volclava 安装及配置文档

Product Name : volclava

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目录

1 安装前准备 3

1.1 操作系统依赖 3
1.2 MASTER 节点资源配置 3

2 安装 VOLCLAVA 集群 3

2.1 获取源码 3
2.2 安装 4
2.2.1 将源码包传入 volclava_master 节点 4
2.2.2 以 root 身份登录到 volclava_master 节点 4
2.2.3 创建 volclava 账号 4
2.2.4 安装系统库和编译库 4
2.2.5 自动安装方式 4
2.2.6 手动安装方式 1：源码安装 5
2.2.7 手动安装方式 2：rpm 安装 8
2.3 VOLCLAVA 安装路径目录结构 11
2.4 配置 VOLCLAVA 集群和计算节点 11
2.5 启动 VOLCLAVA 相关服务 12

3 验证 VOLCLAVA 服务 13

4 配置示例 14

4.1 添加计算节点或客户端节点到 VOLCLAVA 集群 14
4.2 定义计算节点和主机组 15
4.3 定义用户组 16
4.4 新建队列 17

5 集群升级步骤 17

6 常见安装问题 19

6.1 HOST DOES NOT BELONG TO LSF CLUSTER 19
6.2 出现 USER PERMISSION DENIED 的报错，请检查各计算节点的 DNS 正反解析 19

1 安装前准备

1.1 操作系统依赖

volclava project 1.0.0 的开发和测试操作系统为 **CentOS Linux release 7.9.2009 (Core)**，这也是 IC 设计常用的操作系统版本之一。

centos6/centos7/centos8，及对应的 redhat/rocky 版本应该都可以运行，主要的潜在风险在于系统库版本差异可能会影响部分组件的运行。

1.2 master 节点资源配置

volclava_master 节点的资源配置可参照下图

Cluster size	Active jobs	Minimum required memory (typical)	Recommended server CPU (Intel, AMD, OpenPower, or equivalent)
Small (<100 hosts)	1,000	1 GB (32 GB)	Any server CPU
	10,000	2 GB (32 GB)	Recent server CPU
Medium (100 - 1000 hosts)	10,000	4 GB (64 GB)	Multi-core CPU (2 cores)
	50,000	8 GB (64 GB)	Multi-core CPU (4 cores)
Large (>1000 hosts)	50,000	16 GB (128 GB)	Multi-core CPU (4 cores)
	500,000	32 GB (256 GB)	Multi-core CPU (8 cores)

2 安装 volclava 集群

2.1 获取源码

1) volclava project 1.0.0 的 github 路径位于 https://github.com/bytedance/volclava
2) git clone 获取源码

```Shell
user1:~ bytedance$ git clone
https://github.com/bytedance/volclava.git
```

2.2 安装

2.2.1 将源码包传入 volclava_master 节点

2.2.2 以 root 身份登录到 volclava_master 节点

2.2.3 创建 volclava 账号

```
Shell
[root@master-test ~]# useradd -r volclava
```

2.2.4 安装系统库和编译库

```
Shell
#配置好 yum 源之后，安装相关依赖
[root@master-test ~]# yum install -y tcl-devel ncurses-devel
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
Resolving Dependencies
--> Running transaction check
---> Package ncurses-devel.x86_64 0:5.9-14.20130511.el7_4 will be
installed
---> Package tcl-devel.x86_64 1:8.5.13-8.el7 will be installed
....
Installed:
  ncurses-devel.x86_64 0:5.9-14.20130511.el7_4
tcl-devel.x86_64 1:8.5.13-8.el7
Complete!

[root@master-test ~]# yum groupinstall -y "Development Tools"
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
......
Complete!
```

