

Distributed Transactional Database

HotDB Server -

[Installation & Deployment]

Function Manual

Version No.: V2.5.6

Shanghai Hotpu Networks Technology Co., Ltd.

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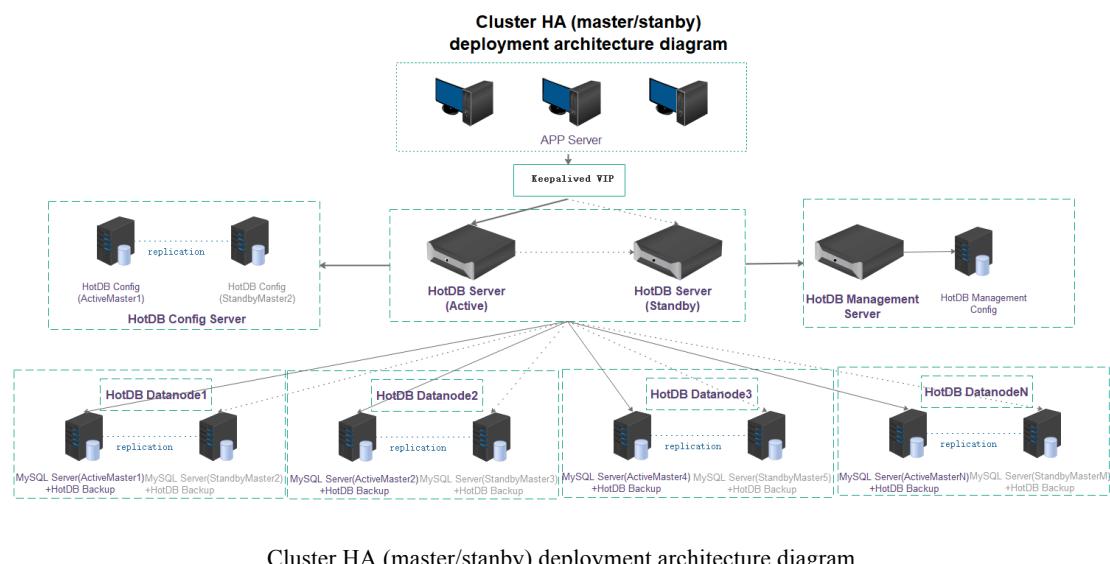
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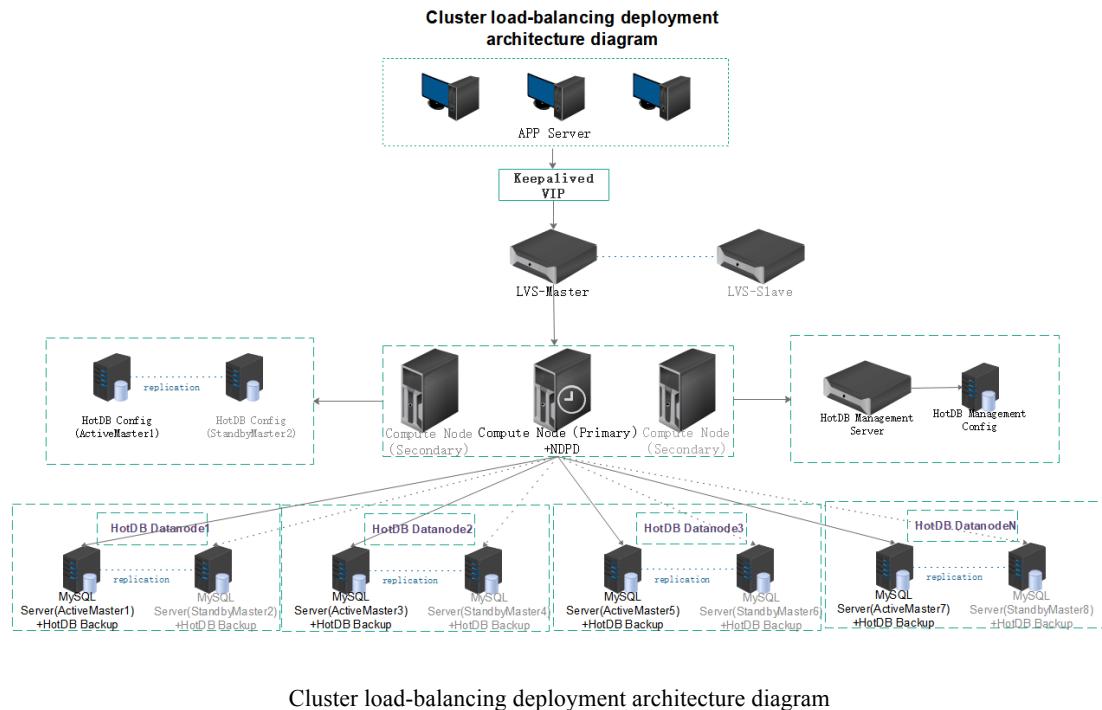
1. Deployment environment

HotDB Server cluster deployment has certain requirements for the server, operating system and depended-upon software, etc., and the cluster deployed in non-compliant environment may not be usable or may not meet the use requirements. It's suggested making detailed understanding of the [Description of Requirements](#) of HotDB Server cluster deployment for environment before deployment.

This document will describe in detail how to deploy a set of HotDB Server clusters in single-IDC mode. If you want to know what you need to pay attention to when you enable the disaster recovery mode, please refer to the “Installation and deployment” chapter of the [Distributed Transactional Database HotDB Server - Cross-IDC Disaster Recovery Function Specification](#).

1.1. Deployment architecture diagram





Note: Please refer to “Figure 1-1 Cluster HA (master/standby) deployment architecture diagram” for cluster single-node deployment architecture diagram, in addition to that there are no “HotDB Server (standby), VIP” in single node, and the rest is consistent with that of HA diagram.

1.2. Environment description

Server: It's recommended using physical server for production environment, while virtual machine for testing environment. You must use physical server for performance test (if necessary).

Operating system: 64-bit CentOS 6.x, 7.x or RHEL 6.x, 7.x are recommended, while other operating systems are not supported at present.

Depended-upon software: Running of HotDB Server (Distributed Transactional Database) and HotDB Management (Distributed Transactional Database Platform) shall depend on JAVA environment. It's recommended installing JDK1.7.0_80 environment on the server where compute node or HotDB Management are deployed.

Recommended configuration:

Refer to *Distributed Transactional Database Product HotDB Server Hardware Configuration Recommendation --- Shanghai Hotpu Networks Technology Co.,Ltd* for hardware environment configuration

Refer to *Distributed Transactional Database HotDB Server - [Description of Cluster Environment Requirements]* for cluster running environment configuration requirements and recommendation

2. Deployment

Deployment of HotDB Server cluster could be either manually installed offline, or automatically installed via “Cluster Deployment” or “Single Component Deployment” on the management platform.

2.1. Manual deployment

Manual deployment method of single compute node and HA (master/standby) compute node cluster will be introduced respectively below, and for load-balancing multiple compute node cluster, automatic deployment via “[Cluster Deployment](#)” is recommended.

2.1.1. Single node cluster deployment

Descriptions of teaching environment of single-node deployment and the deployment components are as follow:

Deployment environment:

Item	Name
Server Properties	Virtual Machine
Operating System	CentOS Linux release 7.6.1810 (Core)
MySQL Version	MySQL 5.7.25
JDK	JDK1.7_80

Deployment components:

Component name	Number of installations
Compute Node	1

Management Platform	1
ConfigDB	1
Data Source	4

Note: For description of the component name, refer to the document *Distributed Transactional Database Product HotDB Server - [Explanation of Terms] Function Manual*

2.1.1.1. Compute node

JDK V1.7 is recommended for compute node V2.5.6 below;

JDK V1.8 is recommended for compute node V2.5.6 or above.

For the installation of JDK V1.7, 64-bit JDK1.7_80 is recommended. Acquire RPM installation package of JDK from JAVA official website, and upload to the server or contact the supplier of HotDB.

- Execute the following command, and install JDK to the directory: /usr/local/

```
# rpm -ivh jdk-7u80-linux-x64.rpm --prefix=/usr/java/
```

- Configure JDK environment variables

Open and edit the /etc/profile file:

```
#vi /etc/profile
```

Add the following information to the end of the file:

```
export JAVA_HOME=/usr/java/jdk1.7.0_80
```

```
export PATH=$JAVA_HOME/bin:$PATH
```

Execute source command, and make the newly-added environment variables come into effect:

```
#source /etc/profile
```

For the installation of JDK V1.8, OpenJDK8 installation package is recommended, and its operating steps are recommended as follows:

Upload OpenJDK8 installation package

You can upload OpenJDK8U-jdk_x64_linux_hotspot_8u252b09.tar.gz installation package using rz command or ftp file transfer tool. The installation package can be obtained by contacting HotDB.

Unzip the installation package

```
#mkdir -p /usr/local/jdk8
```

```
#tar -xvf OpenJDK8U-jdk_x64_linux_hotspot_8u252b09.tar.gz -C /usr/local/jdk8
```

1. Check glibc

The service authorization of compute node requires the installation of the driver package of encrypted lock, which depends on 32-bit glibc. Therefore, before installing the compute node, you must check whether the server contains 32-bit glibc. If it is detected that it is not installed, you need to install it manually before proceeding.

Check the installation of glibc on the server: (it is normal to output glibc version info)

```
# rpm -q glibc |egrep 'glibc.*i.86.*'
```

2. Install ConfigDB

ConfigDB and Compute Node could be either installed on the same server, or installed individually. Refer to “[ConfigDB Installation Instruction](#)” for detailed steps.

3. Service Authorization

To start normally and provide service, HotDB Server shall acquire formal authorization and privilege from Shanghai Hotpu Networks Technology Co.,Ltd, which could be interpreted as license is necessary. Please refer to [Distributed Transactional Database HotDB Server \[Service Authorization\] Function Manual](#) for detailed service authorization instruction.

4. Install compute node

To install compute node, it needs to unzip the compute node installation package, modify the compute node configuration file server.xml, and then import the configDB table structure into the installed MySQL configDB instance.

Upload the binary package of hotdb-server-2.5.0-xxx.tar.gz to the server, create installation directory of HotDB Server, and unzip HotDB Server to the installation directory.

```
#mkdir /usr/local/hotdb
#tar -zvxf hotdb-server-2.5.0-xxx.tar.gz -C /usr/local/hotdb/
```

ConfigDB table structure is under installation directory /conf of compute node, and table structure could be imported into configDB using the following commands. (Importing table structure will create configDBhotdb_config)

```
#mysql -uroot --socket=/data/mysql/data3306/sock/mysql.sock < /usr/local/hotdb/hotdb-
server/conf/hotdb_config.sql
```

5. Add configDB account

If compute node is to have access to configDB, access account shall be added to configDB MySQL instance. Log in to configDB to execute the following MySQL statements, and create configDB account “hotdb_config”.

Create hotdb_config account

```
create user 'hotdb_config'@'%' identified by 'hotdb_config';
```

Grant

```
GRANT select,insert,update,delete,create,drop,index,alter,reload,references,create temporary tables,super,lock
tables,replication slave,replication client ON *.* TO 'hotdb_config'@'%';
```

6. Modify compute node configuration file

The configuration file server.xml to be modified is under installation directory /conf of compute node. Compute node connection to configDB and port number (the default port number could be directly used without special requirements) and other parameters

shall be set.

```
#vi /usr/local/hotdb/hotdb-server/conf/server.xml

<property name="url">jdbc:mysql://192.168.200.1:3306/hotdb_config</property><!-- configDB address -->

<property name="username">hotdb_config</property><!-- configDB username -->

<property name="password">hotdb_config</property><!-- configDB password -->

<property name="service port">3323</property><!-- service port -->

<property name="management port">3325</property><!-- management port -->
```

Note: If configDB and compute node are installed on the same server, then the configDB IP address in the server.xml still requires specific IP address and can't be substituted by 127.0.0.1.

7. Start and stop compute node

Compute node startup script “hotdb_server” is under installation directory /bin of compute node. It could be started or stopped merely by executing the following commands

Start compute node service

```
#cd /usr/local/hotdb/hotdb-server/bin

#sh hotdb_server start
```

Check whether compute node is successfully started or not

```
#jps | grep -i HotdbStartup
```

```
19833 HotdbStartup
```

Stop compute node service

```
#kill 19833 or sh hotdb_server stop
```

Description:

- In case of abnormal start, view the compute node log “hotdb.log” under the installable directory /logs. Execute the log view command:

```
tail -f /usr/local/hotdb/hotdb-server/logs/hotdb.log.
```
- If the server is unauthorized, or the installed compute node service is unauthorized, both of which could result in start failure of compute node service.

2.1.1.2. Management platform

JDK needs to be installed synchronously on the management platform before deployment. JDK V1.7 is recommended for V2.5.6 below; JDK V1.8 is recommended for V2.5.6 or above. The installation steps are consistent with the description in section 2.1.1.1.

1. Unzip the management platform installation package

Upload the binary package of hotdb-management-2.x.x-xxx.tar.gz to the server installation directory, and execute the following command.

```
#cd /usr/local/hotdb
#tar -zvxf hotdb-management-2.x.x-xxx.tar.gz
```

2. Import management platform configDB table structure

Management platform configDB and compute node configDB could share one MySQL instance, which is not recommended in production environment. Management platform configDB table structure is under its installation directory /doc, and before using the Import Configuration command, the account “hotdb_cloud” of management platform connection to configDB shall be created in configDB first.

Create hotdb_cloud account

```
create user 'hotdb_cloud'@'%' identified by 'hotdb_cloud';
```

Grant

```
GRANT select,insert,update,delete,create,drop,index,alter,references ON *.* TO 'hotdb_cloud'@'%';
```

Import management platform into configDB

```
#mysql -uroot --socket=/data/mysqlidata3306/sock/mysql.sock < /usr/local/hotdb/hotdb-
management/doc/hotdb_cloud_config.sql
```

3. Modify management platform configuration file

The modified configuration file is “application.properties” under the management platform installation directory /conf, and it mainly modifies the connection information, port number of management platform toward configDB and language setting (the default port number and language could be directly used if no special requirements).

