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MARIADB GALERA CLUSTER
Install & Configure (Confidential)

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Table of Contents

Install & Configure MariaDB Galera Cluster on OEL7.9

1   Configure /etc/hosts on All Nodes (IaaS on Oracle Cloud Infrastructure)

```
10.77.0.195    mariagalera01.sub02051503110.vcnesd2.oraclevcn.com    mariagalera01
10.77.0.143    mariagalera02.sub02051503110.vcnesd2.oraclevcn.com    mariagalera02
10.77.0.67     mariagalera03.sub02051503110.vcnesd2.oraclevcn.com    mariagalera03
```

2   Configure Repository for MariaDB on All Nodes

Link: https://mariadb.org/download/?t=repo-config&d=CentOS+7+%28x86_64%29&v=10.7&r_m=nus

```
[root@mariagalera01 ~]# vi /etc/yum.repos.d/MariaDB.repo; cat /etc/yum.repos.d/MariaDB.repo;
# MariaDB 10.7 CentOS repository list - created 2022-06-01 14:10 UTC
# https://mariadb.org/download/
[mariadb]
name = MariaDB
baseurl = https://download.nus.edu.sg/mirror/mariadb/yum/10.7/centos7-amd64
gpgkey=https://download.nus.edu.sg/mirror/mariadb/yum/RPM-GPG-KEY-MariaDB
gpgcheck=1
[root@mariagalera01 ~]# yum clean all
Loaded plugins: langpacks, ulninfo
Cleaning repos: mariadb ol7_MySQL80 ol7_MySQL80_connectors_community ol7_MySQL80_tools_community ol7_UEKR6
            : ol7_addons ol7_ksplice ol7_latest ol7_oci_included ol7_optional_latest
ol7_software_collections
[root@mariagalera01 ~]#
```

3   Install MariaDB on All Nodes

```
[root@mariagalera01 ~]# yum install -y mariadb-server mariadb-client mariadb-common galera rsync lsof
Loaded plugins: langpacks, ulninfo
Package mariadb-server is obsoleted by MariaDB-server, trying to install MariaDB-server-10.7.4-
1.el7.centos.x86_64 instead
No package mariadb-client available.
  * Maybe you meant: MariaDB-client
No package mariadb-common available.
  * Maybe you meant: MariaDB-common
No package galera available.
Package rsync-3.1.2-10.el7.x86_64 already installed and latest version
Package lsof-4.87-6.el7.x86_64 already installed and latest version
Resolving Dependencies
--> Running transaction check
---> Package MariaDB-server.x86_64 0:10.7.4-1.el7.centos will be installed
--> Processing Dependency: MariaDB-common >= 10.6.1 for package: MariaDB-server-10.7.4-1.el7.centos.x86_64
--> Processing Dependency: MariaDB-client >= 10.6.1 for package: MariaDB-server-10.7.4-1.el7.centos.x86_64
--> Processing Dependency: libpmem.so.1(LIBPMEM_1.0)(64bit) for package: MariaDB-server-10.7.4-
1.el7.centos.x86_64
--> Processing Dependency: galera-4 for package: MariaDB-server-10.7.4-1.el7.centos.x86_64
--> Processing Dependency: libpmem.so.1()(64bit) for package: MariaDB-server-10.7.4-1.el7.centos.x86_64
--> Processing Dependency: libpcre2-8.so.0()(64bit) for package: MariaDB-server-10.7.4-1.el7.centos.x86_64
--> Running transaction check
---> Package MariaDB-client.x86_64 0:10.7.4-1.el7.centos will be installed
--> Processing Dependency: perl(DBI) for package: MariaDB-client-10.7.4-1.el7.centos.x86_64
--> Processing Dependency: perl(Data::Dumper) for package: MariaDB-client-10.7.4-1.el7.centos.x86_64
---> Package MariaDB-common.x86_64 0:10.7.4-1.el7.centos will be installed
--> Processing Dependency: MariaDB-compat for package: MariaDB-common-10.7.4-1.el7.centos.x86_64
---> Package galera-4.x86_64 0:26.4.11-1.el7.centos will be installed
--> Processing Dependency: socat for package: galera-4-26.4.11-1.el7.centos.x86_64
--> Processing Dependency: libboost_program_options-mt.so.1.53.0()(64bit) for package: galera-4-26.4.11-
1.el7.centos.x86_64
---> Package libpmem.x86_64 0:1.5.1-2.1.0.1.el7 will be installed