2.2.5 自动安装方式

源码包中提供一个自动安装脚本 volcinstall.centos.sh，使用该脚本可以自动完成 master 节点的安装和环境配置。安装好后，仍然需要手动完成其他计算节点的环境配置。在计算节点上，也可以通过自动化脚本 VOLCLAVA_TOP/etc/openlava.setup 完成环境设置。如下：

```
Plain Text
进入源码包目录：
[root@master-test test]# cd /install_pkg/volclava
[root@master-test volclava]# ./volcinstall.centos.sh -h
Usage: volcinstall.centos.sh [--help] [--type=code|rpm] [--
prefix=/usr/volclava]

运行脚本：
[root@master-test volclava]# ./volcinstall.centos.sh --type=code -
-profix=/software/volclava-1.0
或者
[root@master-test volclava]# ./volcinstall.centos.sh --type=rpm --
profix=/software

下面以从 source code 安装为例：
[root@master-test volclava]# ./volcinstall.centos.sh --type=code -
-profix=/software/volclava-1.0
....
make[1]: Leaving directory `/install_pkg/volclava'
make: warning:  Clock skew detected.  Your build may be
incomplete.
Congratulates, the volclava is installed under /software/volclava-
1.0
You can source environment by: source /software/volclava-
1.0/etc/volclava.sh
Go on to configure master/compute node and enjoy journey!

配置计算节点 cmp1-test，cmp2-test:
[root@cmp1-test ~]# source /software/volclava-1.0/etc/volclava.sh
[root@cmp1-test ~]# sh /software/volclava-1.0/etc/volclava.setup
[root@cmp2-test ~]# source /software/volclava-1.0/etc/volclava.sh
[root@cmp2-test ~]# sh /software/volclava-1.0/etc/volclava.setup
```

