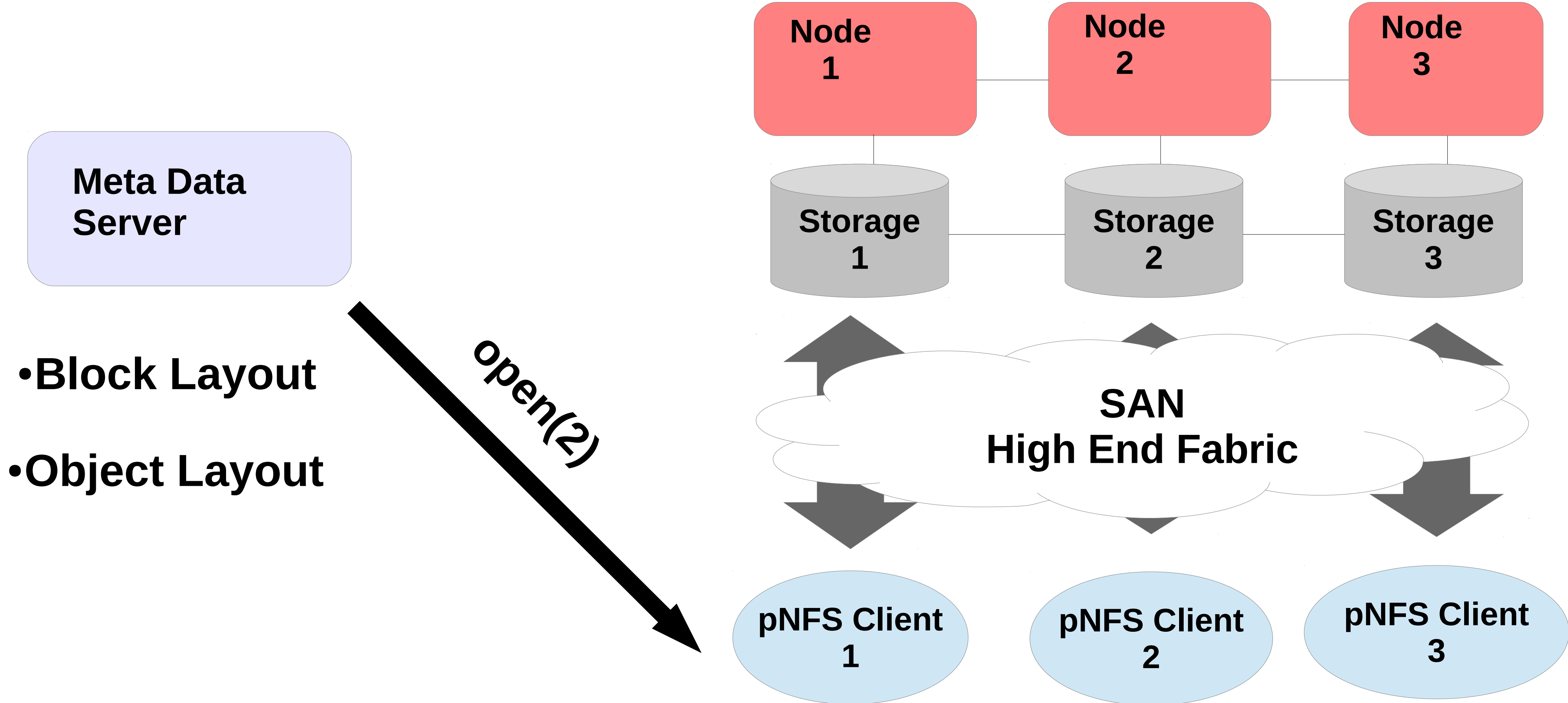


Parallel NFS File Layouts



- File Layout
- Netapp

Parallel NFS Object/Block Layouts



- Block Layout
- Object Layout

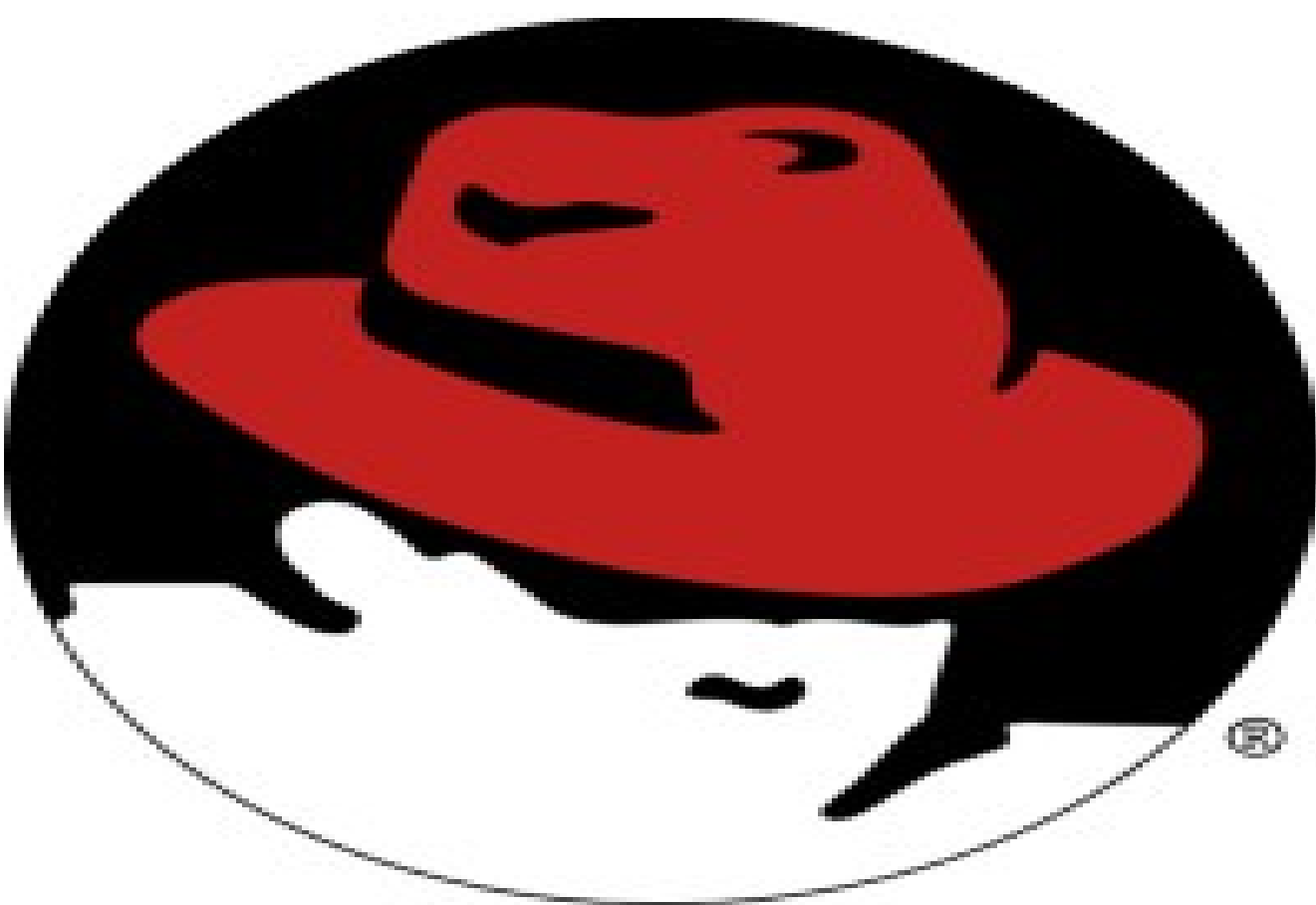


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The Layouts supported in RHEL7

- File Layout