Edit configuration file

```
#vi /usr/local/hotdb/hotdb-management/conf/application.properties
```

Modify parameter information

```
# management platform listening port
```

```
server.port=3324
```

```
#Hotdb Backup Listening Port
```

```
server.backup.port=3322
```

```
#HotDB Management configDB address
```

```
spring.datasource.url=jdbc:mysql://192.168.200.1:3306/hotdb_cloud_config?useUnicode=true&characterEncoding
=UTF-8&autoReconnect=true&connectTimeout=3000
```

```
#HotDB Management configDB username
```

```
spring.datasource.username=hotdb_cloud
```

```
#HotDB Management configDB password

spring.datasource.password=hotdb_cloud

#HotDB Management language setting, English by default, you can set it as Chinese if necessary

language=English/Chinese
```

4. Start and stop management platform

The management platform startup script “hotdb_management” is under its installation directory /bin. Management platform service could be started or stopped merely by executing the following commands.

Enter startup script directory

```
#cd /usr/local/hotdb/hotdb-management/bin
```

Start management platform service

```
#sh hotdb_management start
```

View whether the service is successfully started or not (if yes, open and log in management platform via browser)

```
#jps | grep -i hotdb-management
```

```
6595 hotdb-management-xxx.jar
```

Stop management platform service

```
#kill 6595 or sh hotdb_management stop
```

2.1.1.3. ConfigDB

ConfigDB is actually a standard MySQL instance, and it is mainly used for storing

relevant configuration information for compute node or management platform. At present, configDB is supported to run in three forms: single database, master/standby and MGR.

Description: A MySQL instance with port number 3306 will be as configDB by means of RPM in the following. Refer to official installation instruction of MySQL for installation by other means.

1. Download MySQL rpm package

You can download MySQL5.6.32 version from MySQL official website to the server. The following versions are recommended for centos6.x system, and please refer to official instruction to download corresponding versions for other systems

http://dev.mysql.com/get/Downloads/MySQL-5.6/MySQL-shared-compat-5.6.32-1.el6.x86_64.rpm

http://dev.mysql.com/get/Downloads/MySQL-5.6/MySQL-devel-5.6.32-1.el6.x86_64.rpm

http://dev.mysql.com/get/Downloads/MySQL-5.6/MySQL-client-5.6.32-1.el6.x86_64.rpm

http://dev.mysql.com/get/Downloads/MySQL-5.6/MySQL-server-5.6.32-1.el6.x86_64.rpm

http://dev.mysql.com/get/Downloads/MySQL-5.6/MySQL-shared-5.6.32-1.el6.x86_64.rpm

2. Uninstall MariaDB

If MariaDB has been installed, then MySQL could be installed only after uninstallation of MariaDB. View the MariaDB installation condition and uninstallation reference as follow:

View whether the command is installed or not:

```
# rpm -qa|grep mariadb
```

```
mariadb-libs-5.5.44-2.el7.centos.x86_64
```

Uninstall MariaDB command:

```
# yum remove mariadb-libs-5.5.44-2.el7.centos.x86_64
```

3. Install MySQL rpm package

Upload MySQL rpm package to the server and execute rpm command to install MySQL

```
#yum -y localinstall --nogpgcheck MySQL-server-5.6.32-1.el6.x86_64.rpm           MySQL-shared-compat-  
5.6.32-1.el6.x86_64.rpm MySQL-devel-5.6.32-1.el6.x86_64.rpm                  MySQL-client-5.6.32-  
1.el6.x86_64.rpm MySQL-shared-5.6.32-1.el6.x86_64.rpm
```

Or execute

```
#yum -y localinstall MySQL-*.rpm
```

4. MySQL configuration file

Copy the following contents and substitute original contents in /etc/my.cnf file of the server

```
[client]  
  
default-character-set=utf8  
  
[mysqld_safe]  
  
basedir=/usr/sbin  
  
user=mysql  
  
open-files-limit=8192  
  
[mysqld_multi]  
  
mysqld = /usr/bin/mysqld_safe  
  
user = root  
  
log = /data/multi.log  
  
[mysqld]
```

```
*****common parameters*****
```

```
basedir=/usr
```

```
skip-federated
```

```
skip-blackhole
```

```
skip-name-resolve
```

```
skip_external_locking
```

```
flush=OFF
```

```
performance_schema=0
```

```
event-scheduler=ON
```

```
default-storage-engine=InnoDB
```

```
character_set_server=utf8
```

```
collation_server=utf8_general_ci
```

```
lower_case_table_names=1
```

```
explicit_defaults_for_timestamp
```

```
sql_mode='STRICT_TRANS_TABLES,NO_ENGINE_SUBSTITUTION'
```

```
user=mysql
```

```
port=3306
```

```
pid-file=/data/mysql_data3306/sock/mysql.pid
```

```
socket=/data/mysql_data3306/sock/mysql.sock
```

```
datadir=/data/mysql_data3306/mydata
```

```
tmpdir=/data/mysql_data3306/tmpdir
```

group_concat_max_len=1048576

back_log=1000

max_connections=8000

max_user_connections=7900

thread_cache_size=128

max_connect_errors=99999

wait_timeout=172800

interactive_timeout=172800

net_buffer_length=8K

max_allowed_packet=64M

max_heap_table_size=1G

tmp_table_size=2M

sort_buffer_size=8M

max_length_for_sort_data=16k

join_buffer_size=4M #bka

read_rnd_buffer_size=8M #mrr

table_open_cache=1024

table_open_cache_instances=16

query_cache_type=0

query_cache_size=0

#query_cache_limit=1M

```
***** Logs related settings *****
```

```
#general_log
```

```
general_log_file=/data/mysqlidata3306/log/general.log
```

```
log-error=/data/mysqlidata3306/log/error.log
```

```
long_query_time=1
```

```
slow_query_log
```

```
slow_query_log_file=/data/mysqlidata3306/log/slow-query.log
```

```
#log_queries_not_using_indexes
```

```
log_warnings = 2
```

```
log-bin-index=/data/mysqlidata3306/binlog/mysql-bin.index
```

```
log-bin=/data/mysqlidata3306/binlog/mysql-bin
```

```
relay-log-index=/data/mysqlidata3306/relaylog/mysql-relay-bin.index
```

```
relay-log=/data/mysqlidata3306/relaylog/mysql-relay-bin
```

```
binlog_cache_size=256K
```

```
max_binlog_size=512M
```

```
binlog-format=MIXED
```

```
binlog-checksum=CRC32
```

```
sync_binlog=0
```

```
expire_logs_days=10
```

```
***** Replication related settings *****
```

```
server-id= 3306
```

```
#skip-slave-start

log_slave_updates=1

log_bin_trust_function_creators=1

auto_increment_increment=1

auto_increment_offset=1

allow-suspicious-udfs

innodb_support_xa=1

sysdate-is-now

***** MyISAM Specific options *****

key_buffer_size=8M

bulk_insert_buffer_size=16M

myisam_sort_buffer_size=64M

myisam_max_sort_file_size=10G

myisam_repair_threads=1

myisam-recover-options=default

read_buffer_size=1M

***** INNODB Specific options *****

innodb_use_sys_malloc=1

#innodb_additional_mem_pool_size=32M

innodb_buffer_pool_size=4G

innodb_buffer_pool_instances=2
```

innodb_max_dirty_pages_pct=40

innodb_sort_buffer_size=16M

innodb_data_home_dir=/data/mysqldata3306/innodb_ts

innodb_data_file_path=ibdata1:1024M:autoextend

innodb_autoextend_increment=128

innodb_file_per_table

innodb_open_files=7168

innodb_file_format=Barracuda

innodb_file_format_check=1

innodb_fast_shutdown=1

innodb_force_recovery=0

innodb_flush_log_at_trx_commit=2

innodb_log_buffer_size=64M

innodb_log_file_size=1G

innodb_log_files_in_group=2

innodb_log_group_home_dir=/data/mysqldata3306/innodb_log

innodb_adaptive_flushing_lwm=30

innodb_read_io_threads=8

innodb_write_io_threads=8

innodb_io_capacity=200

innodb_flush_method=O_DIRECT

innodb_flush_neighbors=0

innodb_lru_scan_depth=1024

innodb_change_buffering=all

innodb_purge_threads

innodb_commit_concurrency=0

innodb_thread_concurrency=0

innodb_concurrency_tickets=1024

innodb_autoinc_lock_mode=1

innodb_stats_on_metadata=0

innodb_lock_wait_timeout=120

innodb_rollback_on_timeout=1

[mysqldump]

quick

max_allowed_packet=2G

default-character-set=utf8

[mysql]

no-auto-rehash

prompt="\u00d7@\u000b : \d \r:\m:\s> "

default-character-set=utf8

show-warnings

[myisamchk]

```
key_buffer=512M
```

```
sort_buffer_size=512M
```

```
read_buffer=8M
```

```
write_buffer=8M
```

```
[mysqlhotcopy]
```

```
interactive-timeout
```

5. Create MySQL directory

According to directory parameters of my.cnf configuration file, create MySQL data directory, and set owner user of the data directory.

```
#mkdir -p /data/mysqldata3306

#mkdir -p /data/mysqldata3306/mydata

#mkdir -p /data/mysqldata3306/binlog

#mkdir -p /data/mysqldata3306/innodb_ts

#mkdir -p /data/mysqldata3306/innodb_log

#mkdir -p /data/mysqldata3306/relaylog

#mkdir -p /data/mysqldata3306/tmpdir

#mkdir -p /data/mysqldata3306/log

#mkdir -p /data/mysqldata3306/sock

#chown -R mysql:mysql /data/mysqldata3306
```

6. Initialize database

Execute mysql_install_db to initialize the system database to specified directory.

```
#mysql_install_db --defaults-file=/etc/my.cnf --user=mysql  
--datadir=/data/mysql/data3306/mydata
```

7. Start configDB MySQL instance

Use startup script of mysql to start the database.

Start MySQL service

```
#/etc/rc.d/init.d/mysql start
```

Use netstat command to detect whether MySQL is successfully started or not

```
#netstat -npl |grep mysql
```

The startup is successful if there is command output

Notice: Please modify the root user password timely after installation.

2.1.1.4. Data Source

Data Source is a standard MySQL instance in nature, and it is used for storing underlying transaction data of the whole set of clusters. The number of installations and the building of replication relation depend on the actual business scenarios.

Description: Please refer to description of “[ConfigDB](#)” for manual installation process of data source. “[Single Component Deployment](#)” of “[Cluster Deployment](#)” on the management platform are suggested for batch installation of data source.

Connection user: for the data source manually deployed and installed, it is required to create a database user for the compute node to connect to the data source instance.

Create a database user

```
#create user 'hotdb_datasource'@'%' identified by 'hotdb_datasource';

Grant user privilege

#GRANT select,insert,update,delete,create,drop,index,alter,process,references,super,reload,lock tables,replication
slave,replication client,trigger,show view,create view,create routine,create temporary tables,alter
routine,execute,event ON *.* TO 'hotdb_datasource'@'%';


```

Note: when the MySQL version of data source is greater than or equal to 8.0, one more privilege “xa_recover_admin” is added.

Backup user: for the data source manually deployed and installed, it is required to create a database user for the data backup function.

Create a database user

```
#create user 'dbbackup'@'%' identified by ' dbbackup';

Grant user privilege

# GRANT select,insert,update,delete,create,drop,index,alter,reload,process,references,super,lock tables,replication
slave,replication client,trigger,show view,create view,create routine,alter routine,event ON *.* TO
'dbbackup'@'127.0.0.1';
```

2.1.1.5. HotDB Backup

HotDB Backup is a distributed transactional database backup tool independently developed by Shanghai Hotpu Networks Technology Co.,Ltd. It is generally deployed on data source server of the cluster, and listens to the data backup request from the management platform. A data source server needs only one HotDB Backup to be deployed.

Notice for use:

- Only data backup of MySQL 5.6 and above versions is supported.
- The binlog must be enabled for the backed-up data source instance.
- Server of HotDB Management must have MySQL Client installed, otherwise, the backup will be affected.

1. Unzip HotDB Backup installation package

Upload binary package of “hotdb_backup-2.0-xxxxxxxx.tar.gz” to the server. Create installation directory of HotDB Backup, and unzip the HotDB Backup to the installation directory.

```
#mkdir /usr/local/hotdb/  
  
#tar -zvxf hotdb_backup-2.0-20190109.tar.gz -C /usr/local/hotdb/
```

2. Start and stop HotDB Backup

Start backup service program

```
#cd /usr/local/hotdb/hotdb_backup  
  
#sh bin/hotdb_backup start -h 192.168.220.104 -p 3322
```

Add ip of the management platform server behind -h, and add management platform listening HotDB Backup port number behind -p (generally 3322, but please view parameter server.backup.port in management platform configuration file application.properties specifically).