2.2.6 手动安装方式 1：源码安装

以下步骤是源码手动安装过程，通过此过程可以更好地了解 volclava 安装步骤。

```
Shell
# 进入源码包目录
[root@master-test test]# cd /install_pkg/volclava
[root@master-test volclava]# ll
```

```
total 88
-rw-r--r--.  1 3081817 1120     0 Nov 27 14:19 AUTHORS
-rw-r--r--.  1 3081817 1120   117 Nov 27 14:19 bootstrap.sh
-rw-r--r--.  1 3081817 1120  4234 Nov 27 14:19 ChangeLog
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 chkpnt
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 config
-rw-r--r--.  1 3081817 1120  2927 Nov 27 14:19 configure.ac
-rw-r--r--.  1 3081817 1120 18122 Nov 27 14:19 COPYING
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 docs
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 eauth
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 examples
-rw-r--r--.  1 3081817 1120     0 Nov 27 14:19 INSTALL
drwxr-xr-x.  9 3081817 1120  4096 Nov 27 14:19 lsbatch
drwxr-xr-x. 10 3081817 1120  4096 Nov 27 14:19 lsf
-rw-r--r--.  1 3081817 1120   162 Nov 27 14:19 Makefile.am
-rw-r--r--.  1 3081817 1120     0 Nov 27 14:19 NEWS
-rw-r--r--.  1 3081817 1120   448 Nov 27 14:19 README
-rw-r--r--.  1 3081817 1120   923 Nov 27 14:19 README_OPENLAVA
-rw-r--r--.  1 3081817 1120  1728 Nov 27 14:19 rpm.sh
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 scripts
drwxr-xr-x.  2 3081817 1120  4096 Nov 27 14:19 spec
-rw-r--r--.  1 3081817 1120    37 Nov 27 14:19 THANKS

#bootstrap.sh 使用--prefix=<install_path> 指定安装路径（默认是
/opt/volclava1.0）
[root@master-test volclava]# chmod 755 bootstrap.sh
[root@master-test volclava]# ./bootstrap.sh --
prefix=/software/volclava-1.0
+ rm -f config.cache
+ aclocal
+ autoconf
...
config.status: creating config.h
config.status: executing depfiles commands

# make
[root@master-test volclava]# make
......
make[2]: Nothing to be done for `all'.
make[2]: Leaving directory `/install_pkg/volclava-1.0/config'
make[2]: Entering directory `/install_pkg/volclava-1.0'
make[2]: Leaving directory `/install_pkg/volclava-1.0'
make[1]: Leaving directory `/install_pkg/volclava-1.0'
```

```
#make install
[root@master-test volclava]# make install
Making install in lsf
make[1]: Entering directory `/install_pkg/volclava-1.0/lsf'
Making install in intlib
......
make[2]: Nothing to be done for `install-exec-am'.
make[2]: Nothing to be done for `install-data-am'.
make[2]: Leaving directory `/install_pkg/volclava-1.0'
make[1]: Leaving directory `/install_pkg/volclava-1.0'


# 安装完成，查看最终安装路径
[root@master-test software]# cd /software/volclava-1.0
[root@master-test volclava-1.0]# ll
total 32
drwxr-xr-x. 2 root root 4096 Nov 27 14:26 bin
drwxr-xr-x. 2 root root 4096 Nov 27 14:26 etc
drwxr-xr-x. 2 root root 4096 Nov 27 14:26 include
drwxr-xr-x. 2 root root 4096 Nov 27 14:26 lib
drwxr-xr-x. 2 root root 4096 Nov 27 14:26 log
drwxr-xr-x. 2 root root 4096 Nov 27 14:26 sbin
drwxr-xr-x. 3 root root 4096 Nov 27 14:26 share
drwxr-xr-x. 3 root root 4096 Nov 27 14:26 work

#请确认 volclava 集群中所有的主机都可以以相同的路径名访问 volclava 的顶层安装目录，为便于管理，建议将软件移动到共享存储路径上

# 修改安装目录权限
[root@master-test software]# chown -R volclava:volclava
/software/volclava-1.0
[root@master-test software]# chmod 755 -R  /software/volclava-1.0

# 以下配置以三节点集群为例（master +cmp1 +cmp2）
# 启机脚本配置
[root@master-test ~]# cp /software/volclava-1.0/etc/volclava
/etc/init.d/
[root@cmp1-test ~]# cp /software/volclava-1.0/etc/volclava
/etc/init.d/
[root@cmp2-test ~]# cp /software/volclava-1.0/etc/volclava
/etc/init.d/

# 配置 volclava 登陆自动设置 shell 环境
[root@master-test ~]# cp  /software/volclava-1.0/etc/volclava.*
```

```
/etc/profile.d/
[root@cmp1-test ~]# cp  /software/volclava-1.0/etc/volclava.*
/etc/profile.d/
[root@cmp2-test ~]# cp  /software/volclava-1.0/etc/volclava.*
/etc/profile.d/

# 配置 volclava 环境变量
[root@master-test ~]# source /software/volclava-
1.0/etc/volclava.sh
[root@cmp1-test ~]# source /software/volclava-1.0/etc/volclava.sh
[root@cmp2-test ~]# source /software/volclava-1.0/etc/volclava.sh

# chkconfig volclava on 检查 volclava 服务配置，以及配置系统启动时自动启动 volclava 服务
[root@master-test ~]# chkconfig --add volclava ; chkconfig
volclava on
[root@cmp1-test ~]# chkconfig --add volclava ; chkconfig volclava
on
[root@cmp2-test ~]# chkconfig --add volclava ; chkconfig volclava
on
```