 - Object/Block Layouts – Tech Preview

Industry Leader

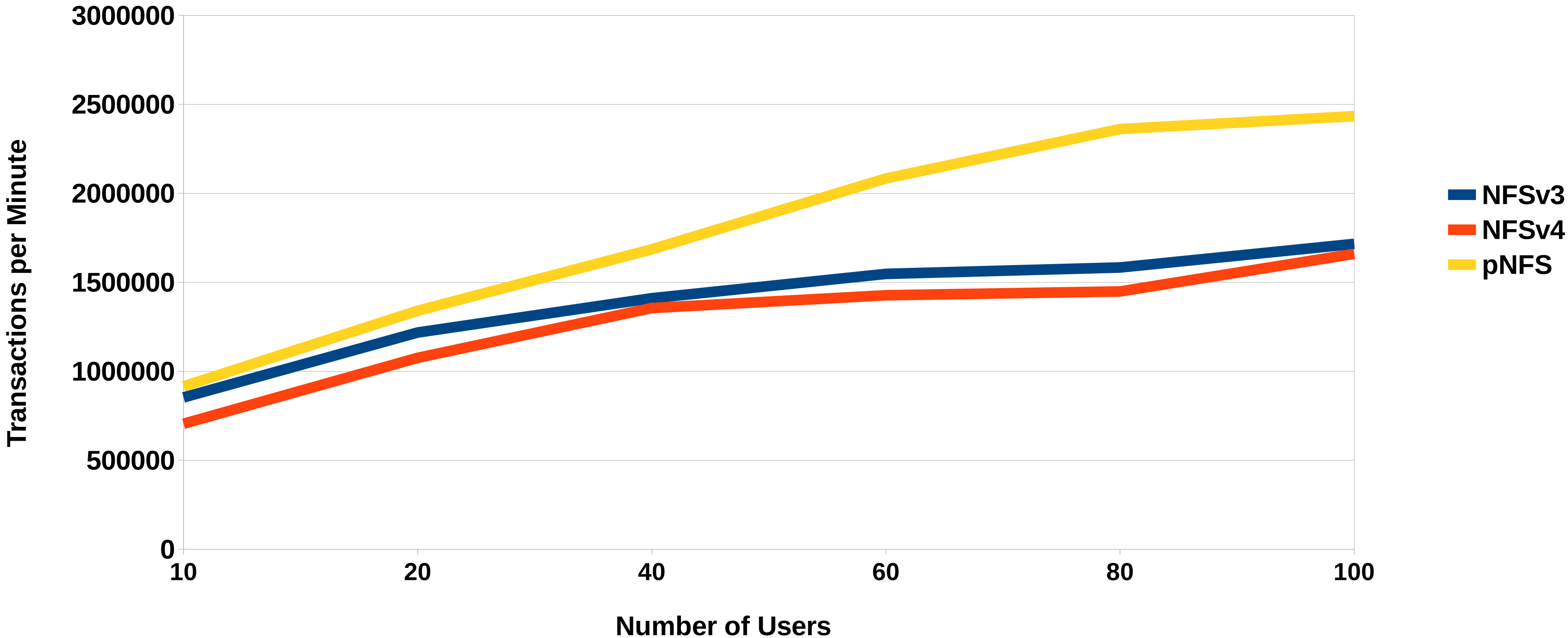


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RHEL7 3.10.0.119 RC1 Kernel OracleR2 OLTP

Netapp 8.2 RC1

- Just over 250k Transactions per min w/ 100 users
- pNFS clients, 2 node cluster
- v4.1 R/W Delegations enabled



