

# Workload Management: How do I Install HTCondor from sources on top of a Bright Cluster

How to Install HTCondor from sources on top of a Bright Cluster

HTCondor can be installed on top of a Bright Cluster as follows:

**Note:** The following instructions have been tested on Bright 7.3 with CentOS 7 as the base OS.

## On the head node

1. Install dependencies:

```
# yum install setools-console policycoreutils-python perl-Date-Manip.noarch
```

2. untar the sources:

```
# tar -xzvf condor-8.4.9-x86_64_RedHat7-stripped.tar.gz
```

3. Add condor user:

```
# cmsh
```

```
% user add condor
```

```
% comit
```

4. Install Condor using condor\_install script (please note that installation should be done using any other user than root using the --owner option):

```
# cd condor-8.4.9-x86_64_RedHat7-stripped/
```

```
# ./condor_install --prefix=/cm/shared/apps/condor/8.4.9 --owner=condor  
--install-dir=/cm/shared/apps/condor/8.4.9
```

```
Installing Condor from /root/condor-8.4.9-x86_64_RedHat7-stripped to  
/cm/shared/apps/condor/8.4.9
```

Condor has been installed into:

```
/cm/shared/apps/condor/8.4.9
```

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Configured condor using these configuration files:

```
global: /cm/shared/apps/condor/8.4.9/etc/condor_config
```

```
local: /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/condor_config.local
```

In order for Condor to work properly you must set your CONDOR\_CONFIG

environment variable to point to your Condor configuration file:

```
/cm/shared/apps/condor/8.4.9/etc/condor_config before running Condor
```

```
commands/daemons.
```

Created scripts which can be sourced by users to setup their

Condor environment variables. These are:

```
sh: /cm/shared/apps/condor/8.4.9/condor.sh
```

```
csh: /cm/shared/apps/condor/8.4.9/condor.csh
```

5. Copy the condor environment variables setup scrips under /etc/profile.d :

```
# cp --preserve /cm/shared/apps/condor/8.4.9/condor.{sh,csh} /etc/profile.d/
```

6. Configure Condor with condor\_config script:

```
# ./condor_config --type=manager,submit --verbose  
--install-dir=/cm/shared/apps/condor/8.4.9
```

Condor will be run as user: condor

Install directory: /cm/shared/apps/condor/8.4.9

Main config file: /cm/shared/apps/condor/8.4.9/etc/condor\_config

Local directory: /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2

Local config file: /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/condor\_config.local

Writing settings to file: /cm/shared/apps/condor/8.4.9/etc/condor\_config

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```
CONDOR_HOST=ma-c-12-30-b73-c7u2.cm.cluster
```

```
COLLECTOR_NAME=
```

```
DAEMON_LIST=COLLECTOR MASTER NEGOTIATOR SCHEDD
```

Configured condor using these configuration files:

```
global: /cm/shared/apps/condor/8.4.9/etc/condor_config
```

```
local: /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/condor_config.local
```

In order for Condor to work properly you must set your CONDOR\_CONFIG

environment variable to point to your Condor configuration file:

```
/cm/shared/apps/condor/8.4.9/etc/condor_config before running Condor
```

```
commands/daemons.
```

Created scripts which can be sourced by users to setup their

Condor environment variables. These are:

```
sh: /cm/shared/apps/condor/8.4.9/condor.sh
```

```
csh: /cm/shared/apps/condor/8.4.9/condor.csh
```

7. modify the condor\_config file to point to the correct paths for different configuration parameters and expand the Condor pool beyond a single host (set ALLOW\_WRITE to match all of the hosts):

```
# cat /cm/shared/apps/condor/8.4.9/etc/condor_config | grep -vE "^#|^$"
RELEASE_DIR = /cm/shared/apps/condor/8.4.9
LOCAL_DIR = /cm/shared/apps/condor/8.4.9/local.$(HOSTNAME)
LOCAL_CONFIG_FILE =
/cm/shared/apps/condor/8.4.9/local.$(HOSTNAME)/condor_config.local
LOCAL_CONFIG_DIR = $(LOCAL_DIR)/config
use SECURITY : HOST_BASED
ALLOW_WRITE = *.cm.cluster
use ROLE : Personal
CONDOR_HOST = master.cm.cluster
UID_DOMAIN = cm.cluster
FILESYSTEM_DOMAIN = cm.cluster
```

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```
LOCK = /tmp/condor-lock.0.0129490057743205
CONDOR_IDS = 1001.1001
CONDOR_ADMIN = root@master.cm.cluster
MAIL = /usr/bin/mail
JAVA = /usr/bin/java
JAVA_MAXHEAP_ARGUMENT = -Xmx1024m
DAEMON_LIST = MASTER COLLECTOR SCHEDD NEGOTIATOR
STARTD_DEBUG = D_FULLDEBUG
COLLECTOR_DEBUG = D_FULLDEBUG
COLLECTOR_HOST = $(CONDOR_HOST):9618
```