2.2.7 手动安装方式 2：rpm 安装

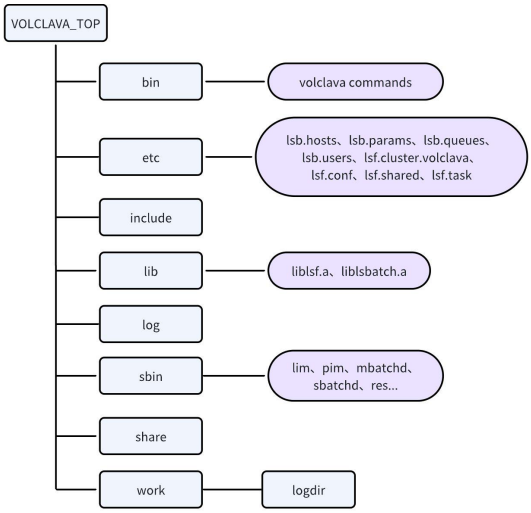
以下步骤是 rpm 手动安装过程，通过此过程可以很好地了解 volclava 安装步骤。

```
Shell
# 配置 rpm 安装需要的相关依赖
[root@master-test test]# yum install -y rpm-build rpmdevtools
Loaded plugins: fastestmirror, langpacks
Loading mirror speeds from cached hostfile
......
Installed:
  rpmdevtools.noarch 0:8.3-8.el7_9
Complete!

# 进入源码包路径
[root@master-test test]# cd /install_pkg/volclava
[root@master-test volclava]# chmod 755 rpm.sh
[root@master-test volclava]# chmod 755 bootstrap.sh

#打包 rpm  默认会生成在 ~/rpmbuild/RPMS/x86_64/
```

```
[root@master-test volclava]# ./rpm.sh
......
Wrote: /root/rpmbuild/SRPMS/volclava-1.0-1.b.20241126.src.rpm
Wrote: /root/rpmbuild/RPMS/x86_64/volclava-1.0-
1.b.20241126.x86_64.rpm
Wrote: /root/rpmbuild/RPMS/x86_64/volclava-debuginfo-1.0-
1.b.20241126.x86_64.rpm
......
+ exit 0
+ '[' 0 '!=' 0 ']'

#打包完成 查看 rpm 包
[root@master-test ~]# ll ~/rpmbuild/RPMS/x86_64/
total 7520
-rw-r--r--. 1 root root 2494304 Nov 27 15:09 volclava-1.0-
1.b.20241126.x86_64.rpm
-rw-r--r--. 1 root root 5203164 Nov 27 15:09 volclava-debuginfo-
1.0-1.b.20241126.x86_64.rpm

#安装 rpm 包 通过--prefix 可执行安装路径（默认是/opt/volclava1.0）
[root@master-test volclava]# cd ~/rpmbuild/RPMS/x86_64/
[root@master-test x86_64]# chmod 755 volclava-1.0-
1.b.20241126.x86_64.rpm
[root@master-test x86_64]# rpm -ivh --prefix /software  volclava-
1.0-1.b.20241126.x86_64.rpm
Preparing...
################################# [100%]
Updating / installing...
   1:volclava-1.0-1.b.20241126
################################# [100%]

# 安装完成，查看最终安装路径
[root@master-test ~]# cd /software/volclava-1.0/
[root@master-test volclava-1.0]# ll
total 28
drwxr-xr-x. 2 volclava volclava  4096 Nov 27 15:12 bin
-rw-r--r--. 1 volclava volclava 18122 Nov 27 15:09 COPYING
drwxr-xr-x. 2 volclava volclava   231 Nov 27 15:12 etc
drwxr-xr-x. 2 volclava volclava    36 Nov 27 15:12 include
drwxr-xr-x. 2 volclava volclava    42 Nov 27 15:12 lib
drwxr-xr-x. 2 volclava volclava     6 Nov 27 15:09 log
-rw-r--r--. 1 volclava volclava   448 Nov 27 15:09 README
drwxr-xr-x. 2 volclava volclava   125 Nov 27 15:12 sbin
drwxr-xr-x. 3 volclava volclava    17 Nov 27 15:12 share
```

```
drwxr-xr-x. 3 volclava volclava    20 Nov 27 15:12 work

# 请确认 volclava 集群中所有的主机都可以以相同的路径名访问 volclava 的顶层安装目录，为便于管理，建议将软件移动到共享存储路径上

# 配置 volclava 环境变量,以三节点集群为例（master +cmp1 +cmp2）。rpm 包已经为 master 节点配置好环境，需要配置计算节点
[root@cmp1-test ~]# cp /software/volclava-1.0/etc/volclava
/etc/init.d/
[root@cmp2-test ~]# cp /software/volclava-1.0/etc/volclava
/etc/init.d/

# 配置 volclava 登陆自动设置 shell 环境
[root@cmp1-test ~]# cp  /software/volclava-1.0/etc/volclava.*
/etc/profile.d/
[root@cmp2-test ~]# cp  /software/volclava-1.0/etc/volclava.*
/etc/profile.d/

# chkconfig volclava on 检查 volclava 服务配置，以及配置系统启动时自动启动 volclava 服务
[root@cmp1-test ~]# chkconfig --add volclava ; chkconfig volclava
on
[root@cmp2-test ~]# chkconfig --add volclava ; chkconfig volclava
on

# 配置 master 和计算节点 volclava 环境变量
[root@master-test ~]# source /software/volclava-
1.0/etc/volclava.sh
[root@cmp1-test ~]# source /software/volclava-1.0/etc/volclava.sh
[root@cmp2-test ~]# source /software/volclava-1.0/etc/volclava.sh
```