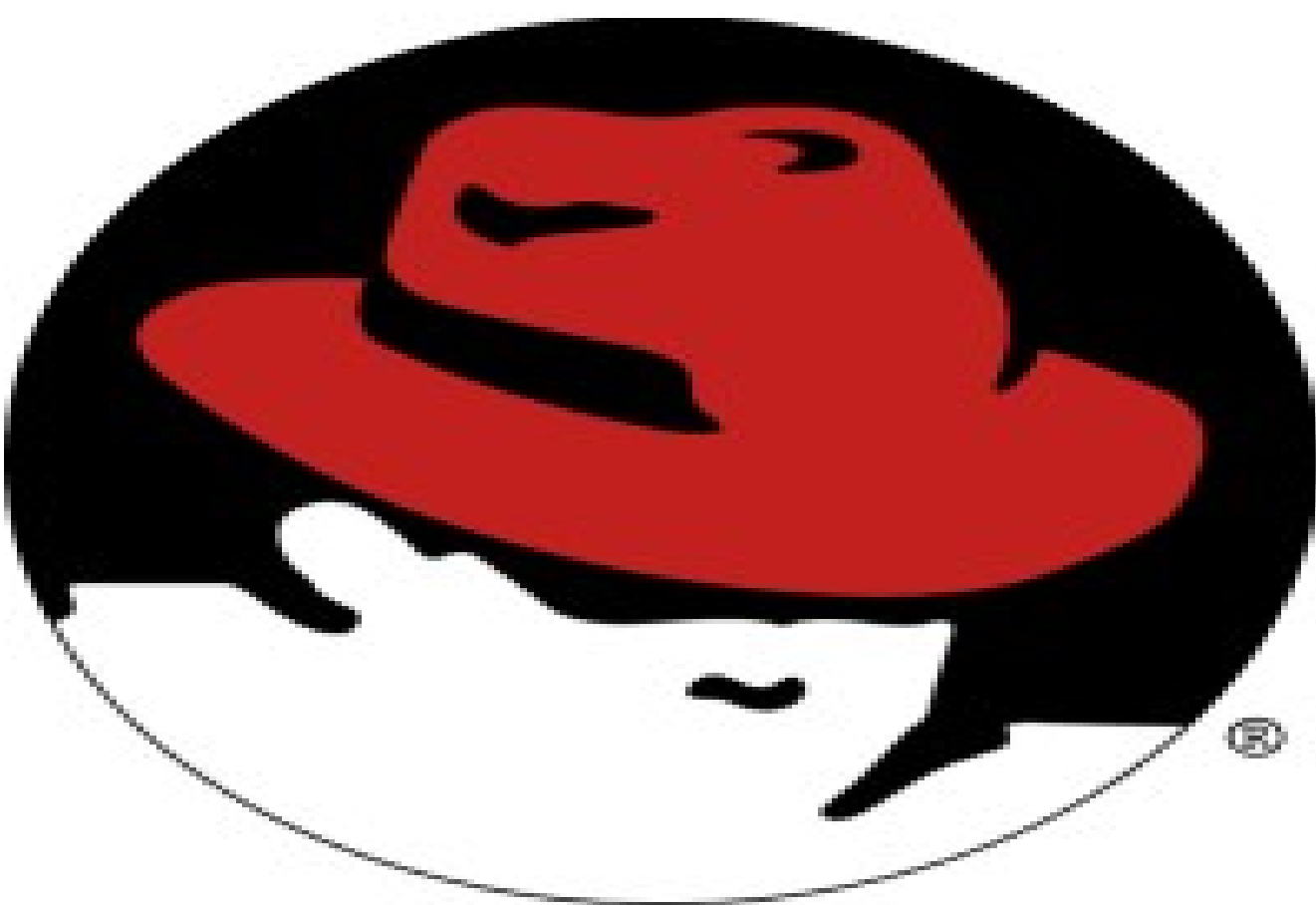


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NFS 4.1 Server Support

- Reliable only-once semantics
- Callback share client tcp connection using port 2049
- No pNFS support :-)





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NFS 4.2 Labeled NFS Selinux context supported

Usages:

Secure virtual machine on NFS servers

Limited access to Home dirs

Industry Leader



Security in RHEL 7 beta by Dan Walsh
Today at 4:50 pm



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Federated File System

What is FedFS???

A way to manage NFS Namespace

What is a NFS Namespace???

