

PVFS2 Roll: Users Guide



Version 4.2.1 Edition



PVFS2 Roll: Users Guide :

Version 4.2.1 Edition

Published Oct 2006

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Table of Contents

Preface	i
1. Overview	1
2. Installing	2
2.1. On a New Server	2
2.2. On an Existing Server.....	2
2.3. Adding the Roll to Nodes.....	3
3. Configuring your PVFS2 Installation	4
3.1. Configuring a Metadata Server.....	4
3.2. Configuring an I/O Server	5
3.3. Configuring Client Nodes.....	7
3.4. Applying the Configuration.....	8
4. Customizing your PVFS2 Installation	9
4.1. Changing the PVFS2 Mountpoint	9
4.2. Changing the Storage Partition Used by a PVFS2 Storage Server	9
A. Rocks Copyright	11
B. Third Party Copyrights and Licenses	12
B.1. PVFS2.....	12

List of Tables

1-1. Summary..... 1
1-2. Roll Compatibility 1

Preface

The Rocks PVFS2 Roll contains packages, installation scripts and tools to help users deploy a PVFS2 instance on their cluster.

Chapter 1. Overview

Table 1-1. Summary

Name	pvfs2
Version	4.2.1
Maintained By	Rocks Group
Architecture	i386, x86_64, ia64
Compatible with Rocks	4.2.1

Table 1-2. Roll Compatibility

Roll	Requires ^a	Optional ^b	Conflicts
area51		X	
base	X		
bio		X	
condor		X	
ganglia		X	
grid		X	
hpc	X		
java		X	
kernel	X		
os (disk 1)	X		
os (disk 2)	X		
os (disk 3)		X	
os (disk 4)		X	
pbs		X	
service-pack	X		
sge		X	
viz		X	
web-server	X		

Notes:

- a. You may also substitute your own OS CDs for the Rocks OS Roll CDs. In this case you must use all the CDs from your distribution and not use any of the Rocks OS Roll CDs.
- b. Only Rolls that have been verified as compatible with this Roll are listed. Other Rolls will likely work, but have not been tested by the maintainer of this Roll.

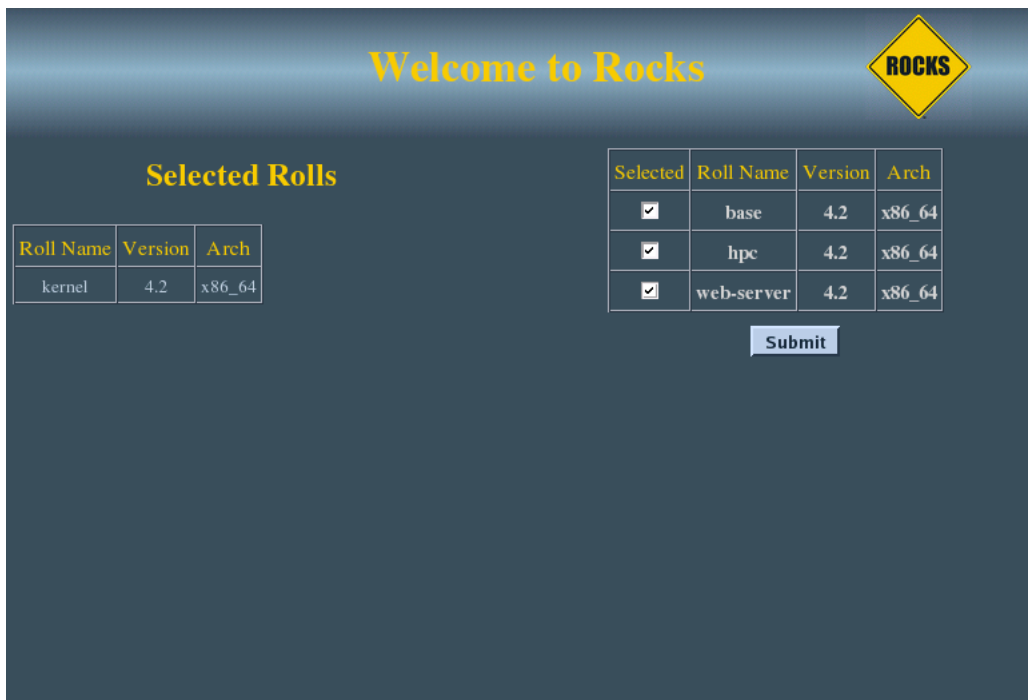
Chapter 2. Installing



The PVFS2 Roll requires that the Service Pack Roll be installed first. See the Service Pack Roll documentation for instructions on how to install the Service Pack Roll.