After successful start, the following logs will be printed

```
INFO: Start HotDB-backup ...  
  
INFO: HotDB-backup start successed.
```

Stop the backup service program

```
#sh bin/hotdb_backup stop
```

Print the following log after stopping successfully

```
INFO: Stopping HotDB-backup ...
```

```
INFO: HotDB-backup stopped success.
```

View running status of HotDB-Backup

```
#sh bin/hotdb_backup status
```

Prompt of already running:

```
INFO: HotDB-backup service already running (PID: 11709).
```

Prompt of not running:

```
INFO: HotDB-backup service not running.
```

View HotDB-Backup log

```
#cat logs/hotdb_backup.log
```

HotDB Backup common log

```
Start backup #
```

```
Start backup task
```

```
Backup is stopped #
```

```
Stop backup task
```

```
Connected to server successfully! #
```

```
HotDB Backup and HotDB Management are normally connected
```

```
Got a quit signal from user, will quit after backup is finished #
```

HotDB Backup exits normally

2.1.2. HA (master/standby) cluster deployment

Descriptions of master/standby node cluster deployment teaching environment and the deployment components are as follow:

Deployment environment:

Item	Name
Physical Server	Physical Server
Operating System	CentOS Linux release 7.6.1810 (Core)
MySQL Version	MySQL 5.7.25
JDK	JDK1.7_80

Deployment components

Component name	Number of installations
Compute Node	2
Keepalived	2
Management Platform	1
ConfigDB	1
Data Source	4

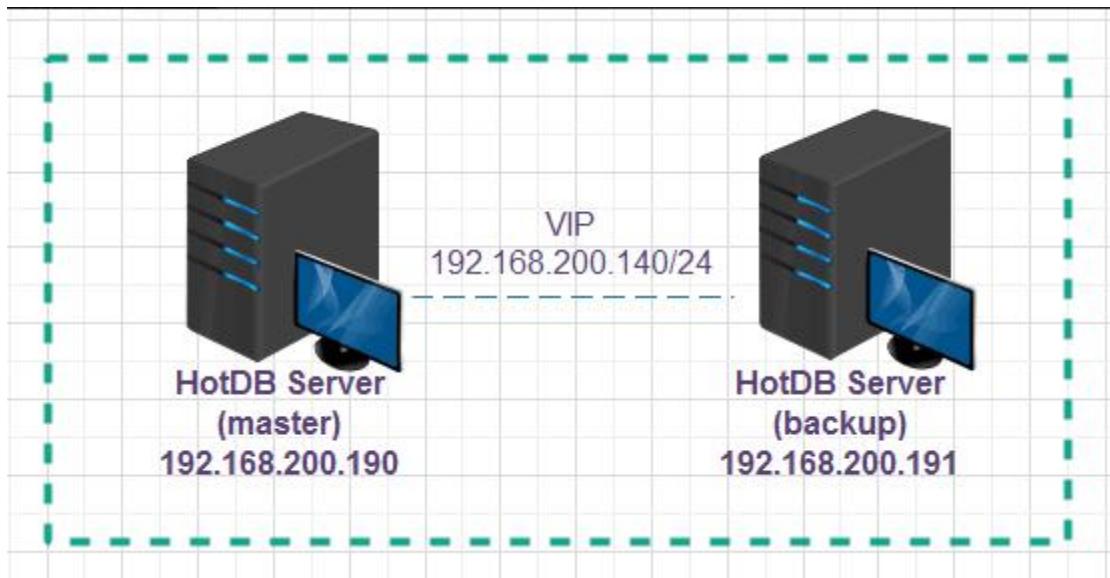
Note: For description of the component name, refer to the document [Distributed Transactional Database Product HotDB Server - \[Explanation of Terms\] Function Manual](#).

Special description:

This chapter mainly introduces compute node server.xml configuration, Keepalived installation and configuration, start instruction, high availability switch, etc. under HA cluster mode. Installation steps of compute node, management platform, configDB and Data Source will not be repeated in this chapter, and please refer to “[Single Node Cluster Deployment](#)” in the previous chapter for details.

Deployment planning:

Instance	IP	service port	management port	HA role
Master compute node	192.168.200.190	3323	3325	Master
Standby compute node	192.168.200.191	3323	3325	Slave



HA compute node deployment diagram

Note: The master/standby compute node servers are then installed with keepalived program respectively, and the VIP used is: 192.168.200.140

2.1.2.1. Compute node

1. Install master/standby compute node

Install compute node service respectively on 192.168.220.190 and 192.168.200.191, and refer to “[Compute Node](#)” in the previous chapter for the installation process.

2. Modify master/standby compute node configuration file

Corresponding configuration file server.xml of the deployed master/standby compute node shall be modified, and the detailed modification is as follow:

Modification of the server.xml configuration on master compute node 192.168.200.190

```
<property name="haState">master</property>< HA role, master node: master, backup node: backup>

<property name="haNodeHost"></property><HA role, other node IP:PORT>

<property name="VIP">192.168.200.140</property><virtual IP address>
```

Modification of the server.xml configuration on standby compute node 192.168.200.191

```
<property name="haState">backup</property>< HA role, master node: master, backup node: backup>

<property name="haNodeHost">192.168.200.190:3325</property><HA role, other node IP:PORT>

<property name="VIP">192.168.200.140</property><virtual IP address>
```

Description:

- haNodeHost in the configuration file is the master compute node's IP+management port, and such parameter only needs to be configured on standby compute node.
- When starting master/standby server, if haState plays as the master, service port (3323) and management port (3325) will be started; if it plays as the Backup, only management port (3325) will be started.
- At the time of master server failure, if keepalived detects that the service is not available, it will automatically switch vip to the backup server, and start the backup service port (3323), to guarantee service without interruption.

2.1.2.2. Keepalived

1. Install keepalived

keepalived could be installed either by means of yum, or by downloading installation tar package from keepalived official website

<https://www.keepalived.org/download.html>.

Install keepalived by means of yum (execute keepalived installation command on master/standby compute node service)

```
#yum -y install keepalived
```

Start or stop keepalived

```
#service keepalived start / server keepalived stop
```

View running status of keepalived

```
#service keepalived status
```

2. Modify keepalived configuration file

Keepalived configuration file is stored as “keepalived.conf” under /etc directory by default; **copy** the following instance contents to **substitute** contents in corresponding keepalived configuration file, and **make actual modification according to the position marked in red**. (the corresponding /conf directory in the standard HotDB Server installation package also contains keepalived configuration file of master/slave mode, which can also be copied directly to the /etc directory for customized modification.)

Keepalived configuration information of master compute node: 192.168.200.190:

```
! Configuration File for keepalived

global_defs {

router_id HotDB Server-ha

}

vrrp_script check_HotDB Server_process {
```

```
script "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_p
rocess.sh process"
interval 5
fall 2
rise 1
weight -10
}

vrrp_script check_HotDB_Server_connect_state {
state
code
script "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_p
rocess.sh connect_master"
interval 5
fall 3
rise 1
timeout 5
weight -10
}
vrrp_instance VI_1 {
state BACKUP
interface eth1
virtual_router_id 89
nopreempt
}
```

```
priority 100

advert_int 1

authentication {

    auth_type PASS

    auth_pass 1111

}

track_script {

    check_HotDB Server_process

    check_HotDB Server_connect_state

}

#be careful in red hat

track_interface {

    eth1

}

virtual_ipaddress {

    192.168.200.140/24 dev eth1 label eth1:1

}

notify_master "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_process.sh master_notify_master"

notify_backup "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_process.sh master_notify_backup"

notify_fault "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_process.sh master_notify_backup"

}
```

Keepalived configuration information of standby compute node: 192.168.200.191:

```
! Configuration File for keepalived

global_defs {

    router_id HotDB Server-ha

}

vrrp_script check_HotDB Server_process {
    script "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_p
rocess.sh process"
    interval 5

    fall 2

    rise 1

    weight -10
}

vrrp_script check_HotDB Server_connect_state {
    state
    code

    script "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_p
rocess.sh connect_backup"
    interval 5

    fall 3

    rise 1

    timeout 5

    weight -10
}
```

```
}

vrrp_instance VI_1 {

state BACKUP

interface eth0

virtual_router_id 89

priority 95

advert_int 1

authentication {

auth_type PASS

auth_pass 1111

}

track_script {

check_HotDB_Server_process

check_HotDB_Server_connect_state

}

#be careful in red hat

track_interface {

eth0

}

virtual_ipaddress {

192.168.200.140/24 dev eth0 label eth0:1

}

notify_master "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_vip"
```

```

k_hotdb_process.sh backup_notify_master"
notify_backup "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_
k_hotdb_process.sh backup_notify_backup"
notify_fault "/bin/bash /usr/local/hotdb/hotdb-server/bin/check_hotdb_process.sh backup_notify_backup"
}

```

Note: Relevant configuration of master/standby keepalived could also be made referring to keepalived.conf.master and keepalived.conf.backup under compute node installation directory /conf. The red area shall be modified according to actual information, while the other areas shall be keep default setting for other configurations.

Description of customized modification contents:

- Script: Script path is the actual installation path of compute node, and the called master/standby script shall be configured according to the actual master/standby role
- Interface: the bound network interface card (NIC)
- Nopreempt: set whether to enable the Preempt mode or not. If this parameter is added, Preempt mode will not be enable; otherwise, Preempt mode will be enable. If the master parameter value is priority 100, while the backup parameter value is priority 95, then this parameter shall be set in master keepalived configuration script.
- Priority: the one with high-priority is the master
- virtual_ipaddress: bound vip of instance (vip shall be in the same network segment with the compute node ip)
- Label: give a virtual name to local NIC for binding virtual NIC IP, for example, bind the virtual NIC eth0:1 to the local NIC eth0
- Script: the script path judging whether the service is normal or not, is generally stored under /bin directory of HotDB Server, for example: /usr/local/hotdb/hotdb-server/bin/check_hotdb_process.sh, this script could check whether the

master/standby service process of HotDB Server exists or not, and whether the 3323 port and 3325 port of the master/standby HotDB Server are in normal status or not.

3. Start instruction

Since the HotDB Servers on the two servers are of master/standby relation, therefore, when starting the service, attention ought to be paid to the start sequence, and the standard start sequence is as follows:

Start the master (192.168.200.190) keepalived first, and then start the master compute node service **after ping VIP successfully**

Start master keepalived service

```
#service keepalived start
```

Then start the master compute node service after ping VIP successfully

```
#sh /usr/local/hotdb/hotdb-server/bin/hotdb_server start
```

Command “ip a” could be used to could view whether the current master keepalived VIP has been successfully bound or not

```
[root@hotdb2-4 keepalived]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: eth1: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN qlen 1000
    link/ether 00:1d:0f:14:8b:fa brd ff:ff:ff:ff:ff:ff
   inet 192.168.200.190/24 brd 192.168.200.255 scope global eth1
        inet 192.168.200.140/24 brd 192.168.200.140 scope global secondary eth1:1
            inetb fe80::21d:ffff%eth1:1/64 scope link
                valid_lft forever preferred_lft forever
[root@hotdb2-4 keepalived]#
```

After master compute node service starts, **wait 20s**, and then start the backup (192.168.200.191) keepalived, and after keepalived starts, **wait 10s**, and then start the standby compute node service

Start the backup keepalived service

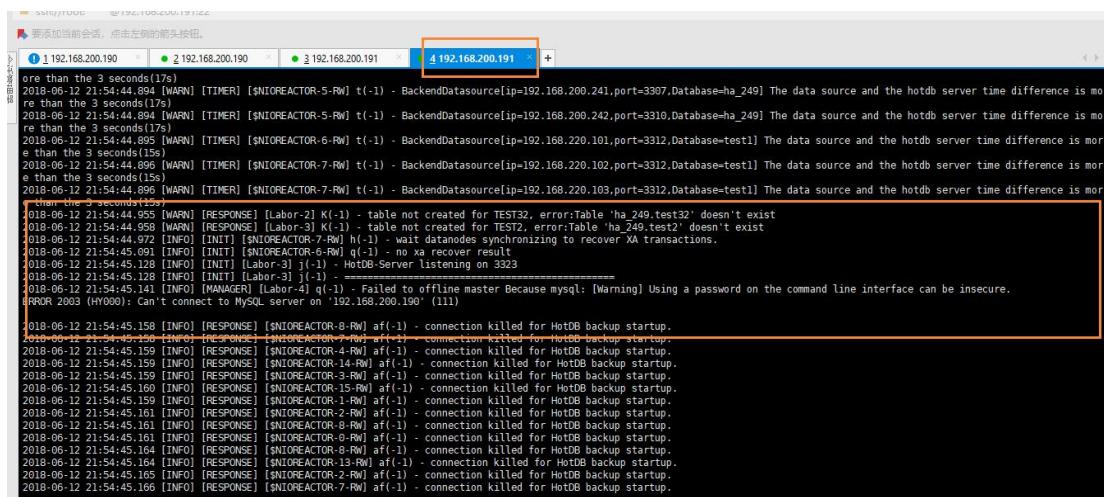
```
#service keepalived start
```

Start the standby compute node service

```
#sh /usr/local/hotdb/hotdb-server/bin/hotdb_server start
```

2.1.2.3. Description of high availability switch

In case of failure with the compute node service on the host 192.168.200.190 server, if the detection script (vrrp_scripts) detects that the master service port of the compute node is unaccesible or hacheck fails for more than 3 consecutive times, then the master keepalived priority will be adjusted automatically to 90 (weight=10), after the keepalived on the backup 192.168.200.191 server receives vrrp package inferior to its own priority (priority on 192.168.200.191 is 95), it will switch to master state, and preempt the vip (192.168.200.140), meanwhile, after entering master state, it will execute notify_master script, have access to backup server 3325 port, execute online command, and start and initialize standby compute node service port, and if compute node of 192.168.200.191 starts successfully, it will continue to provide service after successful master/standby switching. As shown in the following figure:

