

# Condor Roll: Users Guide



**Condor**  
*High Throughput Compu*

Version 5.1 Edition



**Condor**  
*High Throughput*

**Condor Roll: Users Guide :**

Version 5.1 Edition

Published Dec 2008

Copyright © 2008 University of California

This document is subject to the Rocks License (see Appendix A: Rocks Copyright).

# Table of Contents

<b>Preface</b> .....	<b>v</b>
<b>1. Overview</b> .....	<b>1</b>
<b>2. Installing the Condor Roll</b> .....	<b>3</b>
2.1. Adding the Roll .....	3
2.2. Frontend Boot.....	3
<b>3. Using the Condor Roll</b> .....	<b>4</b>
3.1. Using Condor .....	4
3.2. Testing the Condor Roll .....	4
<b>A. Rocks Copyright</b> .....	<b>7</b>
<b>B. Third Party Copyrights and Licenses</b> .....	<b>9</b>
B.1. Condor .....	9

# List of Tables

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

# Preface

The Rocks Condor Roll uses the latest stable Condor Release to provide High Throughput Computing environment for Rocks clusters. The Rocks Condor Roll builds on the very good work by the Condor team, to seamlessly install the *de facto* standard grid middleware on Rocks Clusters.

Please visit the Condor Project Homepage<sup>1</sup> to learn more about Condor and the software releases.

## Notes

1. <http://www.cs.wisc.edu/condor/>

# Chapter 1. Overview

**Table 1-1. Summary**

Name	condor
Version	5.1
Maintained By	Rocks Group
Architecture	i386, x86_64
Compatible with Rocks™	5.1

**Table 1-2. Roll Compatibility**

<b>Roll</b>	<b>Requires <sup>a</sup></b>	<b>Optional <sup>b</sup></b>	<b>Conflicts</b>
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	

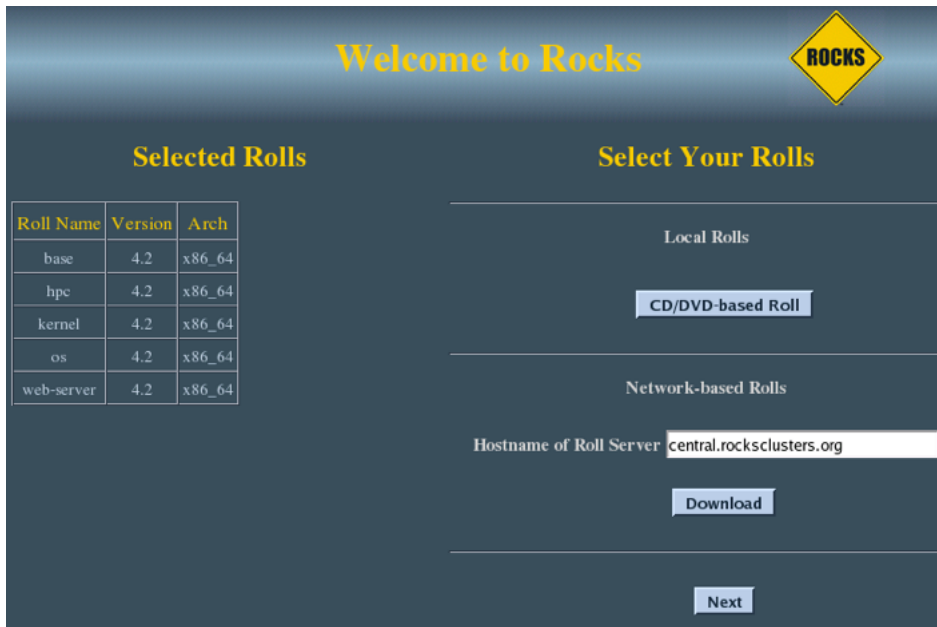
<b>Roll</b>	<b>Requires <sup>a</sup></b>	<b>Optional <sup>b</sup></b>	<b>Conflicts</b>
<p>Notes:</p> <p>a. You may also substitute your own OS CDs for the Rocks™ OS Roll CDs. In this case you must use all the CDs from your distribution and not use any of the Rocks™ OS Roll CDs.</p> <p>b. Only Rolls that 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.</p>			

# Chapter 2. Installing the Condor Roll

## 2.1. Adding the Roll

The Condor Roll must be installed during the Frontend installation step of your cluster (refer to section 1.2 of the Rocks usersguide). Future releases will allow the installation of the Condor Roll onto a running system.

The Condor Roll is added to a Frontend installation in exactly the same manner as the required HPC Roll. Simply select the Condor roll as you would any network- or CD-based roll.



Once the Condor Roll is loaded the installer will continue installation automatically with no further user input. The Frontend will be configured as a condor pool manager and a submit node. The rest of the machines in the cluster will be configured as submit/execute nodes.