A group of NFS v4 referrals

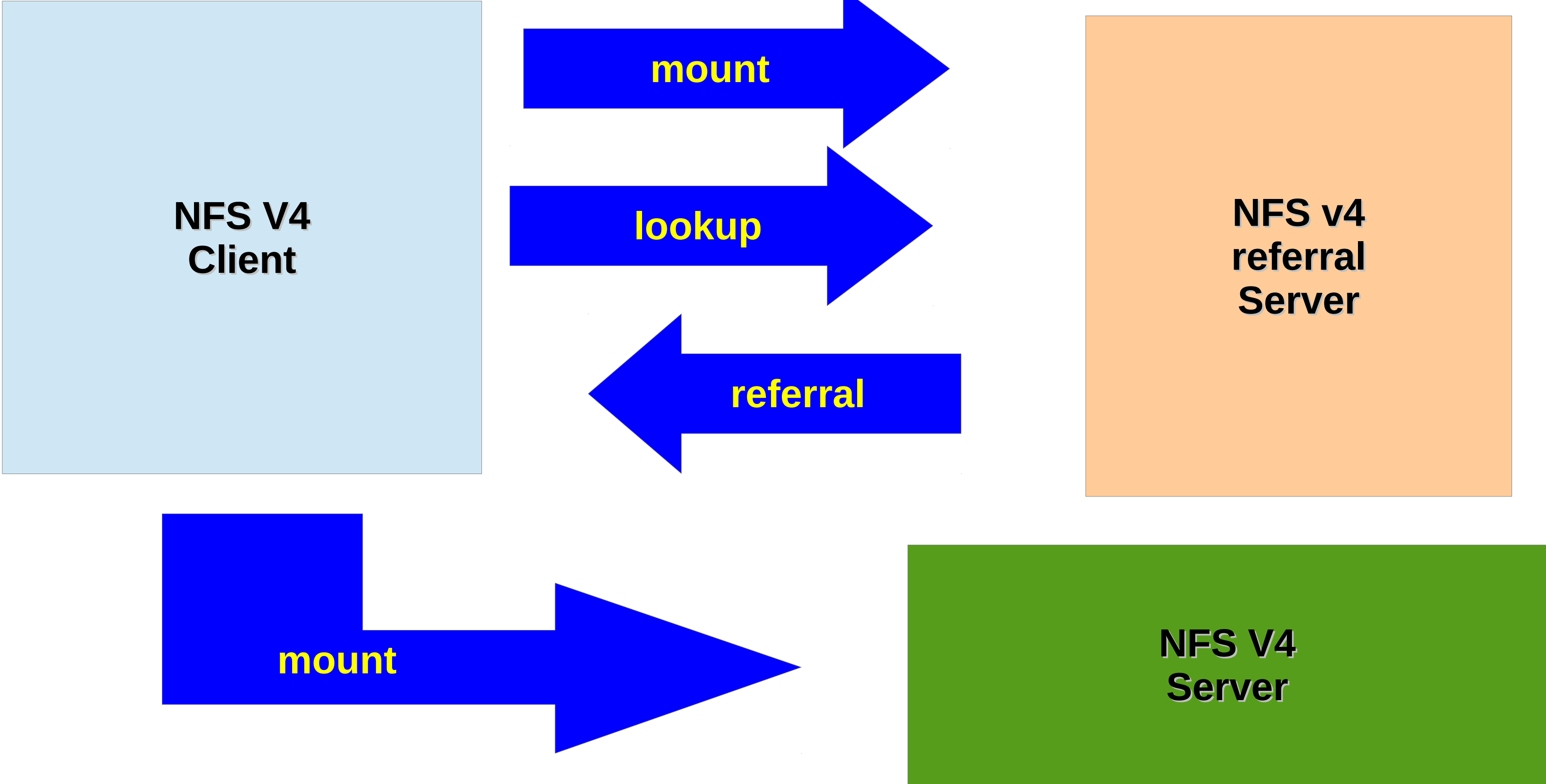
What is an NFS v4 referral???