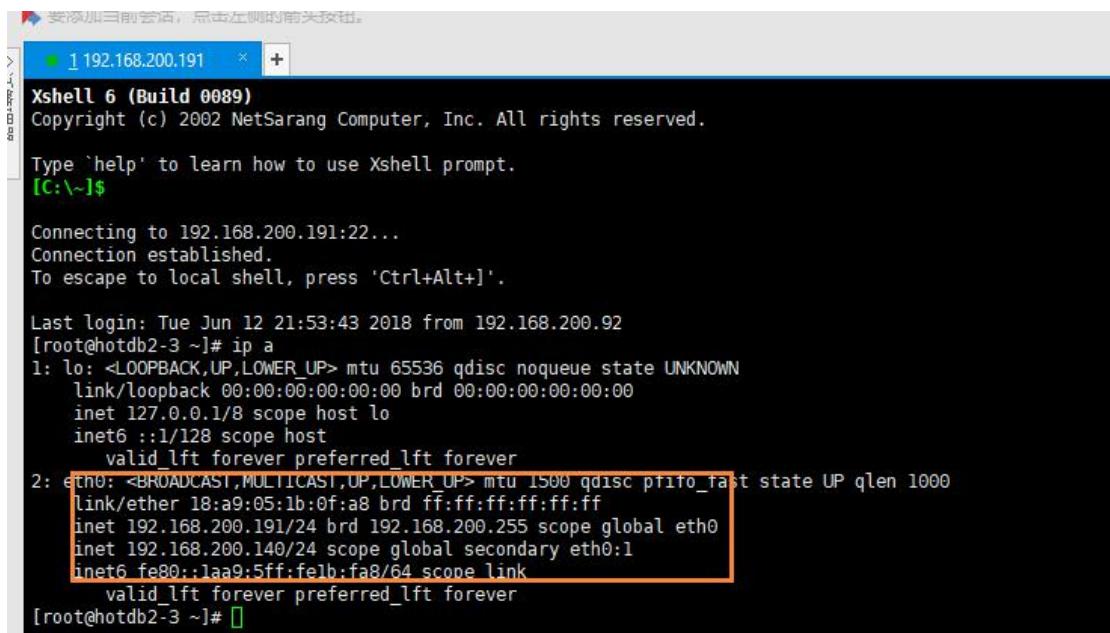


```
要添加当前会话，点击左侧的箭头按钮。
1 192.168.200.190 2 192.168.200.190 3 192.168.200.191 4 192.168.200.191 +
```

```
2018-06-12 21:54:44.894 [WARN] [TIMER] [$NIOREACTOR-5-RW] t(-1) - BackendDatasource[ip=192.168.200.241,port=3307,Database=ha_249] The data source and the hotdb server time difference is more than the 3 seconds(17s)
2018-06-12 21:54:44.894 [WARN] [TIMER] [$NIOREACTOR-5-RW] t(-1) - BackendDatasource[ip=192.168.200.242,port=3310,Database=ha_249] The data source and the hotdb server time difference is more than the 3 seconds(17s)
2018-06-12 21:54:44.894 [WARN] [TIMER] [$NIOREACTOR-6-RW] t(-1) - BackendDatasource[ip=192.168.220.101,port=3312,Database=test1] The data source and the hotdb server time difference is more than the 3 seconds(17s)
2018-06-12 21:54:44.895 [WARN] [TIMER] [$NIOREACTOR-7-RW] t(-1) - BackendDatasource[ip=192.168.220.102,port=3312,Database=test1] The data source and the hotdb server time difference is more than the 3 seconds(17s)
2018-06-12 21:54:44.896 [WARN] [TIMER] [$NIOREACTOR-7-RW] t(-1) - BackendDatasource[ip=192.168.220.103,port=3312,Database=test1] The data source and the hotdb server time difference is more than the 3 seconds(17s)
2018-06-12 21:54:44.955 [INFO] [RESPONSE] [Labor-2] K(-1) - table not created for TEST32, error:Table 'ha_249,test32' doesn't exist
2018-06-12 21:54:44.958 [INFO] [RESPONSE] [Labor-3] K(-1) - table not created for TEST2, error:Table 'ha_249,test2' doesn't exist
2018-06-12 21:54:44.972 [INFO] [INIT] [$NIOREACTOR-7-RW] h(-1) - wait datanodes synchronizing to recover XA transactions.
2018-06-12 21:54:45.091 [INFO] [INIT] [$NIOREACTOR-6-RW] q(-1) - no xa recover result
2018-06-12 21:54:45.128 [INFO] [INIT] [Labor-3] j(-1) - HotDB-Server listening on 3323
2018-06-12 21:54:45.128 [INFO] [INIT] [Labor-3] j(-1) - -----
2018-06-12 21:54:45.141 [INFO] [MANAGER] [Labor-4] q(-1) - Failed to offline master Because mysql: [Warning] Using a password on the command line interface can be insecure.
ERROR 2003 (HY000): Can't connect to MySQL server on '192.168.200.190' (111)

2018-06-12 21:54:45.158 [INFO] [RESPONSE] [$NIOREACTOR-8-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.158 [INFO] [RESPONSE] [$NIOREACTOR-7-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.159 [INFO] [RESPONSE] [$NIOREACTOR-4-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.159 [INFO] [RESPONSE] [$NIOREACTOR-14-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.159 [INFO] [RESPONSE] [$NIOREACTOR-3-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.160 [INFO] [RESPONSE] [$NIOREACTOR-15-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.161 [INFO] [RESPONSE] [$NIOREACTOR-1-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.161 [INFO] [RESPONSE] [$NIOREACTOR-2-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.161 [INFO] [RESPONSE] [$NIOREACTOR-8-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.161 [INFO] [RESPONSE] [$NIOREACTOR-0-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.164 [INFO] [RESPONSE] [$NIOREACTOR-8-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.164 [INFO] [RESPONSE] [$NIOREACTOR-13-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.165 [INFO] [RESPONSE] [$NIOREACTOR-2-RW] aft(-1) - connection killed for HotDB backup startup.
2018-06-12 21:54:45.166 [INFO] [RESPONSE] [$NIOREACTOR-7-RW] aft(-1) - connection killed for HotDB backup startup.
```

Keepalived VIP has already been on 192.168.200.191 server now



```

Xshell 6 (Build 0089)
Copyright (c) 2002 NetSarang Computer, Inc. All rights reserved.

Type 'help' to learn how to use Xshell prompt.
[C:\~]$ 

Connecting to 192.168.200.191:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+]'.

Last login: Tue Jun 12 21:53:43 2018 from 192.168.200.92
[root@hotdb2-3 ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP qlen 1000
    link/ether 18:a9:05:1b:0f:a8 brd ff:ff:ff:ff:ff:ff
    inet 192.168.200.191/24 brd 192.168.200.255 scope global eth0
        inet 192.168.200.140/24 scope global secondary eth0:1
            inet6 fe80::1aa9:5ff:fe1b:fa8/64 scope link
                valid_lft forever preferred_lft forever
[root@hotdb2-3 ~]# 

```

2.1.2.4. Description of high availability rebuild

Refer to the chapter of high availability rebuild in [Distributed Transactional Database HotDB Server \[Management Platform\] Function Manual](#) for details, and via this function the following could be implemented: in case of failover with the compute node on 192.168.200.190 server, and the master/standby relation could be recovered by manually triggering the compute node high availability rebuild function, and when there is failure with the compute node on 192.168.200.191 server again, it could be switched backed to 192.168.200.190 automatically.

2.1.3. NDB SQL Service

NDB SQL service could be used to assist the compute node in completing calcualtion of relatively complex SQL query statements under distributed environment. Refer to description in [Distributed Transactional Database Product HotDB Server - \[Standard\] Function Manual](#) for detailed introduction to NDB SQL service. At present, NDB SQL Service supports installation by clickOnce deployment and installation of script and

automatic deployment by “[Cluster Deployment](#)” and “[Single Component Deployment](#)” functions on management platform. Installation and deployment of NDB SQL service by script will be introduced as follow.

1. Notice before manual installation

- NDB SQL service matches to compute node service one by one, that is, if every compute node server needs NDB SQL service support, this service program shall be deployed.
- The version of the compute node corresponding to NDB SQL service must be V2.5.2 and above, otherwise, NDB SQL service is not supported.
- One-time follow deployment is recommended for NDB SQL service and compute node. If NDB SQL service needs to be added to the existing compute note, strict attention shall be paid to: parameter transfer problems of --install-ntpd, --ntpdate-server-ip, --ntpdate-server-host, which shall be consistent with the synchronization time configuration of the current deployed cluster.

2. Description of simultaneous deployment process of compute node and NDB SQL

Now, take master/standby cluster for example to illustrate installation of compute node and NDB SQL service by script, and the detailed steps are as follows:

- Log in each compute node server, enter clickOnce deployment resource bundle directory Install_Package to execute the installation command.

- Log in to the master compute node server, and enter clickOnce deployment default installation directory to execute:

```
sh hotdbinstall_v2.42.sh --install-hotdb-server=yes --hotdb-version=2.5 --install-ndbsql=yes --install-ntpd=yes --
ntpdate-server-host=182.92.12.11
```

- Log in to the standby compute node server, and enter clickOnce deployment default installation directory to execute:

```
sh hotdbinstall_v2.42.sh --install-hotdb-server=yes --hotdb-version=2.5 --install-ndbsql=yes --ntpdate-server-host=
```

IP address of master compute node server

3. Description of separate deployment procedure of NDB SQL

If compute node has been installed, but NDB SQL service needs to be installed additionally in later period, then it could be installed by separate deployment of NDB SQL via script, or by “[Single Component Deployment](#)” function on the management platform. This example describes additional deployment of NDB SQL service in later period taking single-node cluster for instance.

- Log in to compute node server, and enter rclickOnce deployment resource bundle directory `Install_Package` to execute installation command.

Example:

```
sh hotdbinstall_v2.xx.sh --install-n dbsql=yes - ntpdate-server-host=182.92.12.11
```

Notice:

- The time synchronization parameters used for installing time synchronization address of NDB SQL specified server shall be consistent with those used for previous installation of compute node

That is, whether `ntpdate-server-ip` or `ntpdate-server-host` is used shall be consistent for both times

- The time synchronization parameters used for installing time synchronization address shall be consistent with those used for previous installation of compute node. If there is NTP service in cluster, then the parameter value shall be IP address of NTP server.

4. Description of NDB SQL configuration

- After installing NDB SQL service, `server.xml` configuration shall be modified under installation `/conf` directory of corresponding compute node. `ndbSqlMode` in configuration file shall be modified as local. The details are as follow:

```
<property name="ndbSqlMode">none</property><!-- NDB mode. Disable(by default): none; NDB and HotDB in same machine: local-->

<property name="ndbSqlVersion">5.7.24</property><!-- Version of NDB -->

<property name="ndbVersion">7.5.12</property><!-- Engine verion of NDB -->

<property name="ndbSqlAddr">localhost:3329</property><!-- NDB SQL node address -->

<property name="ndbSqlUser">root</property><!-- NDB SQL node user nmae -->

<property name="ndbSqlPass">root</property><!-- NDB SQL node password -->

<property name="ndbSqlDataAddr">127.0.0.1:3327</property><!-- NDB Data node address -->
```

5. Description of NDB SQL start and stop

- NDB SQL service does not need to be separately started or stopped. It could be started simultaneously when starting compute node, and could also be stopped simultaneously when stopping compute node.

2.1.4. HotDB Listener component

HotDB Listener is a pluggable component of compute node. When enabled, it can solve the problem of performance linear expansion in the strong consistency mode of cluster. To use the Listener, the following requirements shall be met: the compute node is in multi-node cluster mode and XA is enabled, the Listener is successfully deployed on the data source server and the parameter enableListener is enabled. This chapter only describe how to manually deploy the Listener. For one-click deployment, please refer to the corresponding chapter of [automatic deployment](#).

HotDB Listener is compiled by JDK1.7.0_80, and the requirements for the operating system and Java environment are consistent with the HotDB Server. Currently, only IPV4 is supported.

2.1.4.1. Unzip installation package of one click deployment

Upload the installation package of one-click deployment auto_hotdbinstall_HotDB2.5.5_v1.0_20200422.tar.gz (2.5.5 is the version number, and different versions correspond to different numbers. Remember to replace the number synchronously.) to the data source server directory /usr/local/hotdb, and execute the following command:

```
#cd /usr/local/hotdb  
  
#tar -zxvf auto_hotdbinstall_HotDB2.5.5_v1.0_20200422.tar.gz
```

2.1.4.2. Installation of Listener

The installation package of one click deployment is built in Listener installation package. Install Listener in the directory /usr/local/hotdb by executing the following command:

```
#cd /usr/local/hotdb/Install_Package  
  
#tar -zxvf hotdb-listener-0.0.1-alpha-20200420-linux.tar.gz -C /usr/local/hotdb/
```

2.1.4.3. Configuration of Listener

Before starting, adjust the heap memory size of Listener according to the available memory space of the server.

```
#cd /usr/local/hotdb/hotdb-listener/bin  
  
#vi hotdb_listener
```

Set the heap memory size of row 24 to a reasonable range.

If the server memory is large, G1 algorithm and corresponding configuration can be used as required.

Then configure the Listener start port (this step can be omitted if there is no special requirement)

```
#cd /usr/local/hotdb/hotdb-listener/conf  
  
#vi config.properties
```

The default value of host is 0.0.0.0, which does not need to be modified; the default value of port is 3330, which is not recommended to be modified unless it is occupied.

2.1.4.4. Start Listener

Start the Listener by executing the following command:

```
#cd /usr/local/hotdb/hotdb-listener/bin  
  
#sh hotdb_listener start
```

If Listener is started successfully, the window will prompt “HotDB-Listener start successed.”

In addition to start, other parameters can be used as follows:

```
#sh hotdb_listener  
  
Usage: sh hotdb_listener [start|stop|restart]  
  
example:  
  
HotDB-Listener start      : sh hotdb_listener start  
  
HotDB-Listener stop       : sh hotdb_listener stop  
  
HotDB-Listener restart    : sh hotdb_listener restart
```

After startup, you can switch to the logs directory to view the log output, and view the related information of Listener.

```
#tailf listener.log
```

```
2020-05-25 12:09:54.089 [INFO] [INIT] [main] cn.hotpu.hotdb.ListenerServer(158) - Listener-Manager start
listening on host 0.0.0.0 port 3330
```

2.2. Automatic deployment

Automatic deployment is a function on management platform which supports automatic installation and deployment of compute node cluster in the interface. At present, V2.5.0 and later version of management platform have two automatic installation functions: “Cluster Deployment” and “Single Component Deployment”. “Cluster Deployment” is fit for one-time deployment of the whole set of compute node cluster from 0, while “Single Component Deployment” is fit for adding individual cluster component to deployed cluster.