## 2.2. Frontend Boot

Near the end of the first startup of the newly installed Frontend node the Condor Roll will complete the installation and configuration of the Condor packages.



# Chapter 3. Using the Condor Roll

## 3.1. Using Condor

This section explains the Condor pool configuration on Rocks clusters, and provides link to further documentation.

Machines in the Condor pool can serve a variety of roles:

- *Central manager* machine is the collector of information, and the negotiator between resources and resource requests. In any Condor pool one machine must be the Central Manager.
- *Submit machine* allows Condor jobs submission.
- *Execute machine* provides resources for Condor jobs execution.

The Frontend is configured as the pool's Central Manager, and the Submit machine. The rest of the nodes are configured as Submit/Execute machines.

The configuration of condor is done during the install, the resulting configuration files are located in `/opt/condor/etc`. To reconfigure condor pool use `/opt/condor/sbin/CondorConf` command, and then restart condor daemons so the new configuration takes an effect. `CondorConf` takes `-h` flag that gives the usage explanation on stdout. Usually, the reconfiguration is only needed when you have multiple network interfaces on your nodes, and the default configuration is not using your desired interface.

By default, on the frontend condor daemons are running on `eth1` interface, and on the compute nodes on `eth0` interface.

Here is an example command for configuring condor as the pool manager and the submit machine on the frontend, assuming the frontend has IP 198.202.89.155:

```
/opt/condor/sbin/CondorConf -n frontend -t sm -m 198.202.89.155
```

The following command will configure compute nodes as Submit/Execute machines:

```
/opt/condor/sbin/CondorConf -n compute -t se -m 198.202.89.155
```

To find information about administrating and using Condor Pools please see the original Condor manual at [Condor manuals](#)<sup>1</sup>

## 3.2. Testing the Condor Roll

1. First, make sure condor daemons are running by executing:

```
# ps -ef | grep condor
```

On the frontend, the output should be similar to following:

```
condor    2623      1  0 Apr19 ?           00:04:26 /opt/condor/sbin/condor_master
condor    2646    2623  0 Apr19 ?           00:20:25 condor_collector -f
```

```
condor    2647  2623  0 Apr19 ?      00:04:56 condor_negotiator -f
condor    2649  2623  0 Apr19 ?      00:00:02 condor_schedd -f
```

And on the compute nodes, the output should be similar to following:

```
condor    17007      1  0 Apr19 ?      00:01:09 /opt/condor/sbin/condor_master
condor    17009 17007  0 Apr19 ?      00:00:02 condor_schedd -f
condor    17010 17007  0 Apr19 ?      00:09:09 condor_startd -f
```

2. Try a test job submission. If you don't already have a non-root user account, you'll need to create one:

```
# useradd testuser
# rocks sync users
```

Then, to run a test job submission, execute:

```
# su - testuser
$ cp /opt/condor/tests/hello.* .
$ condor_submit hello.sub
```

3. Check if jobs are submitted by executing:

```
$ condor_q
```

The output should be similar to:

```
-- Submitter: jeebs.rocksclusters.org : <172.19.119.241:44626> : jeebs.rocksclusters.org
ID      OWNER          SUBMITTED      RUN_TIME ST PRI  SIZE CMD
   2.0  testuser      12/12 09:38   0+00:00:01 R  0   0.0  hello.sh
```

```
1 jobs; 0 idle, 1 running, 0 held
```

*R* in status column(ST) means running. *I* means idling.

4. Once the queue is empty (above command shows no jobs) can see the history of jobs execution with:

```
$ condor_history
```

To see all the nodes in the condor pool do:

```
$ condor_status
```

The output should be similar to:

Name	OpSys	Arch	State	Activity	LoadAv	Mem	ActvtyTime
vm1@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:40:04
vm2@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:45:05
vm3@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:45:06
vm4@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:45:07
vm1@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:35:04
vm2@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:40:05
vm3@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:40:06
vm4@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:40:07
vm1@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:25:04
vm2@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:30:05
vm3@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:30:06
vm4@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:30:07
vm1@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:15:05
vm2@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:20:06
vm3@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:20:07
vm4@compute-0	LINUX	INTEL	Unclaimed	Idle	0.000	506	0+00:20:08

```

vm1@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:10:04
vm2@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:15:05
vm3@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:15:06
vm4@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:15:07
vm1@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:00:04
vm2@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:05:05
vm3@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:05:06
vm4@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:05:07
vm1@compute-0 LINUX          INTEL  Owner      Idle      0.860  506  0+00:00:09
vm2@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:00:05
vm3@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:00:06
vm4@compute-0 LINUX          INTEL  Unclaimed  Idle      0.000  506  0+00:00:07

```

	Machines	Owner	Claimed	Unclaimed	Matched	Preempting
INTEL/LINUX	28	1	0	27	0	0
Total	28	1	0	27	0	0

## Notes

1. <http://www.cs.wisc.edu/condor/manual>

# Appendix A. Rocks Copyright

Rocks(r)  
www.rocksclusters.org  
version 5.1 (VI)

Copyright (c) 2000 - 2008 The Regents of the University of California.  
All rights reserved.