```

```
---> Package pcre2.x86_64 0:10.23-2.el7 will be installed
--> Running transaction check
---> Package MariaDB-compat.x86_64 0:10.7.4-1.el7.centos will be installed
---> Package boost-program-options.x86_64 0:1.53.0-28.el7 will be installed
---> Package perl-DBI.x86_64 0:1.627-4.el7 will be installed
--> Processing Dependency: perl(RPC::PlClient) >= 0.2000 for package: perl-DBI-1.627-4.el7.x86_64
--> Processing Dependency: perl(RPC::PlServer) >= 0.2001 for package: perl-DBI-1.627-4.el7.x86_64
---> Package perl-Data-Dumper.x86_64 0:2.145-3.el7 will be installed
---> Package socat.x86_64 0:1.7.3.2-2.el7 will be installed
--> Running transaction check
---> Package perl-PlRPC.noarch 0:0.2020-14.el7 will be installed
--> Processing Dependency: perl(Net::Daemon) >= 0.13 for package: perl-PlRPC-0.2020-14.el7.noarch
--> Processing Dependency: perl(Compress::Zlib) for package: perl-PlRPC-0.2020-14.el7.noarch
--> Processing Dependency: perl(Net::Daemon::Log) for package: perl-PlRPC-0.2020-14.el7.noarch
--> Processing Dependency: perl(Net::Daemon::Test) for package: perl-PlRPC-0.2020-14.el7.noarch
--> Running transaction check
---> Package perl-IO-Compress.noarch 0:2.061-2.el7 will be installed
--> Processing Dependency: perl(Compress::Raw::Bzip2) >= 2.061 for package: perl-IO-Compress-2.061-
2.el7.noarch
--> Processing Dependency: perl(Compress::Raw::Zlib) >= 2.061 for package: perl-IO-Compress-2.061-
2.el7.noarch
---> Package perl-Net-Daemon.noarch 0:0.48-5.el7 will be installed
--> Running transaction check
---> Package perl-Compress-Raw-Bzip2.x86_64 0:2.061-3.el7 will be installed
---> Package perl-Compress-Raw-Zlib.x86_64 1:2.061-4.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

==============================================================================================================
=====
 Package                          Arch           Version                        Repository
Size
==============================================================================================================
=====
Installing:
 MariaDB-server                   x86_64         10.7.4-1.el7.centos            mariadb
25 M
Installing for dependencies:
 MariaDB-client                   x86_64         10.7.4-1.el7.centos            mariadb
15 M
 MariaDB-common                   x86_64         10.7.4-1.el7.centos            mariadb
81 k
 MariaDB-compat                   x86_64         10.7.4-1.el7.centos            mariadb
2.2 M
 boost-program-options            x86_64         1.53.0-28.el7                  ol7_latest
156 k
 galera-4                         x86_64         26.4.11-1.el7.centos           mariadb
9.9 M
 libpmem                          x86_64         1.5.1-2.1.0.1.el7              ol7_latest
58 k
 pcre2                            x86_64         10.23-2.el7                    ol7_latest
201 k
 perl-Compress-Raw-Bzip2          x86_64         2.061-3.el7                    ol7_latest
32 k
 perl-Compress-Raw-Zlib           x86_64         1:2.061-4.el7                  ol7_latest
57 k
 perl-DBI                         x86_64         1.627-4.el7                    ol7_latest
801 k
 perl-Data-Dumper                 x86_64         2.145-3.el7                    ol7_latest
47 k
 perl-IO-Compress                 noarch         2.061-2.el7                    ol7_latest
259 k
 perl-Net-Daemon                  noarch         0.48-5.el7                     ol7_latest
50 k
 perl-PlRPC                       noarch         0.2020-14.el7                  ol7_latest
35 k
 socat                            x86_64         1.7.3.2-2.el7                  ol7_latest