2.2.1. Cluster deployment

Every cluster deployment task is conducted with a set of clusters as the unit, and a deployment shall at least include: compute node, configDB and keepalived (required by master/standby node mode), other components: Data Source, LVS (multi-node mode) and NTPD could be installed as required. It supports installation of “single-node, master/standby node and multiple node” cluster modes. The installed cluster will be automatically built high availability and automatic start according to configuration.

2.2.2.1. Description of terms

Please refer to *Distributed Transactional Database HotDB Server [Explanation of Terms] Function Manual* for relevant terms of cluster deployment

2.2.2.2. Function use instruction

- Cluster deployment only supports CentOS6\7 RHEL6\7, MySQL 5.6\5.7, HotDB-Server2.4, HotDB-Server2.5;
- The hard disk exceeding 2EB may have computation error;
- It does not support multiple compute nodes or multiple management platforms or multiple HotDB Backups installed on the same server;
- It's recommended adding clean operating system environment server;
- SSH information of server must be configured by the user with root privilege;
- The added server requires available yum source and iso image file of corresponding operating system version under the installation script directory;
- Installation Deployment package name starts with “auto_hotdbinstall” by default, and please don't change the deployment package name under the server arbitrarily;
- Storage route of the uploaded deployment package is /usr/local/hotdb by default of the program;
- MySQL supports installation of 5.6.41, 5.7.25/8.0.16 versions by default, and if requiring other versions, please substitute relevant installation package under the installation directory independently;
- Before deploying the cluster, the management platform shall confirm that there is cluster Installation Deployment package resource under any of the following directories of the management platform server. At the time of cluster deployment, resource bundle will be looked up from the following directories to be uploaded through /usr/local/hotdb route of the target server. (The lookup priority is subject to the following)

/opt

/opt/hotdb

/usr/local

/usr/local/hotdb

2.2.2.3. Deploy management platform

1. Upload deployment installation package to the server, and unzip to specified directory

```
#mkdir /usr/local/hotdb  
  
#tar -zvxf auto_hotdbinstall_HotDB2.*.tar.gz -C /usr/local/hotdb/
```

2. Execute the installation script to install management platform

```
#cd /usr/local/hotdb/Install_Package/  
  
#sh hotdbinstall_v*.sh --ntpdate-server-ip=182.92.12.11 --mysql-version=5.7 --hotdb-config-port=3316 --hotdb-version=2.5 --install-hotdb-server-management=yes
```

3. View installation log to acquire the installation progress

```
# tail -f /usr/local/hotdb/Install_Package/hotdbinstall.log
```

4. If the log prints the following mark, the installation is successful and of normal end

```
[INFO] hotdbinstall finished without error, but you should check if there is any warnings
```

5. Start management platform

```
# sh /usr/local/hotdb/hotdb-management/bin/hotdb_management start
```

6. Open management platform via browser

After successful start, open the browser to input:

After successful opening of the page via <http://server IP address:3324/page/index.html>, log in to the account to admin user interface. (Both admin username and password are admin|admin by default)

2.2.2.4. Description of cluster deployment function

Description: “Multiple-node” cluster deployment is taken for instance this time, to illustrate complete process and corresponding descriptions during cluster deployment.

Add cluster deployment task

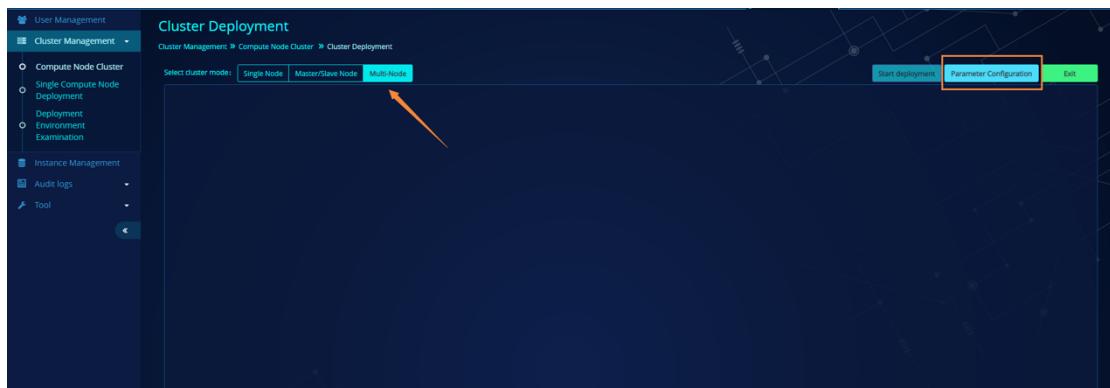
After the admin user logs in to management platform, enter “Cluster Management->Compute Node Cluster”, and click [Cluster Deployment] button to enter the page of Cluster Deployment function.



Cluster Config Info										Cluster Deployment Info				Cluster Operation	
	Group Name	Cluster Mode	Name	IP Address	Service Port	Management Port	Master/Slave Type	Compute Node	High Available Components	ConfigDB	NTPD Time Service	Data Source Instance	Deployment Environment Grade		
	ComputeNode		01	192.168.210.86	3323	3325	Cluster	Shutdown	Shutdown	192.168.210.89					
	ComputeNode	Multi-Node v.2.5.3	02	192.168.210.87	3323	3325	Cluster	Shutdown	Shutdown	192.168.210.90		Active	Active	Not Configured Examination	
	ComputeNode		03	192.168.210.88	3323	3325	Cluster	Shutdown	Shutdown						
	HotDB_Cluster01	Multi-Node v.2.5.3	HotDB_01	192.168.210.30	3323	3325	Cluster							13	
	HotDB_Cluster01	Multi-Node v.2.5.3	HotDB_02	192.168.210.31	3323	3325	Cluster								
	HotDB_Cluster01	Multi-Node v.2.5.3	HotDB_03	192.168.210.32	3323	3325	Cluster								

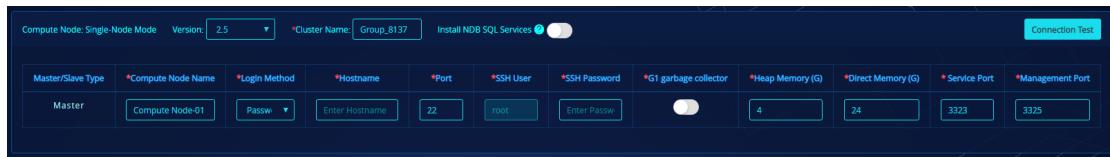
Select cluster mode of deployment

Cluster is divided into three modes: single node, master/standby node and multiple node, and after selecting the cluster mode, click [Parameter Configuration] button to enter the page of Cluster Deployment Parameter Configuration.



Description of cluster modes:

- Single-node: single-node refers to the cluster mode that there is only one compute node in the whole cluster. Installation of Keepalived or LVS and other high availability components is unnecessary.



The screenshot shows the 'Compute Node: Single-Node Mode' configuration page. It includes fields for 'Compute Node Name' (Group_8137), 'Login Method' (Passwd), 'Hostname' (Enter Hostname), 'Port' (22), 'SSH User' (root), 'SSH Password' (Enter Passwd), 'G1 garbage collector' (disabled), 'Heap Memory (G)' (4), 'Direct Memory (G)' (24), 'Service Port' (3323), and 'Management Port' (3325). A 'Connection Test' button is at the top right.

- Master/standby node: master/standby mode is also known as HA mode, namely the cluster mode making high availability rebuild via Keepalived component. There are master and standby compute nodes in the cluster.



The screenshot shows the 'Compute Node: Master/Slave Node Mode' configuration page. It includes fields for 'Compute Node Name' (Group_4349), 'Login Method' (Passwd), 'Hostname' (Enter Hostname), 'Port' (22), 'SSH User' (root), 'SSH Password' (Enter Password), 'G1 garbage collector' (disabled), 'Heap Memory (G)' (4), 'Direct Memory (G)' (24), 'Service Port' (3323), and 'Management Port' (3325). The 'Master' row has 'Master' selected in the 'Master/Slave Type' column. The 'Slave' row has 'Slave' selected in the 'Master/Slave Type' column. A 'Connection Test' button is at the top right.

Below this, there is a 'ConfigDB' section with 'Version' (5.6) and 'Create High privilege Users' (disabled).

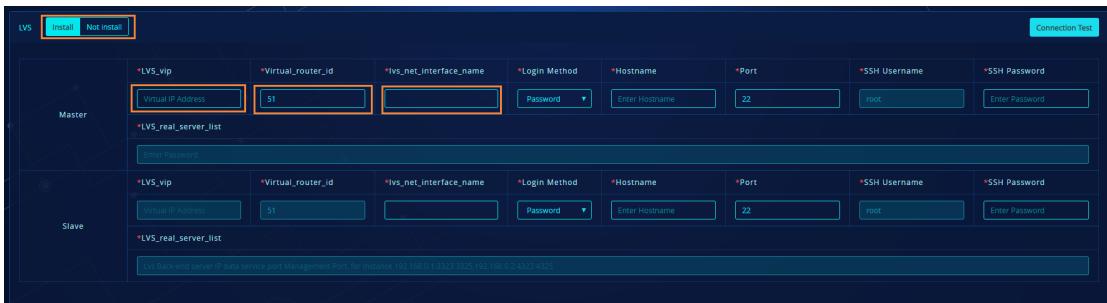
The 'Keepalived' section shows configuration for two servers:

	virtual_ipaddress (②)	virtual_router_id (③)	keepalived_net_interface_name (④)
Master	<input type="text"/>	151	<input type="text"/>
Slave	<input type="text"/>	151	<input type="text"/>

- ① Master/standby node mode cluster requires filling in configuration information of 2 servers.

- ② Virtual_ipaddress of Keepalived (hereinafter referred to as VIP) is required to be the address not occupied by server or other applications and on the same network segment with the compute node server. The format is VIP+Subnet Mask length, for example: 192.168.200.120/24.
- ③ The virtual_router_id value could be selected from [1-255] independently, but this value is required to be unique in the network segment used by the cluster, that is, it shall not conflict with the value selected for other application services.
- ④ Gateway device name of master/standby Keepalived server is the NIC device name of Keepalived server, and the name must be accurately filled in, and the format is NIC name + :1 for example: “eth0:1”. (gateway device name could be viewed via “ip a” command)
- Multi-node: multi-node mode is also known as load-balancing, which is an architecture mode controlling distribution of traffic to multiple compute nodes in the cluster via LVS component or other load-balancing components. There shall be no less than 3 or no more than 9 compute nodes in the multi-node mode.





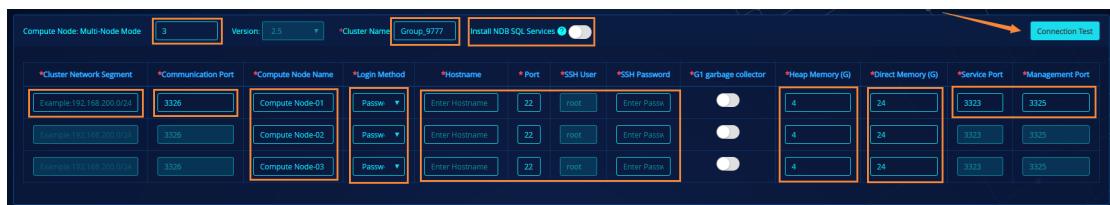
- ① In multi-node mode, the number of compute nodes is 3 by default, and the version of compute node must be 2.5.
- ② The cluster network segment is the network segment of the server where the compute node is installed, and the format is: network segment+Subnet Mask length, for example: 192.168.200.0/24.

- ③ Communication port is the port used by various compute nodes in the cluster for communication, and it is 3326 by default. Modification is not recommended without special requirements.
- ④ LVS is a component realizing load balance in multi-node mode, and it could also close [Install] to select other load-balancing methods to substitute LVS.
- ⑤ LVS_vip is the virtual IP address configured in LVS component (hereinafter referred to as VIP), and it's required to be the address not occupied by server or other applications and on the same network segment with compute node server. The format is VIP+Subnet Mask length, for example: 192.168.200.120/24.
- ⑥ virtual_router_id value could be selected from [1-255] independently, but this value is required to be unique in the network segment used by the cluster, that is, it shall not conflict with the value selected for other application services.
- ⑦ lvs_net_interface_name is the NIC name of LVS component server, and the name must be accurately filled in, and the format is NIC name + :2 for example: “eth0:2”. (gateway device name could be viewed via “ip a” command).

Configuration of cluster deployment parameters

1) Compute node parameters

Parameter configuration of compute nodes will be introduced with compute node cluster mode as multi-node for instance.