2.3 volclava 安装路径目录结构



2.4 配置 volclava 集群和计算节点

1）关闭集群内节点的防火墙

```
Shell
[root@master-test ~]# systemctl stop firewalld
[root@master-test ~]# systemctl disable firewalld
#cmp1、cmp2 等其余计算节点同理
```

2）若仅采用/etc/hosts 文件作为 DNS 解析来源，需要在各个机器的/etc/hosts 里面添加集群内机器的 ip 和 hostname 映射关系

```
Shell
[root@master-test ~]# cat /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost4
localhost4.localdomain4
::1         localhost localhost.localdomain localhost6
localhost6.localdomain6
192.168.1.1 master-test
192.168.1.2 cmp1-test
192.168.1.3 cmp2-test
```

3）编辑 lsf.cluster.volclava 文件，添加主机，保存并退出

```
Shell
[root@master-test-test etc]# vim /software/volclava-
```

```
1.0/etc/lsf.cluster.volclava
```

```
Begin   ClusterAdmins
Administrators = volclava
End    ClusterAdmins

Begin   Host
HOSTNAME          model          type  server  r1m  RESOURCES
master-test    IntelI5      linux   1      3.5    (cs)
cmp1-test      IntelI5      linux   1      3.5    (cs)
cmp2-test       IntelI5      linux   1      3.5    (cs)
# yourhost                  IntelI5      linux   1      3.5    (cs)
End     Host

Begin ResourceMap
RESOURCENAME  LOCATION
# tmp2          [default]
# nio           [all]
# console       [default]
End ResourceMap
```

2.5 启动 volclava 相关服务

1) service volclava restart 启动 volclava 服务

```
Shell
[root@master-test ~]# yum install psmisc
[root@master-test ~]# service volclava restart
[root@cmp1-test ~]# yum install psmisc
[root@cmp1-test ~]# service volclava restart
[root@cmp2-test ~]# yum install psmisc
[root@cmp2-test ~]# service volclava restart
```

```
[root@master-test etc]# service volclava restart
Stopping daemons...
Starting daemons...
lim started
res started
sbatchd started
```

2) ps -ef 检验各服务是否正常启动(lim 、 res 、 sbatchd 、 pim 、 mbatchd)

```
[root@master-test etc]# ps -ef | grep volclava
root     31304     1  0 15:19 ?        00:00:00 /software/volclava-1.0/sbin/lim
root     31307     1  0 15:19 ?        00:00:00 /software/volclava-1.0/sbin/res
root     31309     1  0 15:19 ?        00:00:00 /software/volclava-1.0/sbin/sbatchd
root     31310 31304  0 15:19 ?        00:00:00 /software/volclava-1.0/sbin/pim
root     31321 31309  0 15:19 ?        00:00:00 /software/volclava-1.0/sbin/mbatchd -d /software/volclava-1.0/etc
```

3) **单独启动某进程可参考以下命令：**

lsadmin limstartup　　启动 LIM 守护进程

```
[root@master-test ~]# lsadmin limstartup
Starting up LIM on <master-test> ..... done
```

lsadmin resstartup　　启动 RES 守护进程

```
[root@master-test ~]# lsadmin resstartup
Starting up RES on <master-test> ..... done
```

badmin hstartup　　启动 sbatchd 守护进程

```
[root@master-test ~]# badmin hstartup
Starting up slave batch daemon on <master-test> ..... done
```