Let me show you



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NFS V4 Referrals



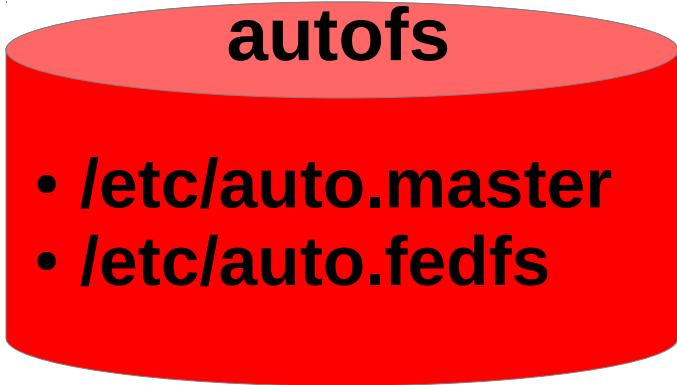


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FedFS Clients & Servers

Clients

- Autofs used to manage mounts
`cd /nfs4/redhat.com/home`



Domain Servers

- DNS or LDAP Is how server is found
- Junctions determine where the mount goes

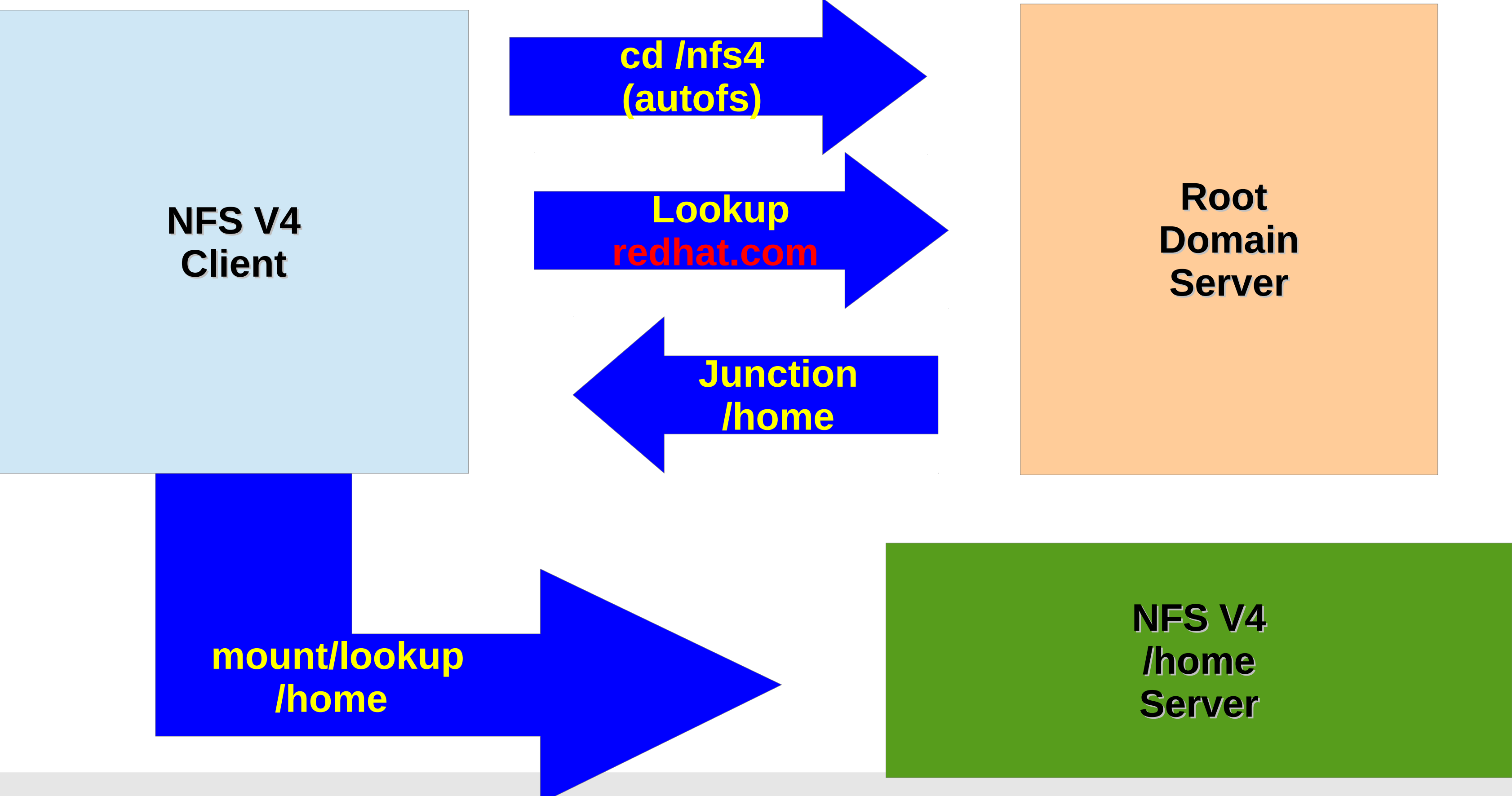




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How FedFS works

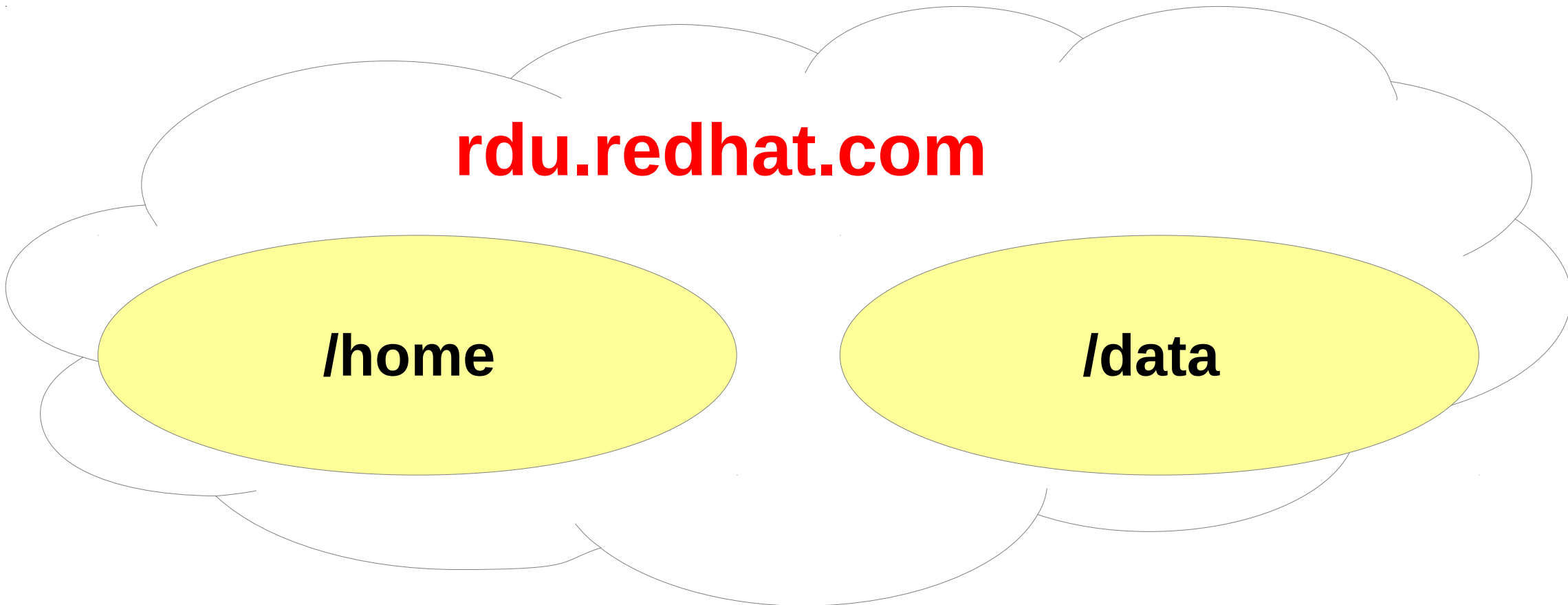
```
cd /nfs4/redhat.com/home
```



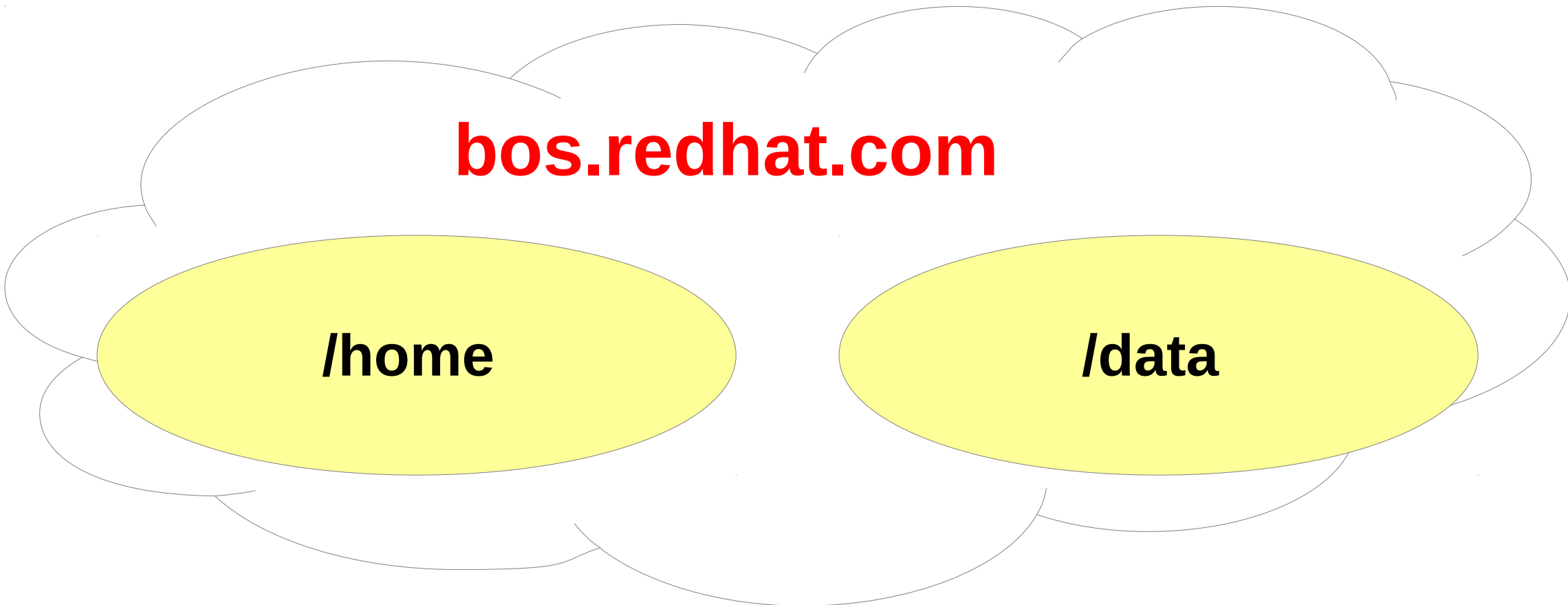


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FedFS Namespaces



```
cd /nfs4/rdu.redhat.com/home
```