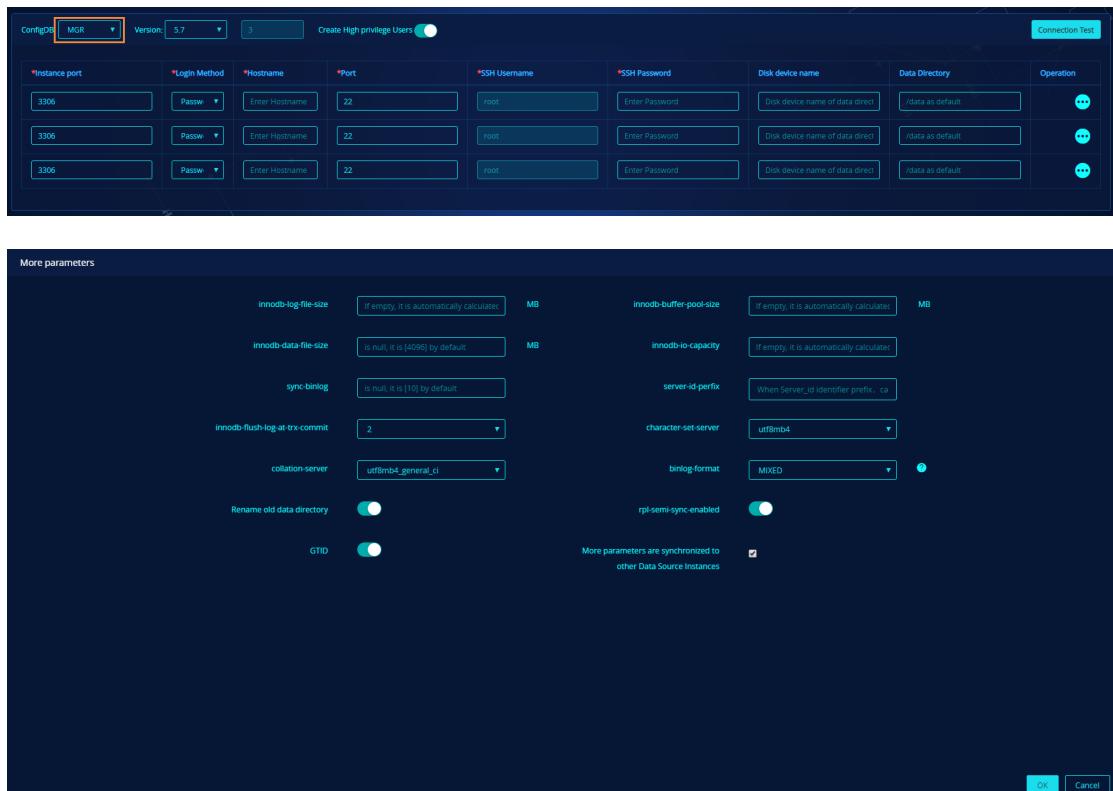
Cluster Network Segment	Communication Port	Compute Node Name	Login Method	Hostname	Port	SSH User	SSH Password	G1 garbage collector	Heap Memory (G)	Direct Memory (G)	Service Port	Management Port
Example:192.168.200.0/24	3326	Compute Node-01	Passw ▾	Enter Hostname	22	root	Enter Passw	<input checked="" type="checkbox"/>	4	24	3323	3325
Example:192.168.200.0/24	3326	Compute Node-02	Passw ▾	Enter Hostname	22	root	Enter Passw	<input checked="" type="checkbox"/>	4	24	3323	3325
Example:192.168.200.0/24	3326	Compute Node-03	Passw ▾	Enter Hostname	22	root	Enter Passw	<input checked="" type="checkbox"/>	4	24	3323	3325

- ① There shall be three compute nodes by default, and there shall be no less than three or no more than seven when setting.
- ② Cluster name will be generated automatically, and the format is: Group+four-digit random number, which could be modified as the case may be.

- ③ Whether NDB SQL service needs to be installed or not could be viewed as the case may be, if yes, it's required that the version of compute node must be greater than or equal to V2.5.2.
- ④ Cluster network segment is the network segment scope of the server where the compute node is, and the format is: network segment+Subnet Mask length, for example: 192.168.200.0/24
- ⑤ Communication port is the port used by various compute nodes in the cluster for communication, and it is 3326 by default. Modification is not recommended without special requirements.
- ⑥ Compute node name will be generated automatically, and the format is: compute node+serial No., which could be modified as the case may be.
- ⑦ The login mode is the connecting mode of management platform connecting to the deployment target server; login by “password” shall be used by default. And if using “Password-free” mode, it's required that there shall be password-free channel between the management platform server and the target deployment server, and the specific implementation mode shall be referred to “[Description of implementing password-free login](#)”.
- ⑧ When the “Login Mode” is “password”, the SSH information of the target server to be connected needing to be input shall include: SSH user, SSH password. The port number is 22 by default, which shall not be modified without special requirement.
- ⑨ Heap memory is 4G by default, when the setup is bigger than 8G, it will be prompted to open “G1 garbage collector”. Input range of the parameter is [1-64] G.
- ⑩ Direct memory is 24G by default, the input range of parameters is [1-64] G.
- ⑪ Service port and management port are “3323, 3325” by default, which could be used directly without special requirement. In case of successful modification and installation, corresponding parameters of server.xml configuration file of compute node will also be modified synchronously.

- ⑫ Whether the target server is normally connected or not could be tested or whether the SSH information input is available or not could be judged by clicking [Test Connection].

2) ConfigDB parameters



*Instance port	*Login Method	*Hostname	*Port	*SSH Username	*SSH Password	Disk device name	Data Directory	Operation
3306	Passwd	Enter Hostname	22	root	Enter Password	Disk device name of data direct	/data as default	...
3306	Passwd	Enter Hostname	22	root	Enter Password	Disk device name of data direct	/data as default	...
3306	Passwd	Enter Hostname	22	root	Enter Password	Disk device name of data direct	/data as default	...

More parameters

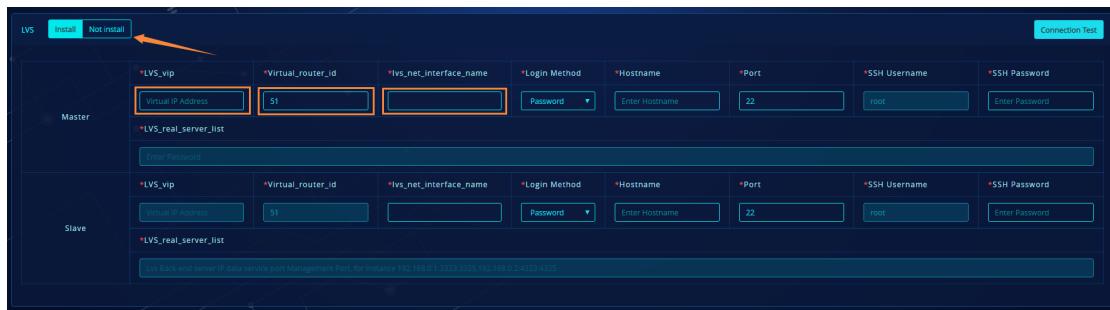
innodb-log-file-size: If empty, it is automatically calculated MB
 innodb-buffer-pool-size: If empty, it is automatically calculated MB
 innodb-data-file-size: If null, it is [4096] by default MB
 innodb-io-capacity: If empty, it is automatically calculated
 sync-binlog: Is null, it is [10] by default
 server-id-prefix: When Server_id identifier prefix... ca
 innodb-flush-log-at-trx-commit: 2
 character-set-server: utf8mb4
 collation-server: utf8mb4_general_ci
 binlog-format: MIXED
 Rename old data directory:
 GTID:
 rpl-semi-sync-enabled:
 More parameters are synchronized to other Data Source Instances:

- ① Selectable modes of the installed configDB instance are: single database, standby master and MGR, and MGR mode is taken for instance.
- ② configDB version will change due to the mode, and the version must be 5.7 if MGR mode is selected, and MySQL instance version of 5.6 or 5.7 could be selected if other modes are selected.
- ③ When MGR mode is selected, there shall be three editable instances under MGR mode by default, which shall be no less than three or no more than nine when editing. There is no quantitative limitation if other modes are selected.
- ④ Create high-privilege user switch, and the switch is open by default, that is, after successful installation of configDB MySQL instance, there will generate a

“hotdb_root” account by default, and such account owns all privileges of MySQL instance.

- ⑤ The instance port number is 3306 by default, which could be modified independently as the case may be.
- ⑥ The parameters “disk device name” and “data directory” are optional, and if they are null, the program will assign a null value for “disk device name” and the default value “/data” for “data directory” automatically. As for detailed description of the parameters, please refer to “[Description of cluster deployment script parameters](#)”.
- ⑦ [More Parameters] could set more optional parameters for the current deployed MySQL instance, and when the input box of the parameter is null, the Installation Script will make self-computation and processing and assign default value, and modification is not recommended without special requirement. If needing to make the modified parameters applicable to other deployed configDB instance, the option “Synchronize more parameters to other configDB instances” shall be checked.

3) LVS parameters

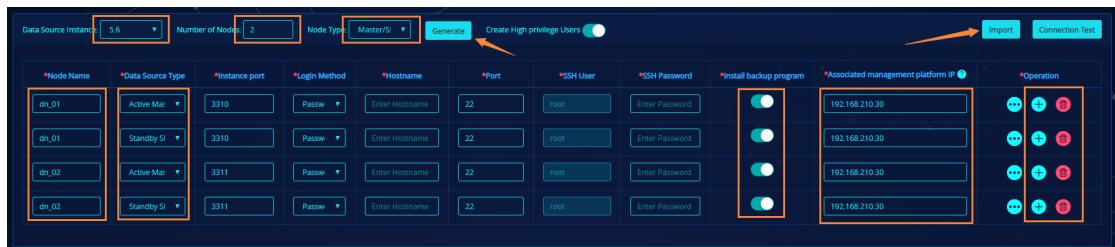


The screenshot shows the 'LVS' tab of the installation script. It has two sections: 'Master' and 'Slave'. Each section contains fields for 'LVS_vip' (Virtual IP Address), 'Virtual_router_id' (51), 'lvs_net_interface_name' (empty), 'Login Method' (Password dropdown), 'Hostname' (Enter Hostname), 'Port' (22), 'SSH Username' (root), and 'SSH Password' (Enter Password). Below each section is a 'LVS_real_server_list' input field. A note at the bottom states: 'Leave this field empty or enter service port management port, for instance: 192.168.100.120:3306'.

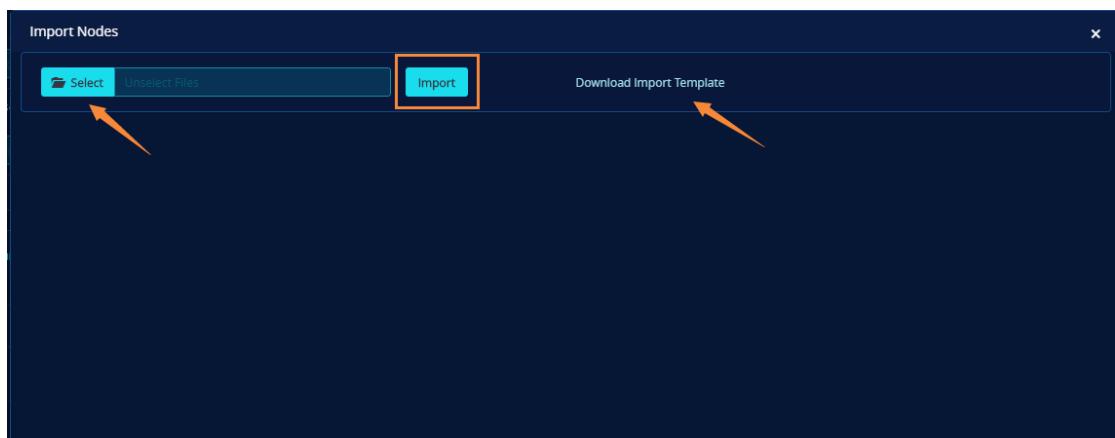
- ① Cluster deployment does not support installation of LVS related components, and if Not Install is selected, the LVS configuration parameters do not need to be filled in
- ② The IP filled in for “LVS_vip” is required to be the one not occupied by server or other application and on the same network segment with the compute node server. The format is VIP+Subnet Mask length, for example: 192.168.200.120/24
- ③ “virtual_router_id value could be selected from [1-255] independently, but this value is required to be unique in the network segment used by the cluster, that is, it shall not conflict with the value selected for other application services.

- ④ Master/standby “lvs_net_interface_name” is the gateway device name of the LVS server, and such name must be consistent with the one displayed on the real server (it could be viewed via ip a command), and the format is: gateway device name + “:2”, for example: “eth0:2”.

4) Data source parameters

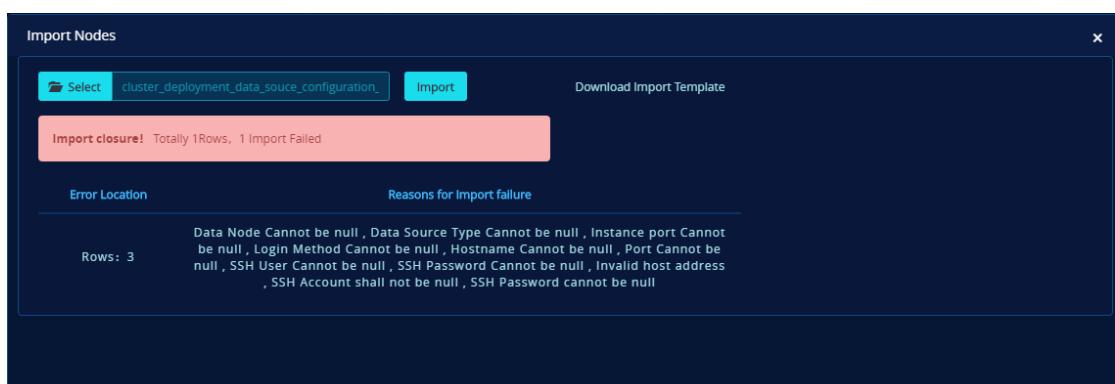


*Node Name	*Data Source Type	*Instance port	*Login Method	*Hostname	*Port	*SSH User	*SSH Password	*Install backup program	*Associated management platform IP	*Operation
dn_01	Active Mgr	3310	Passw.	Enter Hostname	22	root	Enter Password	<input checked="" type="checkbox"/>	192.168.210.30	
dn_01	Standby Sl	3310	Passw.	Enter Hostname	22	root	Enter Password	<input checked="" type="checkbox"/>	192.168.210.30	
dn_02	Active Mgr	3311	Passw.	Enter Hostname	22	root	Enter Password	<input checked="" type="checkbox"/>	192.168.210.30	
dn_02	Standby Sl	3311	Passw.	Enter Hostname	22	root	Enter Password	<input checked="" type="checkbox"/>	192.168.210.30	



Import Nodes

Select Unselect Files Import Download Import Template



Import closure! Totally 1Rows, 1 Import Failed

Error Location Reasons for Import failure

Rows: 3

Data Node Cannot be null , Data Source Type Cannot be null , Instance port Cannot be null , Login Method Cannot be null , Hostname Cannot be null , Port Cannot be null , SSH User Cannot be null , SSH Password Cannot be null , Invalid host address , SSH Account shall not be null , SSH Password cannot be null



Red means requires, while green means optional														
Data Node	Data Source Type	Instance port	Login Method	Hostname	Port	SSH User	SSH Password	MySQL Data Directory	Disk Device Name	Install Backup Program	Associated Management IP	Rename old data director	GTID	server-id-perf
dn01	MGR	3310	Password	192.168.210.63	22	root	123456			Yes		Yes		
dn01	MGR	3310	Password	192.168.210.64	22	root	123456							
dn01	MGR	3310	Password	192.168.210.63	22	root	123456							

- ① Data Source shall select the version “5.6, 5.7”, which is 5.7 by default.