Redistribution and use in source and binary forms, with or without modification, are permitted provided that the following conditions are met:

1. Redistributions of source code must retain the above copyright notice, this list of conditions and the following disclaimer.
2. Redistributions in binary form must reproduce the above copyright notice unmodified and in its entirety, this list of conditions and the following disclaimer in the documentation and/or other materials provided with the distribution.
3. All advertising and press materials, printed or electronic, mentioning features or use of this software must display the following acknowledgement:

"This product includes software developed by the Rocks(r)  
Cluster Group at the San Diego Supercomputer Center at the  
University of California, San Diego and its contributors."

4. Except as permitted for the purposes of acknowledgment in paragraph 3, neither the name or logo of this software nor the names of its authors may be used to endorse or promote products derived from this software without specific prior written permission. The name of the software includes the following terms, and any derivatives thereof: "Rocks", "Rocks Clusters", and "Avalanche Installer". For licensing of the associated name, interested parties should contact Technology Transfer & Intellectual Property Services, University of California, San Diego, 9500 Gilman Drive, Mail Code 0910, La Jolla, CA 92093-0910, Ph: (858) 534-5815, FAX: (858) 534-7345, E-MAIL:invent@ucsd.edu

THIS SOFTWARE IS PROVIDED BY THE REGENTS AND CONTRIBUTORS "AS IS AND ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED. IN NO EVENT SHALL THE REGENTS OR CONTRIBUTORS BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.



# Appendix B. Third Party Copyrights and Licenses

This section enumerates the licenses from all the third party software components of this Roll. A "best effort" attempt has been made to insure the complete and current licenses are listed. In the case of errors or omissions please contact the maintainer of this Roll. For more information on the licenses of any components please consult with the original author(s) or see the Rocks™ CVS repository<sup>1</sup>.

## B.1. Condor

The following is the software license for the version of Condor included in this Roll.

Copyright 1990–2007 Condor Team, Computer Sciences Department,  
University of Wisconsin–Madison, WI.

Apache License  
Version 2.0, January 2004  
<http://www.apache.org/licenses/>

### TERMS AND CONDITIONS FOR USE, REPRODUCTION, AND DISTRIBUTION

#### 1. Definitions.

"License" shall mean the terms and conditions for use, reproduction, and distribution as defined by Sections 1 through 9 of this document.

"Licensor" shall mean the copyright owner or entity authorized by the copyright owner that is granting the License.

"Legal Entity" shall mean the union of the acting entity and all other entities that control, are controlled by, or are under common control with that entity. For the purposes of this definition, "control" means (i) the power, direct or indirect, to cause the direction or management of such entity, whether by contract or otherwise, or (ii) ownership of fifty percent (50%) or more of the outstanding shares, or (iii) beneficial ownership of such entity.

"You" (or "Your") shall mean an individual or Legal Entity exercising permissions granted by this License.

"Source" form shall mean the preferred form for making modifications, including but not limited to software source code, documentation source, and configuration files.

"Object" form shall mean any form resulting from mechanical transformation or translation of a Source form, including but not limited to compiled object code, generated documentation, and conversions to other media types.

## *Appendix B. Third Party Copyrights and Licenses*

"Work" shall mean the work of authorship, whether in Source or Object form, made available under the License, as indicated by a copyright notice that is included in or attached to the work (an example is provided in the Appendix below).

"Derivative Works" shall mean any work, whether in Source or Object form, that is based on (or derived from) the Work and for which the editorial revisions, annotations, elaborations, or other modifications represent, as a whole, an original work of authorship. For the purposes of this License, Derivative Works shall not include works that remain separable from, or merely link (or bind by name) to the interfaces of, the Work and Derivative Works thereof.

"Contribution" shall mean any work of authorship, including the original version of the Work and any modifications or additions to that Work or Derivative Works thereof, that is intentionally submitted to Licensor for inclusion in the Work by the copyright owner or by an individual or Legal Entity authorized to submit on behalf of the copyright owner. For the purposes of this definition, "submitted" means any form of electronic, verbal, or written communication sent to the Licensor or its representatives, including but not limited to communication on electronic mailing lists, source code control systems, and issue tracking systems that are managed by, or on behalf of, the Licensor for the purpose of discussing and improving the Work, but excluding communication that is conspicuously marked or otherwise designated in writing by the copyright owner as "Not a Contribution."