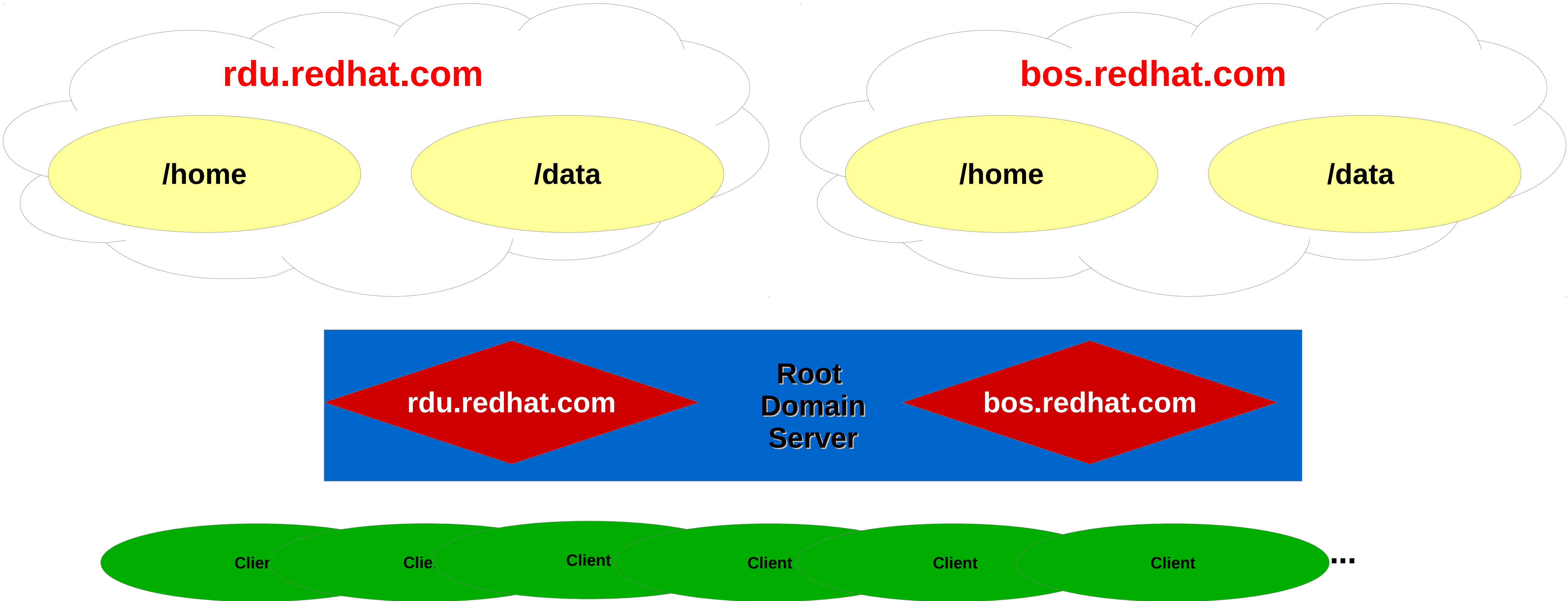


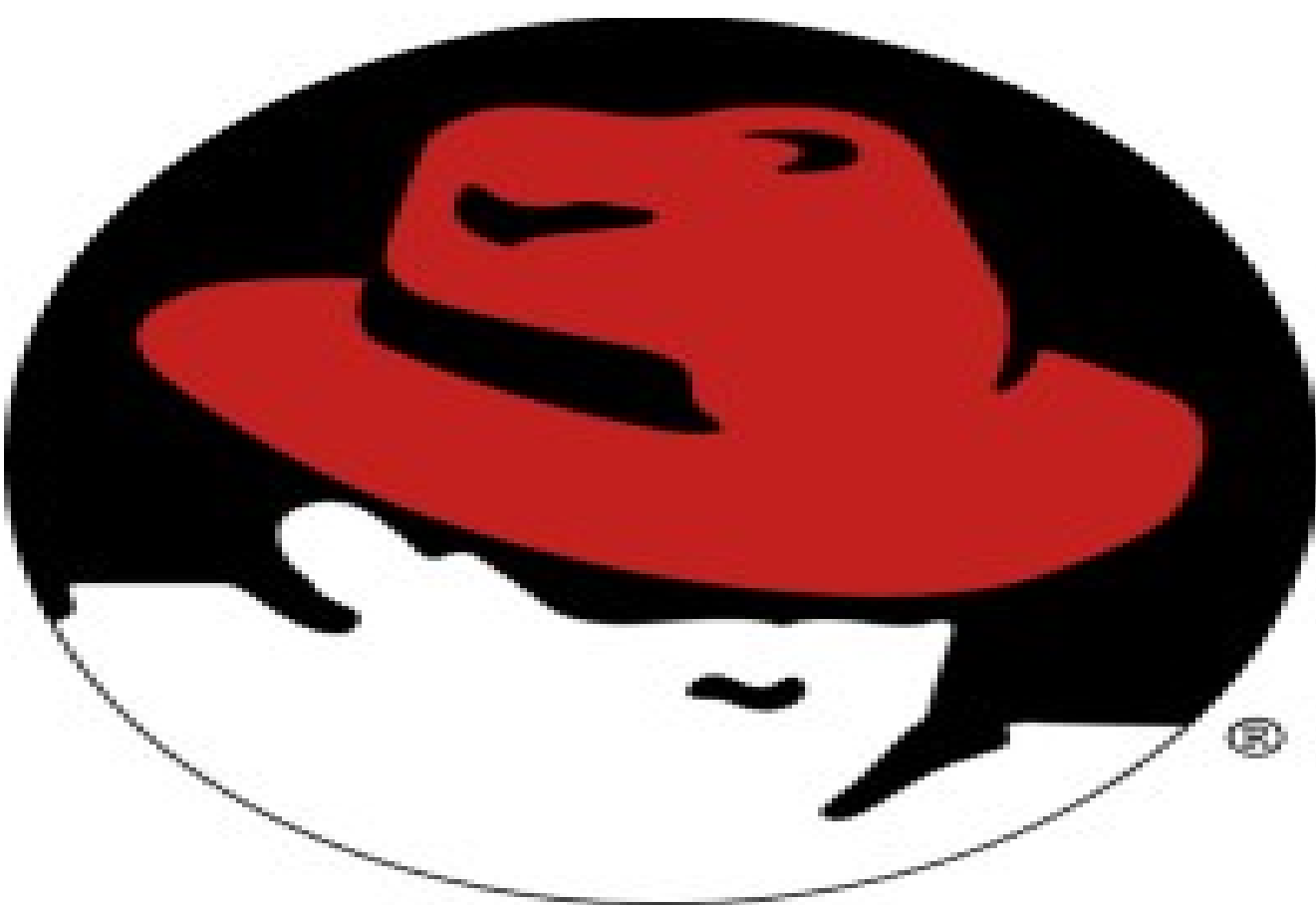
```
cd /nfs4/bos.redhat.com/data
```



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Managing FedFS Namespaces





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Secure NFS

Two Major Pains

Setup

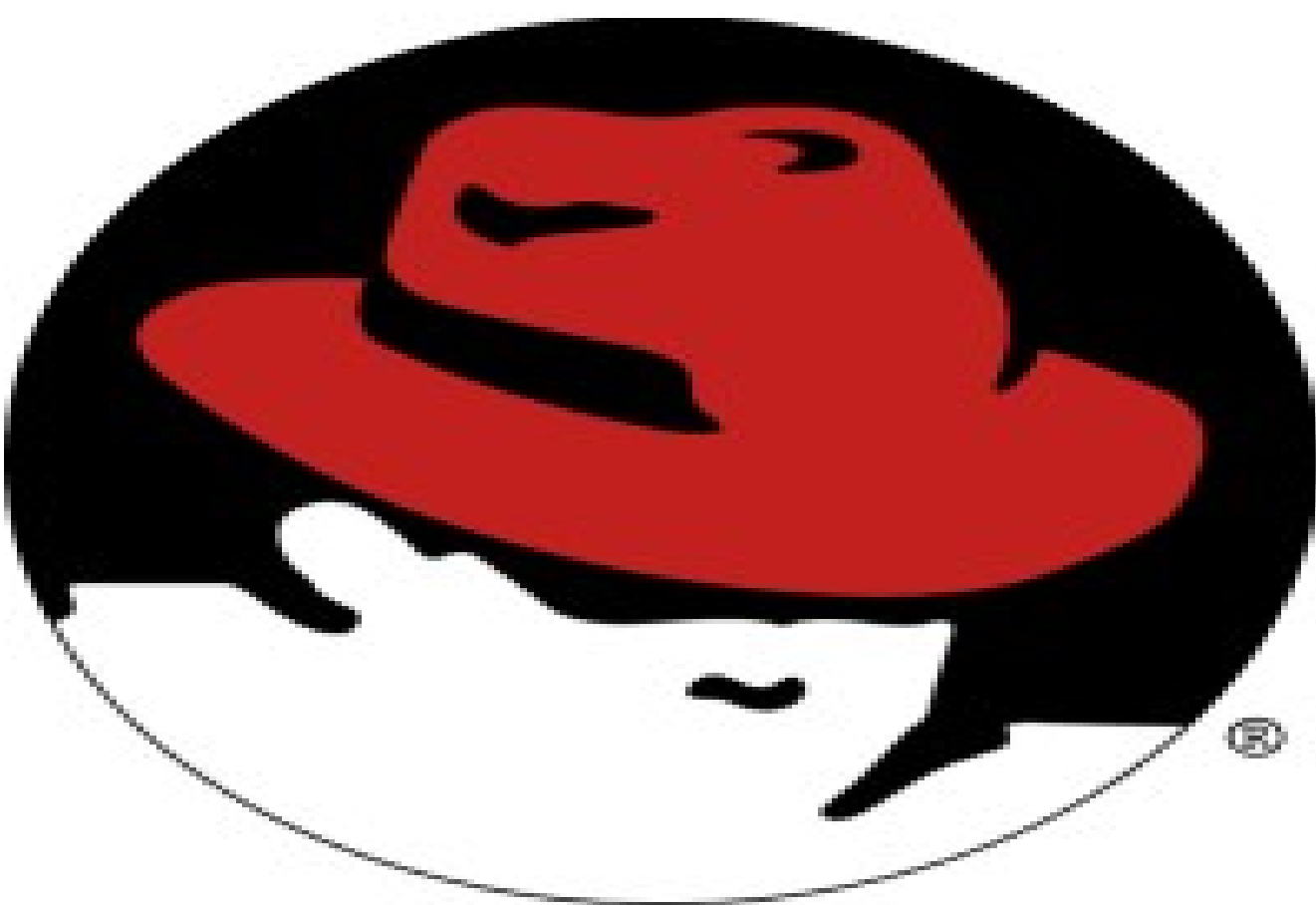


IPA

Ticket Renewal



GSS-proxy



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What is IPA??

Identity

+

Policy

+

Audit

=

IPA





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Ingredients of IPA

Server



ipa-server-install

Client



ipa-client-install





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GSS-Proxy

Keytabs for everybody!!

Which Means:

kinit is no longer needed

Which Also Means:

Long running jobs Solved!!

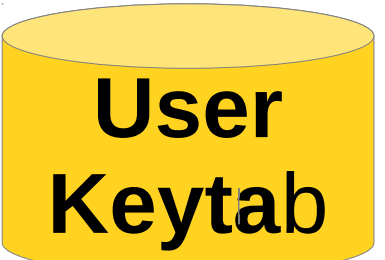