- ② Number of nodes is the number of data nodes in the cluster, which cannot exceed 128 when setting.
- ③ Node type is the replication relation type of the associated data sources under Data Node, which includes: single database, master/slave, standby master and MGR.
- ④ Data Source configuration information could be generated according to the optional parameter selected by clicking [Generate] button.
- ⑤ As for “Create High-Privilege User”, please refer to description about this in configDB.
- ⑥ “Node Name” is the Data Node Name, which is automatically generated according to “Number of Nodes”, and could be modified by the user independently.
- ⑦ “Data Source Type” is generated according to the “Node Type” selected by default. for example: if the “Node Type” is “Master/Slave”, then there will generate a “Active Master” and “Standby Slave” type data source records respectively under each Data Node.
- ⑧ The “Install Listener” switch is ON by default, that is, install the HotDB Listener component on the server where the data source is located. The Listener can be installed to solve the performance linear expansion problem of the compute node cluster mode. If the user does not use Listener temporarily, it can be OFF manually.
- ⑨ “Listener port” is the start port of Listener. The default value is 3330, which can be modified manually. To deploy a Listener on a data source server, you need to configure an unoccupied port as the Listener port. Only one Listener can be deployed through cluster deployment on a data source server, that is, the same host name can only be configured with the same Listener port. If "Install Listener" is turned off, the "Listener port" will be grayed and cannot be edited.
- ⑩ “Listener service port” refers to the port where the compute node connects to the data source through the Listener. The default value is 4001. If a Listener needs to listen to multiple data sources, it needs to fill in different service ports for them. If "Install Listener" is turned off, the "Listener service port" will be grayed and cannot be edited.

- ⑪ “Install HotDB Backup” switch is open by default, that is, install HotDB Backup on the server where the Data Source is.
- ⑫ “Associated Management Platform IP” shall be filled in the address of the current management platform executing the cluster deployment task. This address is the management platform address which needs to be specified when starting HotDB Backup and also the service target of HotDB Backup.
- ⑬ A line of data source configuration records could be added or deleted by clicking “Add” or “Delete” in operation.
- ⑭ If there are too many Data Sources, “Import” mode may be considered for making configuration. Before import, download the template first, and then fill in the configuration information as instructed on the template, and then import into the management platform upon completion. In case of fill-in error, the program will display import failure and detailed failure information.

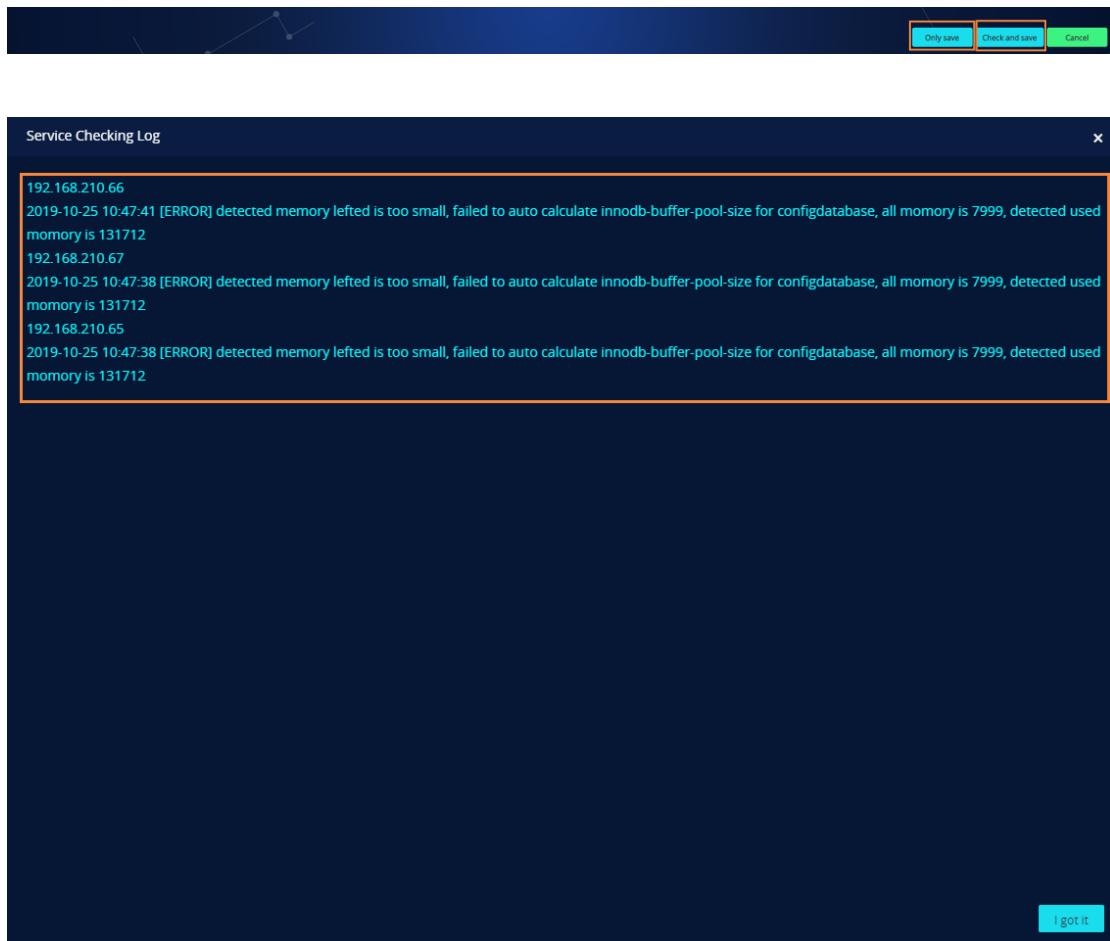
5) Time synchronization parameter setting



- ① Time synchronization is mainly used for designating NTP time service address for all servers of the cluster, so as to ensure time consistency of the servers in the cluster.
- ② NTP service program is installed on the server of the master compute node or the multiple nodes by default. If there has been available NTP service in the cluster already, the installation could be cancelled.
- ③ The other server time synchronization addresses in the cluster refer to the compute node server address installed with NTP server by default. If the compute node has no NTP server installed, then the time synchronization address of the other servers shall be consistent with that of the compute node server.
- ④ Tips: in the actual scenario, in addition to the clock synchronization configuration of software, you also need to pay attention to whether the hardware clock is synchronized. You can use hwclock to check (generally, there is a greater possibility

of difference in the virtual machine environment).

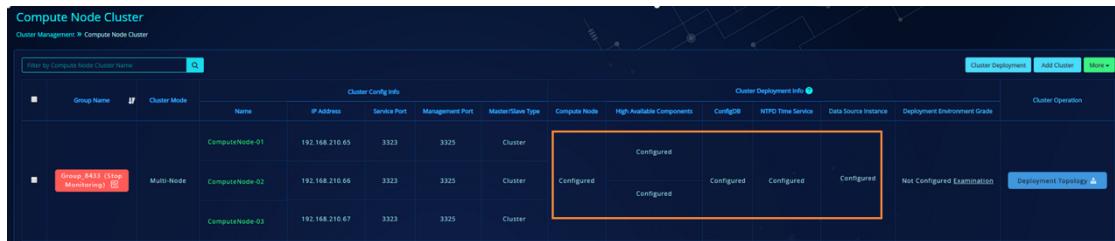
Parameter checking and saving



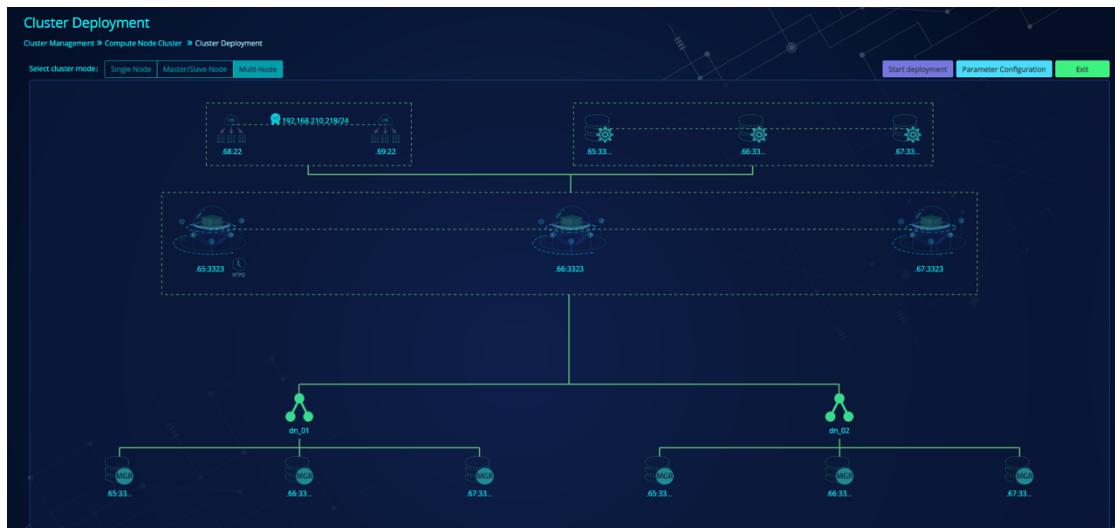
- ① Save Only: Click [Save Only] button, the program will not verify legality and integrity of the configuration parameter input, and it only checks whether the required items have been computed or not.
- ② Check and Save: click [Check and Save] button, the program will check the legality and integrity of the configuration parameters, and send the installation deployment package to the target server to verify whether it meets hardware requirement for cluster deployment, and if not, there will be pop-up prompt. **All clusters could be installed only after passing the [Check and Save] before deployment starts.**
- ③ If the cluster configuration parameter fails the test, modification shall be made

correspondingly according to the error condition, and then checking shall be made again.

- ④ If test fails due to that the server hardware configuration does not meet requirement, it's recommended saving the configuration parameters via [Save Only] button first, and then adjusting hardware configuration of the target server or replacing the target server as prompted, and then make checking again.

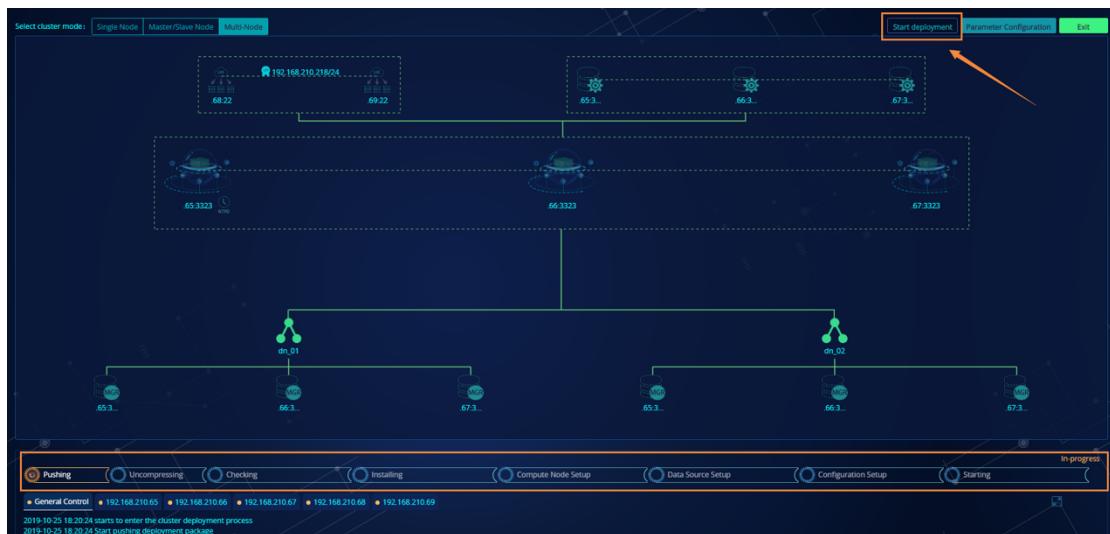


- ⑤ The saved but uninstalled cluster has monitoring not enabled when displayed on “Cluster Management” page, and the information of various cluster deployment information columns has the word “Configured” when displayed.



- ⑥ The saved but uninstalled cluster is displayed as the above figure after entering via “Deployment Topology” button. The dashed icons refer to the configured but uninstalled components.

Start deployment



- ① Click [Start Deployment] to enter the Installation Process, and for the cluster which fails the checking, when clicking [Start Deployment], it will be prompted that deployment is not allowed.
- ② View the current deployment status via the deployment progress bar.
- ③ Deployment log will be made real-time output to the console, and the master console could view deployment condition of all servers. Specifically speaking, every server console could view script execution log information on deployment of corresponding server separately.

- ④ Full-screen view is available by clicking the Zoom In button on the top right corner.
- ⑤ After completing the installation, the word “Cluster deployment succeeded” could be displayed on the master console.