289 k

Transaction Summary
```

```
================================================================================
=====
Install  1 Package (+15 Dependent packages)

Total download size: 54 M
Installed size: 228 M
Downloading packages:
warning: /var/cache/yum/x86_64/7Server/mariadb/packages/MariaDB-common-10.7.4-1.el7.centos.x86_64.rpm:
Header V4 DSA/SHA1 Signature, key ID 1bb943db: NOKEY
Public key for MariaDB-common-10.7.4-1.el7.centos.x86_64.rpm is not installed
(1/16): MariaDB-common-10.7.4-1.el7.centos.x86_64.rpm                          |  81 kB  00:00:00
(2/16): MariaDB-compat-10.7.4-1.el7.centos.x86_64.rpm                          | 2.2 MB  00:00:00
(3/16): boost-program-options-1.53.0-28.el7.x86_64.rpm                         | 156 kB  00:00:00
(4/16): MariaDB-client-10.7.4-1.el7.centos.x86_64.rpm                          |  15 MB  00:00:01
(5/16): libpmem-1.5.1-2.1.0.1.el7.x86_64.rpm                                   |  58 kB  00:00:00
(6/16): perl-Compress-Raw-Bzip2-2.061-3.el7.x86_64.rpm                         |  32 kB  00:00:00
(7/16): pcre2-10.23-2.el7.x86_64.rpm                                           | 201 kB  00:00:00
(8/16): perl-Compress-Raw-Zlib-2.061-4.el7.x86_64.rpm                          |  57 kB  00:00:00
(9/16): perl-DBI-1.627-4.el7.x86_64.rpm                                        | 801 kB  00:00:00
(10/16): perl-IO-Compress-2.061-2.el7.noarch.rpm                               | 259 kB  00:00:00
(11/16): perl-Net-Daemon-0.48-5.el7.noarch.rpm                                 |  50 kB  00:00:00
(12/16): perl-Data-Dumper-2.145-3.el7.x86_64.rpm                               |  47 kB  00:00:00
(13/16): socat-1.7.3.2-2.el7.x86_64.rpm                                        | 289 kB  00:00:00
(14/16): perl-PlRPC-0.2020-14.el7.noarch.rpm                                   |  35 kB  00:00:00
(15/16): MariaDB-server-10.7.4-1.el7.centos.x86_64.rpm                         |  25 MB  00:00:11
(16/16): galera-4-26.4.11-1.el7.centos.x86_64.rpm                              | 9.9 MB  00:00:11
--------------------------------------------------------------------------------
-----
Total                                                            4.0 MB/s |  54 MB  00:00:13
Retrieving key from https://download.nus.edu.sg/mirror/mariadb/yum/RPM-GPG-KEY-MariaDB
Importing GPG key 0x1BB943DB:
 Userid     : "MariaDB Package Signing Key <package-signing-key@mariadb.org>"
 Fingerprint: 1993 69e5 404b d5fc 7d2f e43b cbcb 082a 1bb9 43db
 From       : https://download.nus.edu.sg/mirror/mariadb/yum/RPM-GPG-KEY-MariaDB
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : MariaDB-compat-10.7.4-1.el7.centos.x86_64
1/16
  Installing : MariaDB-common-10.7.4-1.el7.centos.x86_64
2/16
  Installing : libpmem-1.5.1-2.1.0.1.el7.x86_64
3/16
  Installing : perl-Data-Dumper-2.145-3.el7.x86_64
4/16
  Installing : pcre2-10.23-2.el7.x86_64
5/16
  Installing : socat-1.7.3.2-2.el7.x86_64
6/16
  Installing : perl-Net-Daemon-0.48-5.el7.noarch
7/16
  Installing : 1:perl-Compress-Raw-Zlib-2.061-4.el7.x86_64
8/16
  Installing : boost-program-options-1.53.0-28.el7.x86_64
9/16
  Installing : galera-4-26.4.11-1.el7.centos.x86_64
10/16
  Installing : perl-Compress-Raw-Bzip2-2.061-3.el7.x86_64
11/16
  Installing : perl-IO-Compress-2.061-2.el7.noarch
12/16
  Installing : perl-PlRPC-0.2020-14.el7.noarch
13/16
  Installing : perl-DBI-1.627-4.el7.x86_64
14/16
  Installing : MariaDB-client-10.7.4-1.el7.centos.x86_64
15/16
  Installing : MariaDB-server-10.7.4-1.el7.centos.x86_64
16/16
```

```
Two all-privilege accounts were created.