2.1. On a New Server

The pvfs2 Roll should be installed during the initial installation of your server (or cluster). This procedure is documented in section 1.2 of the Rocks usersguide. You should select the pvfs2 Roll from the list of available rolls when you see a screen similar to the one below.



2.2. On an Existing Server

The PVFS2 Roll can be installed on running frontend.

The following procedure will install the roll on the frontend. After the frontend reboots, the roll will be fully configured.

For i386, as root, execute:

```
# roll-install http://www.rocksclusters.org/ftp-site/pub/rocks/rocks-4.2.1/pvfs2-4.2.1-1.i386.disk1.
```

For `x86_64`, execute:

```
# roll-install http://www.rocksclusters.org/ftp-site/pub/rocks/rocks-4.2.1/pvfs2-4.2.1-1.x86_64.disk
```

If your frontend doesn't have access to the outside internet, download the roll-install package and PVFS2 Roll ISO image and execute:

```
# roll-install pvfs2-4.2.1-1.<arch>.disk1.iso
```

Substitute `i386` or `x86_64` for `<arch>` based on the version of Rocks you installed.

The PVFS2 requires more manual steps after the above completes. This step is necessary as it adds a table to database and that procedure requires the root password. To complete the installation, as root execute:

```
# mysql -u root -p cluster < /tmp/pvfs2.sql
```

Now you need to install the PVFS2 again:

```
# roll-install pvfs2-4.2.1-1.<arch>.disk1.iso
```

Substitute `i386` or `x86_64` for `<arch>` based on the version of Rocks you installed.

Then reboot:

```
# init 6
```

2.3. Adding the Roll to Nodes

To add the the PVFS2 Roll to the nodes of your cluster, you'll need to reinstall the nodes.

To reinstall all your nodes, as root execute:

```
# tentakel '/boot/kickstart/cluster-kickstart'
```


Chapter 3. Configuring your PVFS2 Installation

3.1. Configuring a Metadata Server

After you install PVFS2 on your frontend, you need to specify a PVFS2 Metadata Server. A PVFS2 Metadata Server holds all the information about the files stored in a PVFS2 file system (for example, creation time, owner, group, size, etc.).