## 8. Create startup/boot script for starting Condor services

```
# cp --preserve /cm/shared/apps/condor/8.4.9/etc/examples/condor.service /lib/systemd/system/
```

```
# cat /lib/systemd/system/condor.service
```

[Unit]

Description=Condor Distributed High-Throughput-Computing

After=syslog.target network-online.target nslcd.service ypbind.service

Wants=network-online.target

[Service]

Environment=CONDOR\_CONFIG=/cm/shared/apps/condor/8.4.9/etc/condor\_config

ExecStart=/cm/shared/apps/condor/8.4.9/sbin/condor\_master -f

ExecStop=/cm/shared/apps/condor/8.4.9/sbin/condor\_off -master

ExecReload=/bin/kill -HUP \$MAINPID

Restart=always

RestartSec=1minute

StandardOutput=syslog

LimitNOFILE=16384

# Workload Management: How do I Install HTCondor from sources on top of a Bright Cluster

[Install]

```
WantedBy=multi-user.target
```

```
# systemctl enable condor.service
```

```
Created symlink from /etc/systemd/system/multi-user.target.wants/condor.service to /usr/lib/systemd/system/condor.service.
```

9. Start the Condor service:

```
# systemctl restart condor.service
```

```
# # systemctl status condor.service
```

```
? condor.service - Condor Distributed High-Throughput-Computing
```

```
Loaded: loaded (/usr/lib/systemd/system/condor.service; enabled; vendor preset: disabled)
```

```
Active: active (running) since Fri 2016-12-30 11:24:23 CET; 4s ago
```

```
Main PID: 15093 (condor_master)
```

```
CGroup: /system.slice/condor.service
```

```
??15093 /cm/shared/apps/condor/8.4.9/sbin/condor_master -f
```

```
??15118 condor_procd -A /tmp/condor-lock.0.0129490057743205/procd_pipe -L /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/log/ProcLog -R 1000000 -S 60 -C 1001
```

```
??15119 condor_collector -f
```

```
??15132 condor_negotiator -f
```

```
??15133 condor_schedd -f
```

```
Dec 30 11:24:23 ma-c-12-30-b73-c7u2 systemd[1]: Started Condor Distributed High-Throughput-Computing.
```

```
Dec 30 11:24:23 ma-c-12-30-b73-c7u2 systemd[1]: Starting Condor Distributed High-Throughput-Computing...
```

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```
# ps aux | grep condor
```

```
condor 15093 0.0 0.1 42884 5516 ? Ss 11:24 0:00  
/cm/shared/apps/condor/8.4.9/sbin/condor_master -f
```

```
root 15118 0.0 0.1 23004 4580 ? S 11:24 0:00 condor_procd -A  
/tmp/condor-lock.0.0129490057743205/procd_pipe -L  
/cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/log/ProcLog -R 1000000 -S 60 -C  
1001
```

```
condor 15119 0.0 0.1 64064 6352 ? Ss 11:24 0:00 condor_collector -f
```

```
condor 15132 0.0 0.1 42884 5480 ? Ss 11:24 0:00 condor_negotiator -f
```

```
condor 15133 0.0 0.1 63268 7144 ? Ss 11:24 0:00 condor_schedd -f
```

```
root 15211 0.0 0.0 112648 956 pts/0 S+ 11:25 0:00 grep --color=auto condor
```

In the software image -- assuming default-image is the image currently used by the compute nodes

## 1. Install dependencies:

```
# yum install setools-console polycoreutils-python perl-Date-Manip.noarch  
--installroot=/cm/images/default-image
```

## 2. Install Condor inside the software image

- Create a local configuration directory for each compute node (substitute node001/node002 with the correct node name and repeat/loop for the required number of nodes):

```
# cp -r --preserve /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/  
/cm/shared/apps/condor/8.4.9/local.node001/
```

```
# cp -r --preserve /cm/shared/apps/condor/8.4.9/local.ma-c-12-30-b73-c7u2/  
/cm/shared/apps/condor/8.4.9/local.node002/
```

- Create a startup/boot script for starting Condor services in the software image:

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```
# cat /cm/images/default-image/lib/systemd/system/condor.service
```

```
[Unit]
```

```
Description=Condor Distributed High-Throughput-Computing
```

```
After=syslog.target network-online.target nslcd.service ypbind.service network.target
```

```
Wants=network-online.target network.target
```

```
[Service]
```

```
Environment=CONDOR_CONFIG=/cm/shared/apps/condor/8.4.9/local.%H/condor_config.local
```

```
ExecStart=/cm/shared/apps/condor/8.4.9/sbin/condor_master -f
```

```
ExecStop=/cm/shared/apps/condor/8.4.9/sbin/condor_off -master
```

```
ExecReload=/bin/kill -HUP $MAINPID
```

```
Restart=always
```

```
RestartSec=1 minute
```

```
StandardOutput=syslog
```

```
LimitNOFILE=16384
```

```
[Install]
```

```
WantedBy=multi-user.target
```