One is root@localhost, it has no password, but you need to
be system 'root' user to connect. Use, for example, sudo mysql
The second is mysql@localhost, it has no password either, but
you need to be the system 'mysql' user to connect.
After connecting you can set the password, if you would need to be
able to connect as any of these users with a password and without sudo

See the MariaDB Knowledgebase at https://mariadb.com/kb

Please report any problems at https://mariadb.org/jira

The latest information about MariaDB is available at https://mariadb.org/.

Consider joining MariaDB's strong and vibrant community:
https://mariadb.org/get-involved/

  Verifying  : pcre2-10.23-2.el7.x86_64
1/16
  Verifying  : perl-Compress-Raw-Bzip2-2.061-3.el7.x86_64
2/16
  Verifying  : MariaDB-server-10.7.4-1.el7.centos.x86_64
3/16
  Verifying  : MariaDB-common-10.7.4-1.el7.centos.x86_64
4/16
  Verifying  : galera-4-26.4.11-1.el7.centos.x86_64
5/16
  Verifying  : boost-program-options-1.53.0-28.el7.x86_64
6/16
  Verifying  : perl-IO-Compress-2.061-2.el7.noarch
7/16
  Verifying  : perl-Data-Dumper-2.145-3.el7.x86_64
8/16
  Verifying  : 1:perl-Compress-Raw-Zlib-2.061-4.el7.x86_64
9/16
  Verifying  : libpmem-1.5.1-2.1.0.1.el7.x86_64
10/16
  Verifying  : MariaDB-client-10.7.4-1.el7.centos.x86_64
11/16
  Verifying  : perl-Net-Daemon-0.48-5.el7.noarch
12/16
  Verifying  : perl-DBI-1.627-4.el7.x86_64
13/16
  Verifying  : socat-1.7.3.2-2.el7.x86_64
14/16
  Verifying  : perl-PlRPC-0.2020-14.el7.noarch
15/16
  Verifying  : MariaDB-compat-10.7.4-1.el7.centos.x86_64
16/16

Installed:
  MariaDB-server.x86_64 0:10.7.4-1.el7.centos

Dependency Installed:
  MariaDB-client.x86_64 0:10.7.4-1.el7.centos       MariaDB-common.x86_64 0:10.7.4-1.el7.centos
  MariaDB-compat.x86_64 0:10.7.4-1.el7.centos       boost-program-options.x86_64 0:1.53.0-28.el7
  galera-4.x86_64 0:26.4.11-1.el7.centos            libpmem.x86_64 0:1.5.1-2.1.0.1.el7
  pcre2.x86_64 0:10.23-2.el7                        perl-Compress-Raw-Bzip2.x86_64 0:2.061-3.el7
  perl-Compress-Raw-Zlib.x86_64 1:2.061-4.el7       perl-DBI.x86_64 0:1.627-4.el7
  perl-Data-Dumper.x86_64 0:2.145-3.el7             perl-IO-Compress.noarch 0:2.061-2.el7
  perl-Net-Daemon.noarch 0:0.48-5.el7               perl-PlRPC.noarch 0:0.2020-14.el7
  socat.x86_64 0:1.7.3.2-2.el7

Complete!