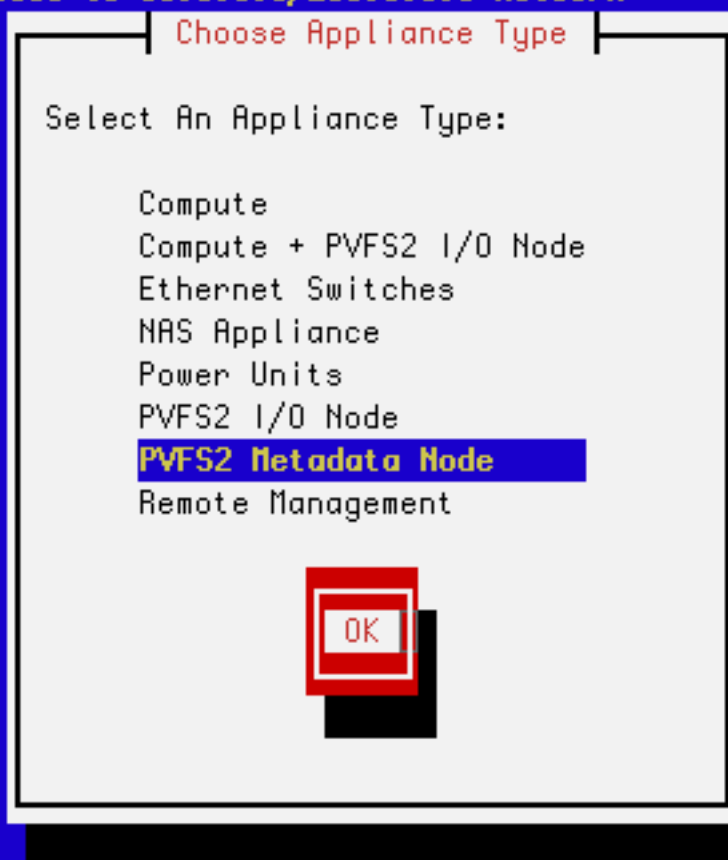


By default, the frontend is configured to be the PVFS2 Metadata Server.

Therefore, if you don't want to specify a different node in your cluster to be the PVFS2 Metadata Server, then you can skip this step.

If you wish to make one of the nodes in your cluster the PVFS2 Metadata Server, then you'll need to run `insert-ethers` and select *PVFS2 Metadata Node*.

```
Insert Ethernet Addresses -- version 4.2.1
Opened kickstart access to 10.0.0.0/255.0.0.0 network
```