- Copy the condor\_config file to condor\_config.local under each local.<node> directory after making the necessary changes for the DAEMON\_LIST

```
# cat /cm/shared/apps/condor/8.4.9/local.node001/condor_config.local | grep -vE "^#|^$"
```

```
RELEASE_DIR = /cm/shared/apps/condor/8.4.9
```

```
LOCAL_DIR = /cm/shared/apps/condor/8.4.9/local.%(HOSTNAME)
```

```
LOCAL_CONFIG_FILE =
```

```
/cm/shared/apps/condor/8.4.9/local.%(HOSTNAME)/condor_config.local
```

```
LOCAL_CONFIG_DIR = $(LOCAL_DIR)/config
```

```
use SECURITY : HOST_BASED
```

```
use ROLE : Personal
```

```
CONDOR_HOST = master
```

```
ALLOW_WRITE = *
```

```
UID_DOMAIN = cm.cluster
```

```
FILESYSTEM_DOMAIN = cm.cluster
```

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```
LOCK = /tmp/condor-lock.0.0129490057743205
```

```
CONDOR_IDS = 1001.1001
```

```
CONDOR_ADMIN = root@master.cm.cluster
```

```
MAIL = /usr/bin/mail
```

```
JAVA = /usr/bin/java
```

```
JAVA_MAXHEAP_ARGUMENT = -Xmx1024m
```

```
COLLECTOR_HOST = $(CONDOR_HOST):9618
```

```
DAEMON_LIST = MASTER STARTD
```

3. reboot the compute nodes to be provisioned using the modified software image

(check status from the head node after the nodes are up)

```
# condor_status
```

Name	OpSys	Arch	State	Activity	LoadAv	Mem	ActvtyTime
node001.cm.cluster	LINUX	X86_64	Unclaimed	Idle	0.000	993	0+00:30:04
node002.cm.cluster	LINUX	X86_64	Unclaimed	Idle	0.150	993	0+00:00:04
Total Owner Claimed Unclaimed Matched Preempting Backfill							
X86_64/LINUX	2	0	0	2	0	0	0
Total	2	0	0	2	0	0	0

```
[root@ma-c-12-30-b73-c7u2 ~]#
```

## Submitting a job

Submitting jobs as root is not allowed so you have to switch to any other user to be able to submit jobs.



# Workload Management: How do I Install HTCondor from sources on top of a Bright Cluster

```
# su - cmsupport
```

```
$ cat hostname.sh
```

```
#!/bin/bash
```

```
hostname -f
```

```
date
```

```
sleep 20
```

```
date
```

```
echo "exit"
```

```
$ cat hostname.condor
```

```
#####
```

```
# Example job file
```

```
#####
```

```
Universe=vanilla
```

```
Executable=/home/cmsupport/hostname.sh
```

```
input=/dev/null
```

```
output=hostname.out
```

```
error=hostname.error
```

```
Queue
```

```
$ condor_submit hostname.condor
```

```
$ condor_q
```

```
-- Schedd: ma-c-12-30-b73-c7u2.cm.cluster : <10.141.255.254:50275?...
```

ID	OWNER	SUBMITTED	RUN_TIME	ST	PRI	SIZE	CMD
9.0	cmsupport	12/30 17:33	0+00:00:06	R	0	0.0	hostname.sh

```
1 jobs; 0 completed, 0 removed, 0 idle, 1 running, 0 held, 0 suspended
```

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```
1 jobs; 0 completed, 0 removed, 0 idle, 1 running, 0 held, 0 suspended
```

```
$ cat hostname.out
```

```
node002.cm.cluster
```

```
Fri Dec 30 17:33:58 CET 2016
```

```
Fri Dec 30 17:34:18 CET 2016
```

```
exit
```

```
$ condor_history
```

ID	OWNER	SUBMITTED	RUN_TIME	ST	COMPLETED	CMD
9.0	cmsupport	12/30 17:33	0+00:00:20	C	12/30 17:34	/home/cmsupport/hostname.sh
6.0	cmsupport	12/30 17:22	0+00:00:00	X	???	/home/cmsupport/hostname.sh
5.0	cmsupport	12/30 16:58	0+00:00:00	X	???	/home/cmsupport/hostname.sh
8.0	cmsupport	12/30 17:33	0+00:00:00	X	???	/home/cmsupport/hostname.sh
7.0	cmsupport	12/30 17:32	0+00:00:00	X	???	/home/cmsupport/hostname.sh
1.0	cmsupport	12/30 16:38	0+00:00:00	X	???	/home/cmsupport/hostname.sh
2.0	cmsupport	12/30 16:40	0+00:00:00	X	???	/home/cmsupport/hostname.sh
4.0	condor	12/30 16:43	0+00:00:00	X	???	/home/condor/hostname.sh

Unique solution ID: #1344

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