[root@mariagalera01 ~]#
```

4 Configure MariaDB & Galera on All Nodes

```
[root@mariagalera01 ~]# vi /etc/my.cnf.d/server.cnf
```

```
[root@mariagalera01 ~]# cat /etc/my.cnf.d/server.cnf
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not clients) should see
#
# See the examples of server my.cnf files in /usr/share/mysql/
#

# this is read by the standalone daemon and embedded servers
[server]

# this is only for the mysqld standalone daemon
[mysqld]
log_error=/var/log/mariadb.log
#
# * Galera-related settings
#
[galera]
# Mandatory settings
wsrep_on=ON
wsrep_provider=/usr/lib64/galera-4/libgalera_smm.so
wsrep_cluster_address=gcomm://10.77.0.195,10.77.0.143,10.77.0.67
binlog_format=row
default_storage_engine=InnoDB
innodb_autoinc_lock_mode=2
## Galera Cluster Configuration
wsrep_cluster_name="galeracluster1"
## Galera Synchronization Configuration
wsrep_sst_method=rsync
## Galera Node Configuration
wsrep_node_address="10.77.0.195"
wsrep_node_name="mariagalera01"
#
# Allow server to accept connections on all interfaces.
#
bind-address=0.0.0.0
#
# Optional setting
#wsrep_slave_threads=1
#innodb_flush_log_at_trx_commit=0

# this is only for embedded server
[embedded]

# This group is only read by MariaDB servers, not by MySQL.
# If you use the same .cnf file for MySQL and MariaDB,
# you can put MariaDB-only options here
[mariadb]

# This group is only read by MariaDB-10.7 servers.
# If you use the same .cnf file for MariaDB of different versions,
# use this group for options that older servers don't understand
[mariadb-10.7]

[root@mariagalera01 ~]# touch /var/log/mariadb.log
[root@mariagalera01 ~]# id mysql
uid=27(mysql) gid=27(mysql) groups=27(mysql)
[root@mariagalera01 ~]# chown mysql:mysql /var/log/mariadb.log
[root@mariagalera01 ~]#
```

```
[root@mariagalera02 ~]# vi /etc/my.cnf.d/server.cnf; cat /etc/my.cnf.d/server.cnf;
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not clients) should see
#
# See the examples of server my.cnf files in /usr/share/mysql/
#

# this is read by the standalone daemon and embedded servers
[server]

# this is only for the mysqld standalone daemon
```

```
[mysqld]
log_error=/var/log/mariadb.log
#
# * Galera-related settings
#
[galera]
# Mandatory settings
wsrep_on=ON
wsrep_provider=/usr/lib64/galera-4/libgalera_smm.so
wsrep_cluster_address=gcomm://10.77.0.195,10.77.0.143,10.77.0.67
binlog_format=row
default_storage_engine=InnoDB
innodb_autoinc_lock_mode=2
## Galera Cluster Configuration
wsrep_cluster_name="galeracluster1"
## Galera Synchronization Configuration
wsrep_sst_method=rsync
## Galera Node Configuration
wsrep_node_address="10.77.0.143"
wsrep_node_name="mariagalera02"
#
# Allow server to accept connections on all interfaces.
#
bind-address=0.0.0.0
#
# Optional setting
#wsrep_slave_threads=1
#innodb_flush_log_at_trx_commit=0

# this is only for embedded server
[embedded]

# This group is only read by MariaDB servers, not by MySQL.
# If you use the same .cnf file for MySQL and MariaDB,
# you can put MariaDB-only options here
[mariadb]

