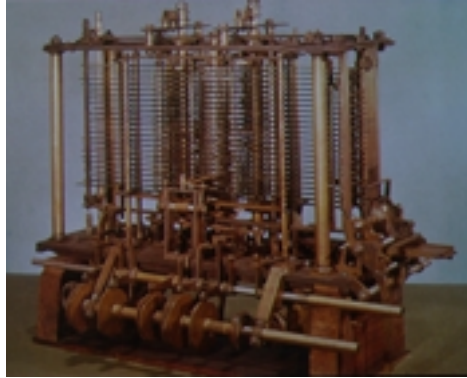
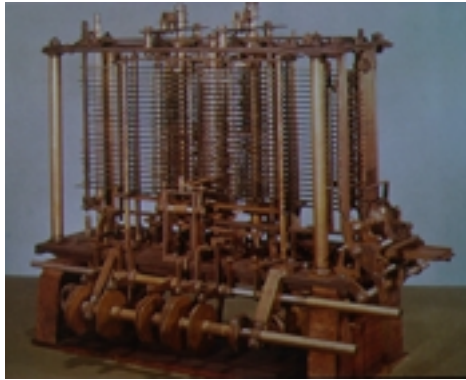


# HPC Roll: Users Guide



**Version 5.4 Edition**



**HPC Roll: Users Guide :**

Version 5.4 Edition

Published Nov 02 2010

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# Preface

The primary purpose of the HPC Roll is to provide configured software tools that can be used to run parallel applications on your cluster.

The following software packages are included in the HPC Roll:

- MPI over ethernet environments (OpenMPI, MPICH, MPICH2)
- PVM
- Benchmarks (stream, iperf, IOzone)

# Chapter 1. Overview

**Table 1-1. Summary**

Name	hpc
Version	5.4
Maintained By	Rocks Group
Architecture	i386, x86_64
Compatible with Rocks®	5.4

**Table 1-2. Roll Compatibility**

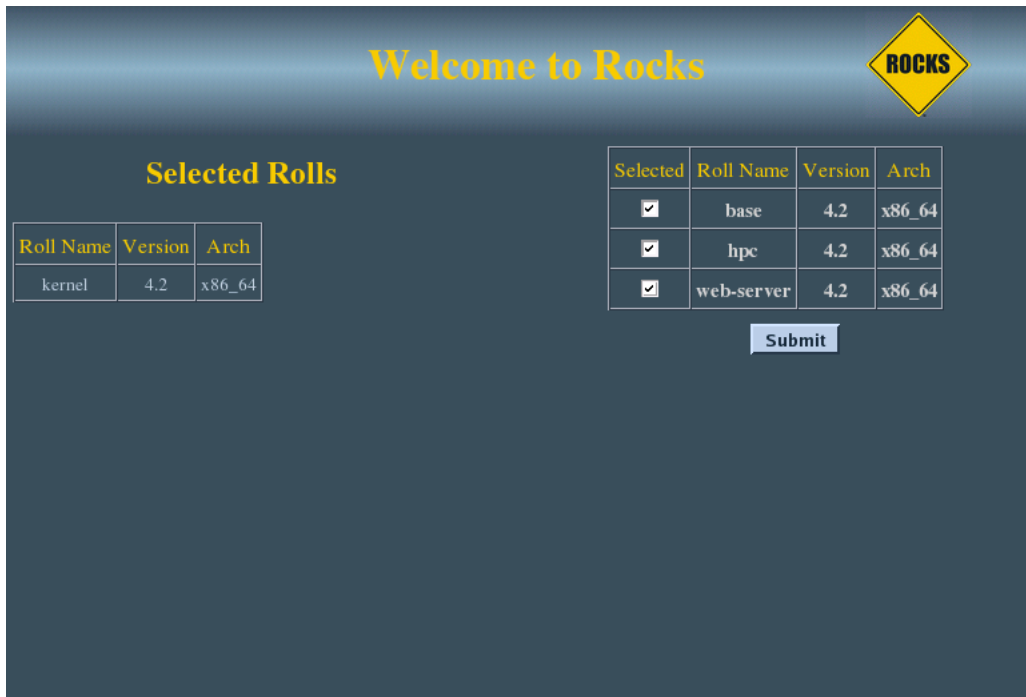
Roll	Requires <sup>a</sup>	Optional <sup>b</sup>	Conflicts
alpha		X	
area51		X	
base	X		
bio		X	
condor		X	
ganglia		X	
grid		X	
hpc		X	
java		X	
kernel	X		
os (disk 1)	X		
os (disk 2)	X		
os (disk 3)		X	
os (disk 4)		X	
os (disk 5)		X	
os (disk 6)		X	
os (disk 7)		X	
pbs		X	
service-pack		X	
sge		X	
viz		X	
web-server		X	
xen		X	