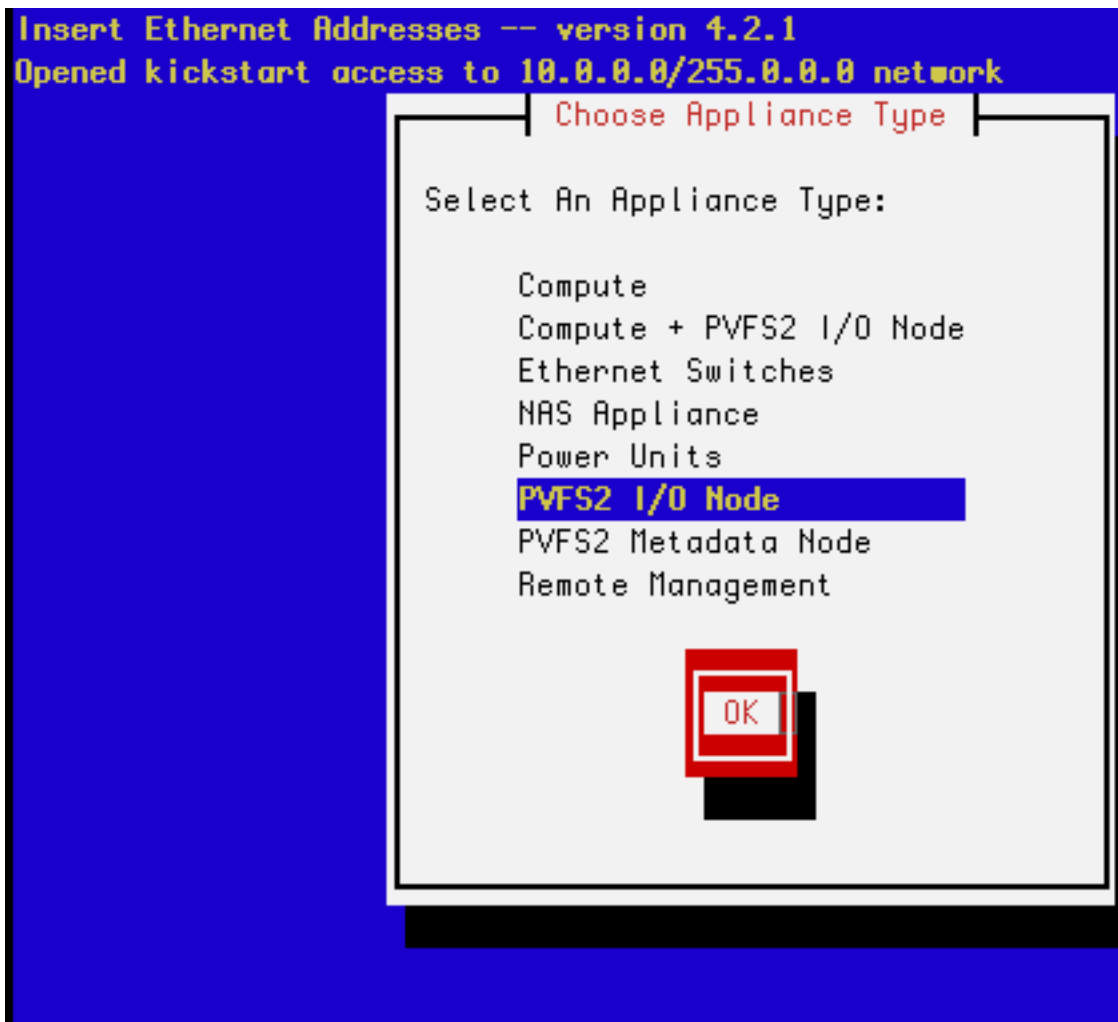


Then PXE boot the node you wish to be the PVFS2 Metadata Server (you can also boot the node with the Rocks Boot CD).

3.2. Configuring an I/O Server

After you install PVFS2 on your frontend, you need to specify at least one PVFS2 I/O Node. A PVFS2 I/O Node holds data blocks for PVFS2.

To make one of the nodes in your cluster a PVFS2 I/O Node, you'll need to run `insert-ethers` and select *PVFS2 I/O Node*.



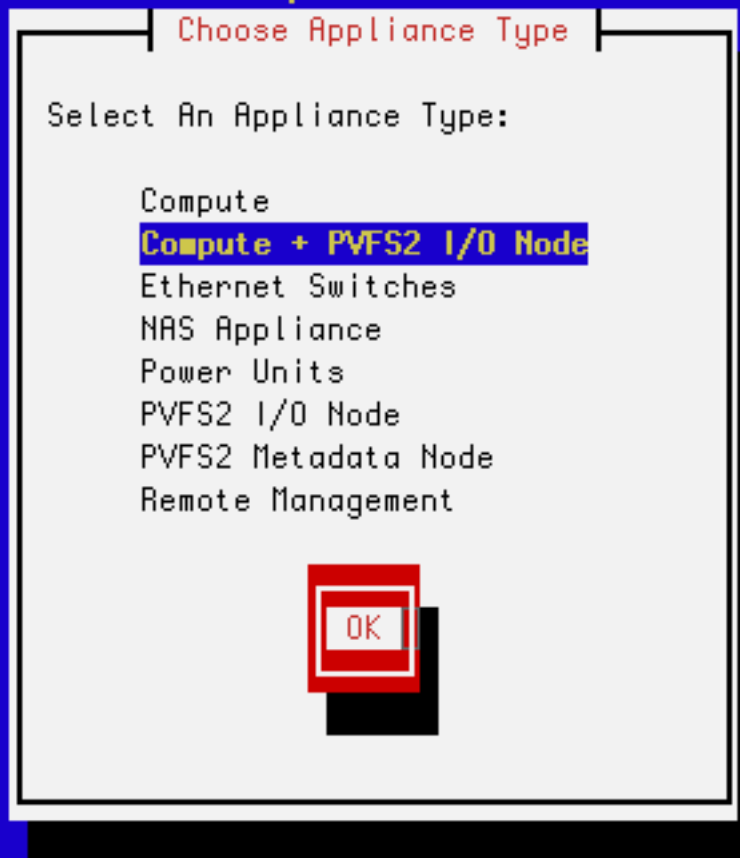
Then PXE boot the node you wish to be a PVFS2 I/O Node (you can also boot the node with the Rocks Boot CD).

3.2.1. Configuring a Hybrid I/O Server

You can also specify a *hybrid* node that will be configured as a PVFS2 I/O Node *and* a Compute Node. Nodes that are in this configuration will serve PVFS2 blocks as well as have user jobs scheduled on them (e.g., SGE or PBS will schedule jobs on this node).

To make one of the nodes in your cluster a Compute + PVFS2 I/O Node, you'll need to run `insert-ethers` and select *Compute + PVFS2 I/O Node*.

```
Insert Ethernet Addresses -- version 4.2.1
Opened kickstart access to 10.0.0.0/255.0.0.0 network
```



Installing *Compute + PVFS2 I/O Node* nodes is highly discouraged.