# This group is only read by MariaDB-10.7 servers.
# If you use the same .cnf file for MariaDB of different versions,
# use this group for options that older servers don't understand
[mariadb-10.7]

[root@mariagalera02 ~]# touch /var/log/mariadb.log
[root@mariagalera02 ~]# chown mysql:mysql /var/log/mariadb.log
[root@mariagalera02 ~]#
```

```
[root@mariagalera03 ~]# vi /etc/my.cnf.d/server.cnf; cat /etc/my.cnf.d/server.cnf;
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not clients) should see
#
# See the examples of server my.cnf files in /usr/share/mysql/
#

# this is read by the standalone daemon and embedded servers
[server]

# this is only for the mysqld standalone daemon
[mysqld]
log_error=/var/log/mariadb.log
#
# * Galera-related settings
#
[galera]
# Mandatory settings
wsrep_on=ON
wsrep_provider=/usr/lib64/galera-4/libgalera_smm.so
wsrep_cluster_address=gcomm://10.77.0.195,10.77.0.143,10.77.0.67
binlog_format=row
default_storage_engine=InnoDB
innodb_autoinc_lock_mode=2
## Galera Cluster Configuration
```

```
wsrep_cluster_name="galeracluster1"
## Galera Synchronization Configuration
wsrep_sst_method=rsync
## Galera Node Configuration
wsrep_node_address="10.77.0.67"
wsrep_node_name="mariagalera03"
#
# Allow server to accept connections on all interfaces.
#
bind-address=0.0.0.0
#
# Optional setting
#wsrep_slave_threads=1
#innodb_flush_log_at_trx_commit=0

# this is only for embedded server
[embedded]

# This group is only read by MariaDB servers, not by MySQL.
# If you use the same .cnf file for MySQL and MariaDB,
# you can put MariaDB-only options here
[mariadb]

# This group is only read by MariaDB-10.7 servers.
# If you use the same .cnf file for MariaDB of different versions,
# use this group for options that older servers don't understand
[mariadb-10.7]

[root@mariagalera03 ~]# touch /var/log/mariadb.log
[root@mariagalera03 ~]# chown mysql:mysql /var/log/mariadb.log
[root@mariagalera03 ~]#
```

5   Create Cluster on First Node Only

```
[root@mariagalera01 ~]# galera_new_cluster
[root@mariagalera01 ~]#
```

6   Stop Firewall on All Nodes

```
[root@mariagalera01 ~]# systemctl stop firewalld
[root@mariagalera01 ~]# systemctl disable firewalld
Removed symlink /etc/systemd/system/multi-user.target.wants/firewalld.service.
Removed symlink /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.
[root@mariagalera01 ~]#
```

7   Secure MariaDB Installation on All Nodes

```
[root@mariagalera01 ~]# mariadb-secure-installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
      SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user. If you've just installed MariaDB, and
haven't set the root password yet, you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

Setting the root password or using the unix_socket ensures that nobody
can log into the MariaDB root user without the proper authorisation.
```

```
You already have your root account protected, so you can safely answer 'n'.

Switch to unix_socket authentication [Y/n] Y
Enabled successfully!
Reloading privilege tables..
 ... Success!


You already have your root account protected, so you can safely answer 'n'.

Change the root password? [Y/n] Y
New password: oracle789
Re-enter new password: oracle789
Password updated successfully!
Reloading privilege tables..
 ... Success!


By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB without having to have a user account created for
them.  This is intended only for testing, and to make the installation
go a bit smoother.  You should remove them before moving into a
production environment.

Remove anonymous users? [Y/n] Y
 ... Success!

Normally, root should only be allowed to connect from 'localhost'.  This
ensures that someone cannot guess at the root password from the network.

Disallow root login remotely? [Y/n] Y
 ... Success!

By default, MariaDB comes with a database named 'test' that anyone can
access.  This is also intended only for testing, and should be removed
before moving into a production environment.

Remove test database and access to it? [Y/n] Y
 - Dropping test database...
 ... Success!
 - Removing privileges on test database...
 ... Success!

Reloading the privilege tables will ensure that all changes made so far
will take effect immediately.

Reload privilege tables now? [Y/n] Y
 ... Success!

Cleaning up...

All done!  If you've completed all of the above steps, your MariaDB
installation should now be secure.

Thanks for using MariaDB!