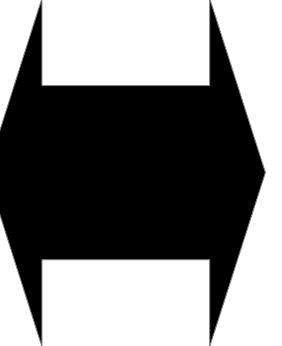
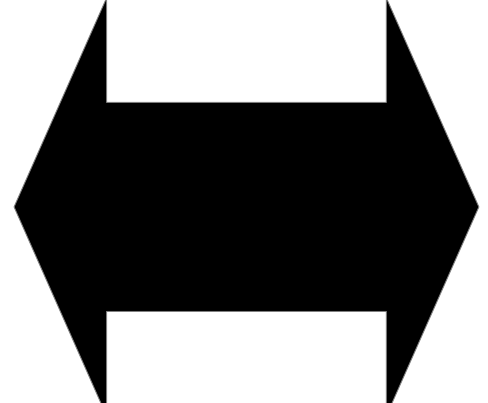
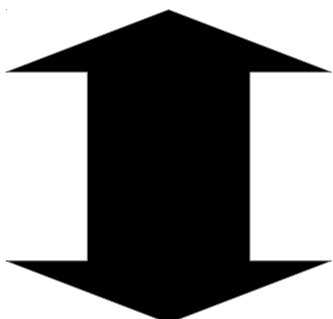
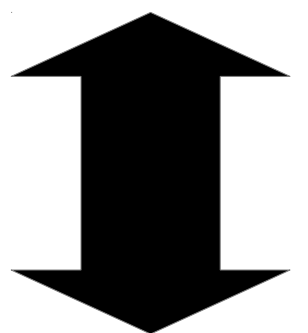


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How GSS-Proxy Works Client



cat /nfs/foobar



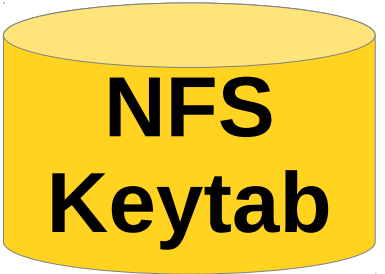


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How GSS-Proxy Works Server

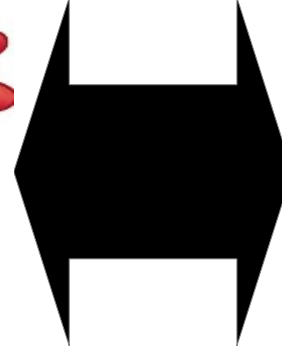
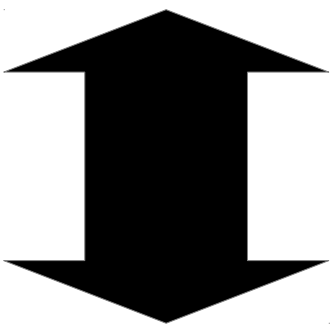
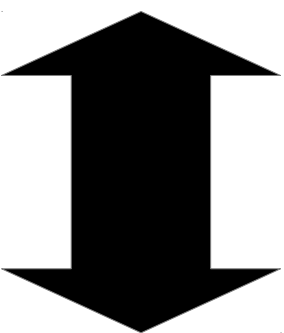


mount server:/nfs/foobar



NFS client

NFS Server



Linux™
NFS Community



Home Page: <http://linux-nfs.org>

Mailing List: linux-nfs@vger.kernel.org

Upstream Bugs: <https://bugzilla.kernel.org/>

Red Hat Bugs: <https://bugzilla.redhat.com>



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