<b>Roll</b>	<b>Requires <sup>a</sup></b>	<b>Optional <sup>b</sup></b>	<b>Conflicts</b>
<p>Notes:</p> <ul style="list-style-type: none"><li>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.</li><li>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.</li></ul>			

# Chapter 2. Installing

## 2.1. On a New Server

The hpc 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 hpc Roll from the list of available rolls when you see a screen that is similar to the one below.



## 2.2. On an Existing Server

The hpc Roll may also be added onto an existing server (or frontend). For sake of discussion, assume that you have an iso image of the roll called `hpc.iso`. The following procedure will install the Roll, and after the server reboots the Roll should be fully installed and configured.

```
$ su - root
# rocks add roll hpc.iso
# rocks enable roll hpc
# cd /export/rocks/install
# rocks create distro
# rocks run roll hpc | bash
# init 6
```



# Chapter 3. Using

## 3.1. Using mpirun from OpenMPI

To interactively launch a test OpenMPI program on two processors:

- Create a file in your home directory named `machines`, and put two entries in it, such as:

```
compute-0-0
compute-0-1
```

- Now launch the job from the frontend:

```
$ ssh-agent $SHELL
$ ssh-add
$ /opt/openmpi/bin/mpirun -np 2 -machinefile machines /opt/mpi-tests/bin/mpi-ring
```



You must run MPI programs as a regular user (that is, not root).

If you don't have a user account on the cluster, create one for yourself, and propagate the information to the compute nodes with:

```
# useradd username
# rocks sync users
```

## 3.2. Using mpirun from MPICH

To interactively launch a test MPICH program on two processors:

- Create a file in your home directory named `machines`, and put two entries in it, such as:

```
compute-0-0
compute-0-1
```

- Compile a test program using the MPICH environment:

```
$ cd $HOME
$ mkdir mpich-test
$ cd mpich-test
$ cp /opt/mpi-tests/src/mpi-ring.c .
$ /opt/mpich/gnu/bin/mpicc -o mpi-ring mpi-ring.c -lm
```

- Now launch the job from the frontend:

```
$ ssh-agent $SHELL
$ ssh-add
$ /opt/mpich/gnu/bin/mpirun -nolocal -np 2 -machinefile $HOME/machines \
  $HOME/mpich-test/mpi-ring
```



You must run MPI programs as a regular user (that is, not root).

If you don't have a user account on the cluster, create one for yourself, and propagate the information to the compute nodes with:

```
# useradd username  
# rocks sync users
```

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www.rocksclusters.org  
version 5.4 (Maverick)

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Distributed Applications Support Team

Iperf Copyright

-----  
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Iperf performance test <<http://dast.nlanr.net/Projects/Iperf>>  
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## B.6. PVM

PVM version 3.4: Parallel Virtual Machine System  
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Oak Ridge National Laboratory, Oak Ridge TN.  
Emory University, Atlanta GA.  
Authors: J. J. Dongarra, G. E. Fagg, M. Fischer  
G. A. Geist, J. A. Kohl, R. J. Manchek, P. Mucci,  
P. M. Papadopoulos, S. L. Scott, and V. S. Sunderam  
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