若有报错请参照最后文档最后一章进行修复

3 验证 volclava 服务

以下操作可以帮助验证 volclava 服务：

```
Shell
[root@master-test ~]# service volclava status ##验证服务状态
lim pid: <5922>
res pid: <5924>
sbatchd pid: <5927>
lim mbatchd: <5940>

[root@master-test ~]# lsid  ##验证集群状态
volclava project 1.0.0, Nov 14 2024

My cluster name is volclava
My master name is master-test

[root@cmp2-test etc]# lshosts  ##查看静态资源
HOST_NAME      type    model  cpuf ncpus maxmem maxswp server
RESOURCES
master-test   linux  IntelI5 100.0     4 32012M 10239M    Yes (cs)
cmp1-test     linux  IntelI5 100.0     4 31993M 10239M    Yes (cs)
cmp2-test     linux  IntelI5 100.0     4 31993M 10239M    Yes (cs)

[root@cmp2-test etc]# lsload  ##查看动态资源
HOST_NAME       status  r15s   r1m  r15m   ut    pg  ls    it
tmp   swp   mem
master-test         ok   0.0   0.0   0.1   0%   0.0   1     0
3321M   10G   28G
cmp1-test           ok   0.0   0.0   0.0   0%   0.0   1     6
20G   10G   29G
```

```
cmp2-test           ok    0.0   0.0   0.0   0%   0.0   1    24
45G   10G   30G

[root@cmp2-test etc]# bhosts  ##查看主机作业负载
HOST_NAME          STATUS       JL/U    MAX  NJOBS    RUN  SSUSP
USUSP    RSV
cmp1-test          ok              -      4      0      0      0
0      0
cmp2-test          ok              -      4      0      0      0
0      0
master-test        ok              -      4      0      0      0
0      0
```

提交 job 验证

```
Shell
[root@master-test ~]# su - volclava
[volclava@master-test ~]$ bsub sleep 100
Job <1> is submitted to default queue <normal>.
[volclava@master-test ~]$ bjobs
JOBID   USER    STAT  QUEUE      FROM_HOST   EXEC_HOST   JOB_NAME
SUBMIT_TIME
1       volclav PEND  normal     master-test             sleep 100
Nov 27 15:03
```

4 配置示例

4.1 添加计算节点或客户端节点到 volclava 集群

以 volclava 账号登录 volclava-master， 编辑 lsf.cluster.volclava，添加主机

```
Shell
vim /software/volclava-1.0/etc/lsf.cluster.volclava
通过将“Server“域置为“1”来 设定服务节点
通过将“Server“域置为“0”来 设定客户节点
volclava 通过该配置文件中机器的顺序来确定 master 节点，以下图为例，
master-test 则为 master 节点
```

```
Begin   ClusterAdmins
Administrators = volclava
End    ClusterAdmins

Begin   Host
HOSTNAME          model          type  server  r1m  RESOURCES
master-test    IntelI5      linux   1      3.5    (cs)
cmp1-test      IntelI5      linux   1      3.5    (cs)
cmp2-test       IntelI5      linux   0      3.5    (cs)
# yourhost                  IntelI5      linux   1      3.5    (cs)
End     Host

Begin ResourceMap
RESOURCENAME  LOCATION
# tmp2          [default]
# nio           [all]
# console       [default]
End ResourceMap
```

保存退出后，运行如下命令以激活 volclava 配置变更

lsadmin reconfig

等待两三分钟后，lsid 正常后再运行以下命令

badmin mbdrestart

使用 **lshosts** 命令 验证配置文件是否生效

```
[root@master-test etc]# lshosts
HOST_NAME      type    model  cpuf ncpus maxmem maxswp server RESOURCES
master-test   linux  IntelI5 100.0     4 32012M 10239M    Yes (cs)
cmp1-test     linux  IntelI5 100.0     4 31993M 10239M    Yes (cs)
cmp2-test     linux  IntelI5 100.0     -      -      -     No (cs)
```