"Contributor" shall mean Licensor and any individual or Legal Entity on behalf of whom a Contribution has been received by Licensor and subsequently incorporated within the Work.

2. Grant of Copyright License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable copyright license to reproduce, prepare Derivative Works of, publicly display, publicly perform, sublicense, and distribute the Work and such Derivative Works in Source or Object form.
3. Grant of Patent License. Subject to the terms and conditions of this License, each Contributor hereby grants to You a perpetual, worldwide, non-exclusive, no-charge, royalty-free, irrevocable (except as stated in this section) patent license to make, have made, use, offer to sell, sell, import, and otherwise transfer the Work, where such license applies only to those patent claims licensable by such Contributor that are necessarily infringed by their Contribution(s) alone or by combination of their Contribution(s) with the Work to which such Contribution(s) was submitted. If You institute patent litigation against any entity (including a cross-claim or counterclaim in a lawsuit) alleging that the Work or a Contribution incorporated within the Work constitutes direct or contributory patent infringement, then any patent licenses granted to You under this License for that Work shall terminate as of the date such litigation is filed.

4. Redistribution. You may reproduce and distribute copies of the Work or Derivative Works thereof in any medium, with or without modifications, and in Source or Object form, provided that You meet the following conditions:
  - (a) You must give any other recipients of the Work or Derivative Works a copy of this License; and
  - (b) You must cause any modified files to carry prominent notices stating that You changed the files; and
  - (c) You must retain, in the Source form of any Derivative Works that You distribute, all copyright, patent, trademark, and attribution notices from the Source form of the Work, excluding those notices that do not pertain to any part of the Derivative Works; and
  - (d) If the Work includes a "NOTICE" text file as part of its distribution, then any Derivative Works that You distribute must include a readable copy of the attribution notices contained within such NOTICE file, excluding those notices that do not pertain to any part of the Derivative Works, in at least one of the following places: within a NOTICE text file distributed as part of the Derivative Works; within the Source form or documentation, if provided along with the Derivative Works; or, within a display generated by the Derivative Works, if and wherever such third-party notices normally appear. The contents of the NOTICE file are for informational purposes only and do not modify the License. You may add Your own attribution notices within Derivative Works that You distribute, alongside or as an addendum to the NOTICE text from the Work, provided that such additional attribution notices cannot be construed as modifying the License.

You may add Your own copyright statement to Your modifications and may provide additional or different license terms and conditions for use, reproduction, or distribution of Your modifications, or for any such Derivative Works as a whole, provided Your use, reproduction, and distribution of the Work otherwise complies with the conditions stated in this License.

5. Submission of Contributions. Unless You explicitly state otherwise, any Contribution intentionally submitted for inclusion in the Work by You to the Licensor shall be under the terms and conditions of this License, without any additional terms or conditions. Notwithstanding the above, nothing herein shall supersede or modify the terms of any separate license agreement you may have executed with Licensor regarding such Contributions.
6. Trademarks. This License does not grant permission to use the trade names, trademarks, service marks, or product names of the Licensor, except as required for reasonable and customary use in describing the



origin of the Work and reproducing the content of the NOTICE file.

7. Disclaimer of Warranty. Unless required by applicable law or agreed to in writing, Licensor provides the Work (and each Contributor provides its Contributions) on an "AS IS" BASIS, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied, including, without limitation, any warranties or conditions of TITLE, NON-INFRINGEMENT, MERCHANTABILITY, or FITNESS FOR A PARTICULAR PURPOSE. You are solely responsible for determining the appropriateness of using or redistributing the Work and assume any risks associated with Your exercise of permissions under this License.
8. Limitation of Liability. In no event and under no legal theory, whether in tort (including negligence), contract, or otherwise, unless required by applicable law (such as deliberate and grossly negligent acts) or agreed to in writing, shall any Contributor be liable to You for damages, including any direct, indirect, special, incidental, or consequential damages of any character arising as a result of this License or out of the use or inability to use the Work (including but not limited to damages for loss of goodwill, work stoppage, computer failure or malfunction, or any and all other commercial damages or losses), even if such Contributor has been advised of the possibility of such damages.
9. Accepting Warranty or Additional Liability. While redistributing the Work or Derivative Works thereof, You may choose to offer, and charge a fee for, acceptance of support, warranty, indemnity, or other liability obligations and/or rights consistent with this License. However, in accepting such obligations, You may act only on Your own behalf and on Your sole responsibility, not on behalf of any other Contributor, and only if You agree to indemnify, defend, and hold each Contributor harmless for any liability incurred by, or claims asserted against, such Contributor by reason of your accepting any such warranty or additional liability.

END OF TERMS AND CONDITIONS

## **Notes**

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