[root@mariagalera01 ~]#
```

8   Startup First Node

```
[root@mariagalera01 ~]# mysql -u root -p -e "SHOW STATUS LIKE 'wsrep_cluster_size'"
Enter password:
+--------------------+-------+
| Variable_name      | Value |
+--------------------+-------+
| wsrep_cluster_size | 1     |
+--------------------+-------+
[root@mariagalera01 ~]#
```

9 Startup Second Node

```
[root@mariagalera02 ~]# systemctl start mariadb
[root@mariagalera02 ~]# systemctl status mariadb
● mariadb.service - MariaDB 10.7.4 database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; disabled; vendor preset: disabled)
  Drop-In: /etc/systemd/system/mariadb.service.d
           └─migrated-from-my.cnf-settings.conf
   Active: active (running) since Wed 2022-06-01 15:02:59 GMT; 7s ago
     Docs: man:mariadbd(8)
           https://mariadb.com/kb/en/library/systemd/
  Process: 6102 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited,
status=0/SUCCESS)
  Process: 5832 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= ||   VAR=`cd /usr/bin/..;
/usr/bin/galera_recovery`; [ $? -eq 0 ]   && systemctl set-environment _WSREP_START_POSITION=$VAR || exit 1
(code=exited, status=0/SUCCESS)
  Process: 5830 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited,
status=0/SUCCESS)
 Main PID: 5896 (mariadbd)
   Status: "Taking your SQL requests now..."
   Memory: 184.3M
   CGroup: /system.slice/mariadb.service
           └─5896 /usr/sbin/mariadbd --wsrep_start_position=00000000-0000-0000-0000-000000000000:-1

Jun 01 15:02:57 mariagalera02 rsyncd[6058]: receiving file list
Jun 01 15:02:57 mariagalera02 rsyncd[6059]: receiving file list
Jun 01 15:02:57 mariagalera02 rsyncd[6059]: sent 48 bytes  received 270 bytes  total size 67
Jun 01 15:02:57 mariagalera02 rsyncd[6062]: connect from mariagalera01.sub02051503110.vcnesd2.oraclevcn.com
(10.77.0.195)
Jun 01 15:02:57 mariagalera02 rsyncd[6062]: rsync to rsync_sst/./sys from
mariagalera01.sub02051503110.vcnesd2.oraclevcn.com (10.77.0.195)
Jun 01 15:02:57 mariagalera02 rsyncd[6062]: receiving file list
Jun 01 15:02:57 mariagalera02 rsyncd[6065]: connect from mariagalera01.sub02051503110.vcnesd2.oraclevcn.com
(10.77.0.195)
Jun 01 15:02:57 mariagalera02 rsyncd[6065]: rsync to rsync_sst/ from
mariagalera01.sub02051503110.vcnesd2.oraclevcn.com (10.77.0.195)
Jun 01 15:02:57 mariagalera02 rsyncd[6065]: receiving file list
Jun 01 15:02:59 mariagalera02 systemd[1]: Started MariaDB 10.7.4 database server.
[root@mariagalera02 ~]# mysql -u root -p -e "SHOW STATUS LIKE 'wsrep_cluster_size'"
Enter password:
+--------------------+-------+
| Variable_name      | Value |
+--------------------+-------+
| wsrep_cluster_size | 2     |
+--------------------+-------+
[root@mariagalera02 ~]#
```

10 Startup Third Node

```
[root@mariagalera03 ~]# systemctl start mariadb
[root@mariagalera03 ~]# systemctl status mariadb
● mariadb.service - MariaDB 10.7.4 database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; disabled; vendor preset: disabled)
  Drop-In: /etc/systemd/system/mariadb.service.d
           └─migrated-from-my.cnf-settings.conf
   Active: active (running) since Wed 2022-06-01 15:05:37 GMT; 5s ago
     Docs: man:mariadbd(8)
           https://mariadb.com/kb/en/library/systemd/
  Process: 6256 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited,
status=0/SUCCESS)
  Process: 5983 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= ||   VAR=`cd /usr/bin/..;
/usr/bin/galera_recovery`; [ $? -eq 0 ]   && systemctl set-environment _WSREP_START_POSITION=$VAR || exit 1
(code=exited, status=0/SUCCESS)
  Process: 5981 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited,
status=0/SUCCESS)
 Main PID: 6049 (mariadbd)
   Status: "Taking your SQL requests now..."