4.2 定义计算节点和主机组

以 volclava 账号登录 volclava-master ， 编辑 lsb.hosts，添加主机和主机组

```
Shell
 vim /software/volclava-1.0/etc/lsb.hosts
```

```
Begin Host
HOST_NAME     MXJ   JL/U    r1m     pg     ls    tmp  DISPATCH_WINDOW  # Keywords
ic-cmp01      !     ()      ()      ()     ()    ()                (Y)  # Example
ic-cmp02      !     ()      ()      ()     ()    ()                (Y)
ic-cmp03      !     ()      ()      ()     ()    ()                (Y)  # Example
ic-cmp04      !     ()      ()      ()     ()    ()                (Y)
default       !    ()      ()     ()     ()     ()     ()               # Example
End Host

# Host groups can be referenced by the queue file.  Each line defines a host
# group.  The first line contains key words; each subsequent line contains a
# group name, followed by white space, followed by the list of group members.
# The list of members should be enclosed in parentheses and separated by white
# space.  This section is optional.

# This example is commented out
Begin HostGroup
GROUP_NAME    GROUP_MEMBER      # Key words
#group0        (host0 host1)    # Define a host group
cmp134        (ic-cmp01 ic-cmp03 ic-cmp04)
End HostGroup

Begin HostGroup
GROUP_NAME    GROUP_MEMBER      # Key words
#group0        (host0 host1)    # Define a host group
cmp02         (ic-cmp02)
End HostGroup
```

计算节点

计算节点组成的主机组

保存退出后，运行如下命令以激活 volclava 配置变更

lsadmin reconfig

等待两三分钟后，lsid 正常后再运行以下命令

badmin mbdrestart

使用 **bmgroup** 命令验证主机组是否生效

```
[root@ic-cmp04 etc]# bmgroup
GROUP_NAME    HOSTS
cmp134        ic-cmp01 ic-cmp03 ic-cmp04
cmp02         ic-cmp02
```

4.3 定义用户组

以 volclava 账号登录 volclava-master ， 编辑 lsb.users，添加用户组

```
Shell
 vim /software/volclava-1.0/etc/lsb.users
```

```
Begin UserGroup
GROUP_NAME        GROUP_MEMBER
develop           (jwang long david ming)
system            (all)
eng_users         (develop zhang ahmedk pangj)
End UserGroup
```

保存退出后，运行如下命令以激活 volclava 配置变更

lsadmin reconfig

等待两三分钟后，lsid 正常后再运行以下命令

badmin mbdrestart

使用 **bugroup** 命令验证用户组是否生效

4.4 新建队列

以 volclava 账号登录 volclava-master ， 编辑 lsb.queues，添加用户组

```
Shell
 vim /software/volclava-1.0/etc/lsb.queues
```

```
Begin Queue
QUEUE_NAME   = interactive
PRIORITY     = 30
USERS        = IT_CAD develop     # users who can submit jobs to this queue
#RUNLIMIT     = 2:00     #2 hours
INTERACTIVE  = YES
HOSTS        = cmp02 cmp134    # hosts on which jobs in this queue can run
#RESOURCE_RESERVE = MAX_RESERVE_TIME[20]
DESCRIPTION  = For interactive job
End Queue
```

保存退出后，运行如下命令以激活 volclava 配置变更

lsadmin reconfig

等待两三分钟后，lsid 正常后再运行以下命令

badmin mbdrestart

使用 bqueues -l interactive 查看队列详细配置

```
[root@ic-cmp04 etc]# bqueues -l interactive

QUEUE: interactive
  -- For interactive job

PARAMETERS/STATISTICS
PRIO NICE STATUS          MAX JL/U JL/P JL/H NJOBS  PEND   RUN SSUSP USUSP  RSV
 30    0  Open:Active       -    -    -    -     0     0     0     0     0    0
Interval for a host to accept two jobs is 0 seconds

SCHEDULING PARAMETERS
           r15s   r1m  r15m   ut      pg    io   ls    it    tmp    swp    mem
 loadSched   -     -     -     -       -     -    -     -     -      -      -
 loadStop    -     -     -     -       -     -    -     -     -      -      -

USERS: IT_CAD/ develop/
HOSTS:  cmp02/ cmp134/
```