This is because user jobs will be scheduled on *Compute + PVFS2 I/O* nodes and user jobs have been known to crash nodes. When a *PVFS2 I/O Node* crashes, the entire *PVFS2* file system will be offline.

Then PXE boot the node you wish to be a *Compute + PVFS2 I/O Node* (you can also boot the node with the *Rocks Boot CD*).

3.3. Configuring Client Nodes

After you install your *PVFS2 I/O Nodes* and optionally a *PVFS2 Metadata Server*, you need to reinstall all your client nodes (e.g., your *compute nodes*). This will install the *PVFS2* client software on the nodes so each node can

mount the PVFS2 file system.

To reinstall your compute nodes, as root execute:

```
# tentakel -g compute /boot/kickstart/cluster-kickstart
```

3.4. Applying the Configuration

After you install your PVFS2 I/O Nodes and optionally a PVFS2 Metadata Server and after you've reinstalled all your client nodes, you need to apply the new configuration to the cluster. To do this, execute:

```
# /opt/pvfs2/sbin/pvfs2-reconfig
```

This responds with:

```
When you run this program, it will REMOVE the
previous PVFS2 installation. That is, all data
stored in the previous PVFS2 installation will
be LOST.
```

```
Are you sure you want to run this program?
Type YES to run this program:
```



If you answer *YES* and if you had a previous instance of PVFS2 running on your cluster, all data from the previous instance will be lost.

If you answer 'YES', then the following will occur:

- PVFS2 configuration files will be generated and sent to each PVFS2 I/O Node and the PVFS2 Metadata Server.
- The PVFS2 server process will be restarted on each PVFS2 I/O Node and the PVFS2 Metadata Server.
- The PVFS2 mount point name will be sent to all nodes in the cluster.
- All nodes in the cluster will mount the PVFS2 file system.

The default mountpoint is `/mnt/pvfs2`. So to test your installation, execute:

```
# ls /mnt/pvfs2
```

You can also run the above command on some client nodes to see if `/mnt/pvfs2` mounted.

Chapter 4. Customizing your PVFS2 Installation

4.1. Changing the PVFS2 Mountpoint

The default PVFS2 mountpoint is `/mnt/pvfs2`. To change it, edit the file `/opt/pvfs2/conf/variables`, and change the value:

```
PVFS2_MOUNTPOINT=/mnt/pvfs2
```

For example, to change the mountpoint to `/my/mount`, the line above should look like:

```
PVFS2_MOUNTPOINT=/my/mount
```

After you modify the file above, you must apply the change to the cluster -- see the section Applying the Configuration for details.

4.2. Changing the Storage Partition Used by a PVFS2 Storage Server

The default partition used by PVFS2 storage servers (PVFS2 I/O Nodes and the PVFS2 Metadata Server) is `/state/partition1`. To change it, you'll need to run the program `/opt/pvfs2/sbin/rocks-pvfs2-partition`.

To check which partition a node is using, run the command:

```
# /opt/pvfs2/sbin/rocks-pvfs2-partition --list --nodename pvfs2-io-0-0
```

This will produce output like:

```
pvfs2-io-0-0 has the following assigned PVFS2 partitions:  
    /state/partition1
```

To change the partition to `/mydata`, execute the command:

```
# /opt/pvfs2/sbin/rocks-pvfs2-partition --add /mydata --nodename pvfs2-io-0-0
```

If you make a mistake and wish to delete a partition, execute the command:

```
# /opt/pvfs2/sbin/rocks-pvfs2-partition --delete /mydata --nodename pvfs2-io-0-0
```

After you modify the PVFS2 partition info for a storage node, you must apply the change to the cluster -- see the section *Applying the Configuration* for details.

At this time, only one partition per storage node is supported. If you specify more than one partition per storage node, the first partition listed will be the partition used.

Appendix A. Rocks Copyright

Rocks
www.rocksclusters.org
version 4.2.1 (Cydonia)

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B.1. PVFS2

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Version 2.1, February 1999

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```

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```
*****
NOTE: The pvfs2 kernel modules for 2.4.x and 2.6.x are released under
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*****
```

Notes

1. <http://cvs.rocksclusters.org>