```

```
    Memory: 190.3M
    CGroup: /system.slice/mariadb.service
            └─6049 /usr/sbin/mariadbd --wsrep_start_position=00000000-0000-0000-0000-000000000000:-1

Jun 01 15:05:35 mariagalera03 rsyncd[6212]: rsync to rsync_sst/./mysql from
mariagalera01.sub02051503110.vcnesd2.oraclevcn.com (10.77.0.195)
Jun 01 15:05:35 mariagalera03 rsyncd[6213]: receiving file list
Jun 01 15:05:35 mariagalera03 rsyncd[6212]: receiving file list
Jun 01 15:05:35 mariagalera03 rsyncd[6216]: connect from mariagalera01.sub02051503110.vcnesd2.oraclevcn.com
(10.77.0.195)
Jun 01 15:05:35 mariagalera03 rsyncd[6216]: rsync to rsync_sst/./sys from
mariagalera01.sub02051503110.vcnesd2.oraclevcn.com (10.77.0.195)
Jun 01 15:05:35 mariagalera03 rsyncd[6216]: receiving file list
Jun 01 15:05:35 mariagalera03 rsyncd[6218]: connect from mariagalera01.sub02051503110.vcnesd2.oraclevcn.com
(10.77.0.195)
Jun 01 15:05:35 mariagalera03 rsyncd[6218]: rsync to rsync_sst/ from
mariagalera01.sub02051503110.vcnesd2.oraclevcn.com (10.77.0.195)
Jun 01 15:05:35 mariagalera03 rsyncd[6218]: receiving file list
Jun 01 15:05:37 mariagalera03 systemd[1]: Started MariaDB 10.7.4 database server.
[root@mariagalera03 ~]# mysql -u root -p -e "SHOW STATUS LIKE 'wsrep_cluster_size'"
Enter password:
+--------------------+-------+
| Variable_name      | Value |
+--------------------+-------+
| wsrep_cluster_size | 3     |
+--------------------+-------+
[root@mariagalera03 ~]#
```

11 Replication Test

```
[opc@mariagalera01 ~]$ mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.7.4-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> select * from musics.equipment;
+----+-------------------------+-------+-------+
| id | type                    | quant | color |
+----+-------------------------+-------+-------+
|  2 | slide                   |     2 | blue  |
|  6 | PRS Guitar              |    13 | Brown |
|  8 | Yamaha Piano            |     3 | Black |
|  9 | Meinl Hihat             |     8 | Gold  |
| 12 | Fender Telecaster Guitar |    4 | Brown |
| 14 | Musicman Bass           |     4 | Black |
+----+-------------------------+-------+-------+
6 rows in set (0.001 sec)

MariaDB [(none)]> exit
Bye
[opc@mariagalera01 ~]$
```

```
MariaDB [musics]> select * from equipment;
+----+--------------+-------+-------+
| id | type         | quant | color |
+----+--------------+-------+-------+
|  2 | slide        |     2 | blue  |
|  6 | PRS Guitar   |    13 | Brown |
|  8 | Yamaha Piano |     3 | Black |
|  9 | Meinl Hihat  |     8 | Gold  |
+----+--------------+-------+-------+
4 rows in set (0.000 sec)

MariaDB [musics]> select * from equipment;
```

```
+----+-------------------------+-------+-------+
| id | type                    | quant | color |
+----+-------------------------+-------+-------+
|  2 | slide                   |     2 | blue  |
|  6 | PRS Guitar              |    13 | Brown |
|  8 | Yamaha Piano            |     3 | Black |
|  9 | Meinl Hihat             |     8 | Gold  |
| 12 | Fender Telecaster Guitar |    4 | Brown |
| 14 | Musicman Bass           |     4 | Black |
+----+-------------------------+-------+-------+
6 rows in set (0.000 sec)

MariaDB [musics]> exit
Bye
[opc@mariagalera02 ~]$
```