5 集群升级步骤

集群升级操作如下：

```
Shell
# 获取最新源码
```

```
https://github.com/bytedance/volclava.git

#编译源码
参照第二章节安装步骤中源码安装或者 rpm 安装
请安装到单独的路径，避免覆盖当前正在使用的安装路径

# 此次调整涉及 deamon 进程，需要提前关停服务
在 master 节点上执行如下命令：
[root@master-test ～]#/software/volclava-1.0/etc/volclava stop
Stopping daemons...
在计算节点上执行如下命令：仅停止 sbatchd
[root@cmp1-test ～] badmin hshutdown
Shut down slave batch daemon on <cmp1-test> ...... done
[root@cmp2-test ～] badmin hshutdown
Shut down slave batch daemon on <cmp2-test> ...... done

# 备份即将进行替换的二进制文件
cp /software/volclava-1.0/bin/bsub /software/volclava-
1.0/bin/bsub_bak
cp /software/volclava-1.0/bin/bhist /software/volclava-
1.0/bin/bhist_bak
cp /software/volclava-1.0/bin/bjobs /software/volclava-
1.0/bin/bjobs_bak
cp /software/volclava-1.0/sbin/mbatchd /software/volclava-
1.0/sbin/mbatchd_bak
cp /software/volclava-1.0/sbin/sbatchd /software/volclava-
1.0/sbin/sbatchd_bak

# 替换更新的二进制文件
/bin/cp ./software/volclava-new/bin/bsub /software/volclava-
1.0/bin/bsub
/bin/cp ./software/volclava-new/bin/bhist /software/volclava-
1.0/bin/bhist
/bin/cp ./software/volclava-new/bin/bjobs /software/volclava-
1.0/bin/bjobs
/bin/cp ./software/volclava-new/sbin/mbatchd /software/volclava-
1.0/sbin/mbatchd
/bin/cp ./software/volclava-new/sbin/sbatchd /software/volclava-
1.0/sbin/sbatchd

# 重启相关服务
在 master 节点上执行：
[root@master-test ～]#/software/volclava-1.0/etc/volclava start
```

```
Starting daemons...
lim started
res started
sbatchd started
在 计算节点 上执行如下命令：重启 sbatchd 服务
[root@cmp1-test ~]# badmin hstartup
Starting up slave batch daemon on <cmp1-test> ...... done
[root@cmp2-test ~]# badmin hstartup
Starting up slave batch daemon on <cmp2-test> ...... done
```

6 常见安装问题

6.1 Host does not belong to LSF cluster

如遇以下报错需先在 lsb.hosts 文件中定义当前主机

```
[root@localhost bin]# lsadmin limstartup
Host does not belong to LSF cluster.
```

```
SQL
vim /software-1.0/volclava/etc/lsb.hosts
增加以下内容
cmp1-test     !    ()     ()     ()     ()     ()     ()
保存文件退出
badmin reconfig
```

```
Begin Host
HOST_NAME     MXJ JL/U    r1m     pg     ls      tmp  DISPATCH_WINDOW  # Keywords
cmp1-test     !   ()      ()     ()     ()      ()      ()
#host0        1    1    3.5/4.5  15/    12/15  0       ()               # Example
#host1       ()   2     3.5   15/18   12/     0/   (5:19:00-1:8:30 20:00-8:30)
#host2        ()   ()   3.5/5    18     15      ()      ()              # Example
default       !   ()      ()     ()     ()      ()      ()              # Example
End Host
```

6.2 出现 User permission denied 的报错，请检查各计算节点的 DNS 正反解析

在主机上启动 volclava 服务进程时，进程会向 volclava 主管理节点发送数据申请加入 volclava 集群。

volclava 主管理节点上的服务进程接收到主机发送来的数据时，首先要对对方的合法性进行判别。判别的项目之一就是根据对方的 IP 地址解析主机名称，然后再根据解析出的主机名称解析出对方的 IP 地址，如果 IP 地址一致并且在合法主机列表中则接收对方的数据，否则会拒绝

对方。

主机名称解析是通过 DNS 实现，但 DNS 中有主机的正向解析记录，没有反向解析记录，而且在主管理节点上的 /etc/hosts 文件中也没有主机 IP 地址和主机名称的记录，因此主管理节点认为主机为非法主机，不允许加入 volclava 集群，从而导致在主机上运行相关命令报错