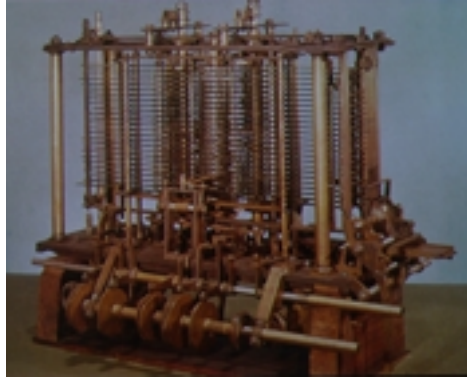
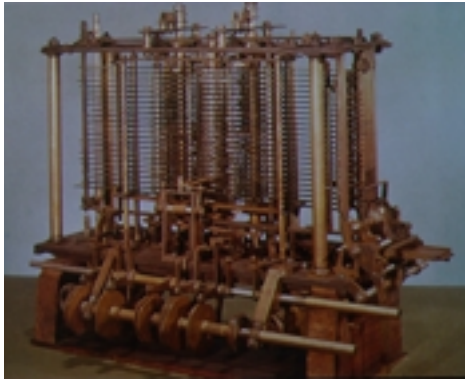


HPC Users Guide



5.4.3 Edition



HPC Users Guide :

5.4.3 Edition

Published Aug 09 2011

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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	5.4.3
Maintained By	Rocks Group
Architecture	i386, x86_64
Compatible with Rocks®	5.4.3

The hpc roll has the following requirements of other rolls. Compatibility with all known rolls is assured, and all known conflicts are listed. There is no assurance of compatibility with third-party rolls.

Table 1-2. Compatibility

Requires	Conflicts
Base	
Kernel	
OS	

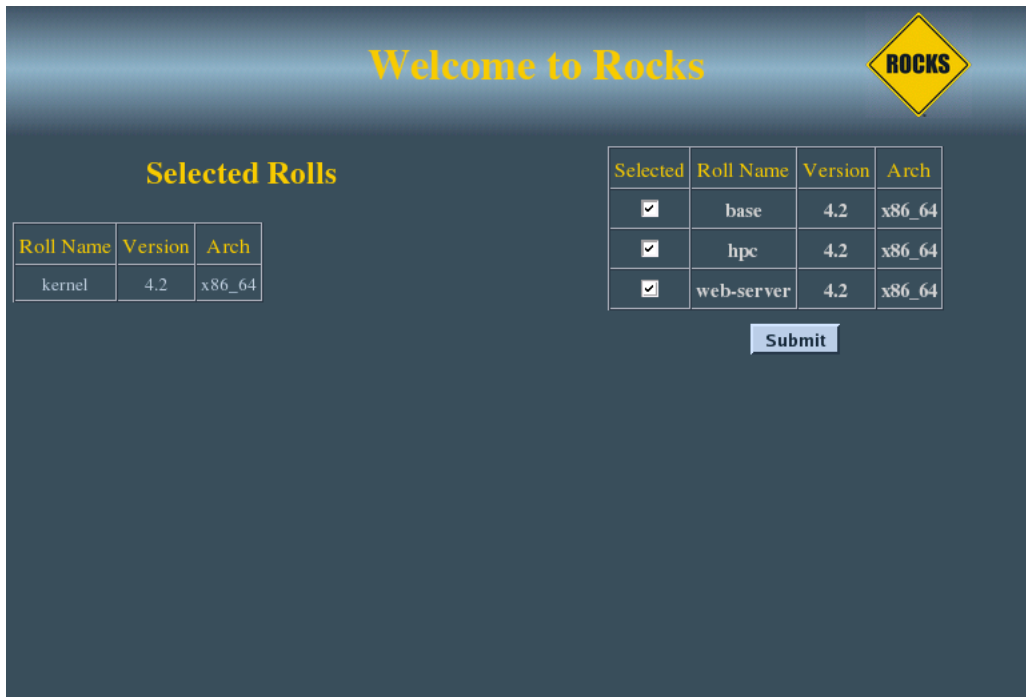


This roll has been released independent of the corresponding Rocks® release. It therefore requires the complete **OS** roll and will not function correctly if using only the **Jumbo** or incomplete set of **OS** CDRoms.

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.



The screenshot shows a dark blue background with the text "Welcome to Rocks" in yellow at the top center. To the right is a yellow diamond-shaped logo with the word "ROCKS" in black. Below the title, the heading "Selected Rolls" is displayed in yellow. There are two tables. The first table, on the left, has three columns: "Roll Name", "Version", and "Arch". It contains one row with the values "kernel", "4.2", and "x86_64". The second table, on the right, has four columns: "Selected", "Roll Name", "Version", and "Arch". It contains three rows, each with a checked checkbox in the "Selected" column. The rows are: "base", "4.2", "x86_64"; "hpc", "4.2", "x86_64"; and "web-server", "4.2", "x86_64". Below the second table is a blue button with the word "Submit" in white.

Roll Name	Version	Arch
kernel	4.2	x86_64

Selected	Roll Name	Version	Arch
<input checked="" type="checkbox"/>	base	4.2	x86_64
<input checked="" type="checkbox"/>	hpc	4.2	x86_64
<input checked="" type="checkbox"/>	web-server	4.2	x86_64

Submit

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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Rocks(r)
www.rocksclusters.org
version 5.4.3 (Viper)

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Distributed Applications Support Team

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B.6. PVM

PVM version 3.4: Parallel Virtual Machine System
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Emory University, Atlanta GA.
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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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1. <http://cvs.rocksclusters.org>