Deployment completed



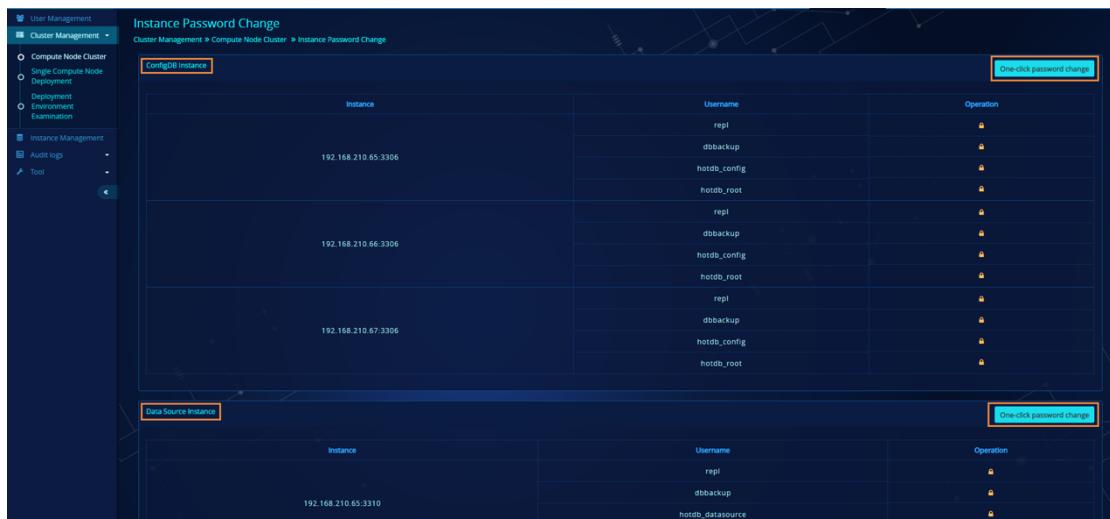

- ① For the successfully deployed cluster, monitoring will be opened automatically on “Cluster Management” page, and running state information of the components will be displayed in the “Cluster Deployment Information” columns.
- ② Click [Deployment Topology] button to enter the deployment topology page, it could be seen that all icons on the topology have become full line ones.

Instance password modification

For the deployed cluster, both the installed configDB and the Data Source instances could generate some accounts automatically. The details are as follow: configDB

instance generates hotdb_config, dbbackup, repl, hotdb_root (depends on whether opening the switch of Creating high-privilege account or not); Data Source instance generates hotdb_datasource, dbbackup, repl and hotdb_root (depends on whether opening the Creating high-privilege account or not).

Since the password and account No. of the generated account are consistent, therefore, it's recommended **modifying the instance password immediately after completing the deployment**, in order to improve safety of the cluster.

ConfigDB Instance	Instance	Username	Operation
192.168.210.65:3306	repl	<input type="button" value="Change"/>	
	dbbackup	<input type="button" value="Change"/>	
	hotdb_config	<input type="button" value="Change"/>	
	hotdb_root	<input type="button" value="Change"/>	
192.168.210.66:3306	repl	<input type="button" value="Change"/>	
	dbbackup	<input type="button" value="Change"/>	
	hotdb_config	<input type="button" value="Change"/>	
192.168.210.67:3306	repl	<input type="button" value="Change"/>	
	dbbackup	<input type="button" value="Change"/>	
	hotdb_config	<input type="button" value="Change"/>	
	hotdb_root	<input type="button" value="Change"/>	

Data Source Instance	Instance	Username	Operation
192.168.210.65:3310	repl	<input type="button" value="Change"/>	
	dbbackup	<input type="button" value="Change"/>	
	hotdb_datasource	<input type="button" value="Change"/>	

- ① Modification of instance password is divided into two parts: modification of configDB instance password, and modification of Data Source instance password.
- ② You can modify user passwords one by one by clicking the [Password Modification]

button in the Action Bar or in batches by clicking [clickOnce Modification of Password] button.

- ③ Modification of user passwords in batches is divided and displayed by user roles, for example, if modifying the password of repl account in configDB instance, then the repl account passwords in all instances of configDB will be modified synchronously. So does the Data Source.
- ④ For instances with replication relation, modification of one user password will cause modification of passwords of all instances with replication relation. For example, for Data Source instances with MGR relation (192.168.210.81:3311, 192.168.210.82:3311, 192.168.210.83:3311), if modifying the hotdb_root user password on 192.168.210.81:3311 instance to admin, the program will modify the hotdb_root user passwords of the other two instances to admin.
- ⑤ After submitting password modification, the instance password modification page will make page loading, and please don't refresh the page or conduct other operations at this time.

2.2.2. Single Component Deployment

Single Component Deployment function could continue to add new components to the existing cluster for the user. In addition, it could also deploy a set of new clusters from zero, because it could also provide High Availability Rebuild, clickOnce Start and other functions in addition to installation function, but relative to “[Cluster Deployment](#)” function, “Single Component Deployment” is more suitable for deploying single component.

2.2.2.1. Description of terms

Please refer to [Distributed Transactional Database HotDB Server \[Explanation of Terms\] Function Manual](#) for relevant terms of Single Component Deployment

2.2.2.2. Function use instruction

Single Component Deployment Function use instruction is consistent with “[Cluster Deployment Function Use Instruction](#)”, description of which could be referred to.

2.2.2.3. Deploy management platform

Single Component Deployment is a function in management platform, and before use, management platform shall be installed first. Please refer to “[Instruction of Deployment of Cluster Deployment Function Management Platform](#)” for instruction on installation steps.

2.2.2.4. Single Component Deployment

Description: Deployment of a master/standby mode cluster will be illustrated via “Single Component Deployment” this time. Keepalived virtual address (VIP) uses “192.168.200.112”; master/standby compute node server is installed on “192.168.200.45 and 192.168.200.46” servers respectively. Meanwhile, 4 Data Source MySQL instances are installed respectively on servers “192.168.200.47 and 192.168.200.48”.

Add deployment task

After logging in to the management platform via admin user, select “Compute Node Cluster ->Single Component Deployment” and click [Add Deployment Task]

Single Component Deployment

Cluster Management ➤ Single Component Deployment

Hostname	Server Role	SSH Connection	Install Software	Quantity	Installation Status	Startup Status	Operation			
192.168.210.55	Compute Node Server	Expired	NTPD Service	1	Not install	Not Start				
192.168.210.223	Data Source Server	Expired								
192.168.220.102	Compute Node Server	Expired	NTPD Service	1	Installation succeeded	Not Start				
192.168.220.103	Compute Node Server	Expired	NTPD Service	1	Installation succeeded	Not Start				

Deploy compute node and configDB

Server Information

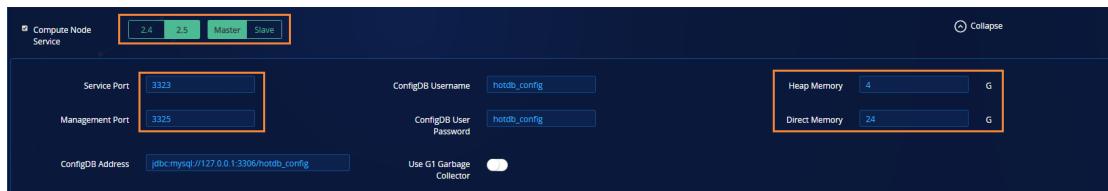
Server Role	Compute Node	Enter relevant connection information
Protocol	ssh	
Login Method	Password	
Hostname	192.168.200.45	
Port	22	
Username	root	
Password	*****	
Connection Test		

Software Installation Information and Configuration Information

<input checked="" type="checkbox"/> Compute Node Service	2.4	2.5	Master	Slave	<input type="radio"/> Expand more Configurations
<input checked="" type="checkbox"/> Keepalived					<input type="radio"/> Collapse
virtual_ipaddress: Virtual IP Address+Mask Length. For example: 192.168.200.140/24 virtual_router_id: 151 keepalived.net_interface.name:					
<input checked="" type="checkbox"/> Data Source MySQL Instance	5.6	5.7	8.0	Instance Number: 4	<input type="radio"/> Expand more Configurations
<input checked="" type="checkbox"/> ConfigDB MySQL Instance	5.6	5.7	8.0		<input type="radio"/> Expand more Configurations
<input checked="" type="checkbox"/> NTPD Service	2.4	2.5			
<input checked="" type="checkbox"/> Compute Node Management Platform					
<input checked="" type="checkbox"/> Data Source Backup Program					
<input checked="" type="checkbox"/> NDB SQL Service					
Server Time Synchronization Address:					<input type="radio"/> Save Information <input type="radio"/> Start installation

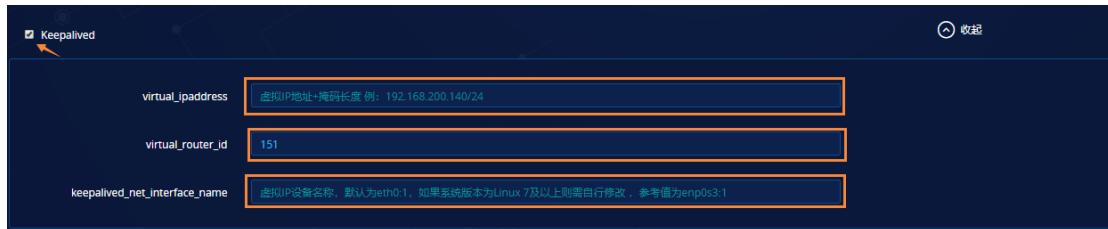
- ① When the server role is selected “Compute Node”, the “software installation information and configuration information” will check “Compute node service, Keepalived, configDB MySQL Instance and NTPD Server” automatically by default. This role is selected for guiding installation only, and has no influence on actual installation, and the user could also select other components according to actual conditions.

- ② The target deployment server could be logged in via “Password and Password-free” modes, if Password-free mode is used, password-free channel between the servers shall be manually established in advance, referring to “[Description of implementing password-free login](#)” for details. If “Password” mode is used, SSH connection username and password shall be input.
- ③ By clicking [Test Connection], whether the management platform server and the target deployment server could be of normal connection could be tested.
- ④ When logging in by password mode, in order to gaurantee SSH information safety, the management platform will save it for 24 h only, after that, in case of needing reconnection to the target server, click [Edit] for re-saving.

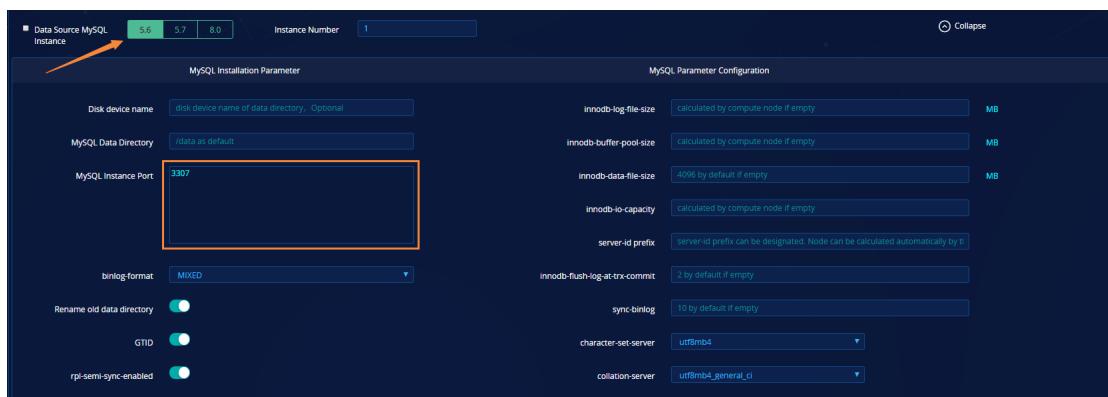


- ① Available versions for compute node are “2.4 and 2.5”; 2.4 represents the compute node installed with 2.4.X version, and the specific version No. shall be subjected to that provided in the installation package. The user could select according to actual condition.
- ② Master/standby selection of compute node shall be made according to actual condition of the current planning. In the master/standby mode, there needs to be a master compute node service and a standby compute node service.
- ③ The service port and management port are “3323, 3325” by default, and the default value could be used directly without special requirements.
- ④ If compute node and configDB are installed on the same server, the configDB related information could use the default value directly, but the configDB address IP shall be filled in actual value; if the compute node and configDB are on different servers, then the configDB information shall be modified according to actual condition.
- ⑤ The heap memory and direct memory are “4G and 24G” by default, and the user could also adjust according to actual condition, but the input scope shall not exceed

[1-64] G. When the heap memory exceeds 8G, it's recommended opening the G1 Garbage Collector.



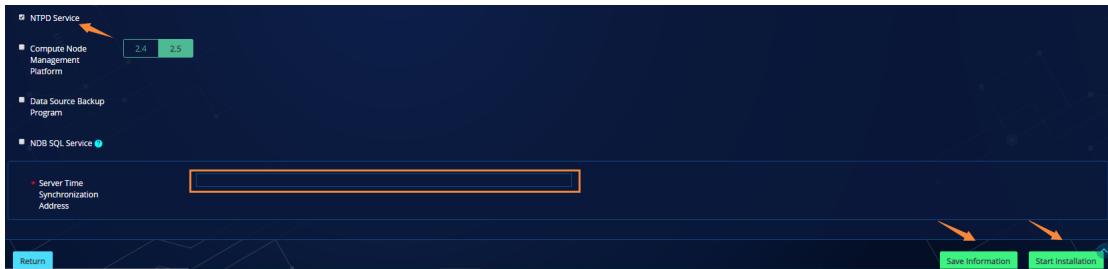
- ① For master/standby mode cluster, Keepalived component must be installed on compute node server, otherwise, compute node cannot build high availability.
- ② Keepalived's virtual_ip address (hereinafter referred to as VIP) is required to be the one not occupied by intranet server or other applications and on the same network segment with the compute node server. The format is VIP+Subnet Mask length, for example: 192.168.200.120/24. In this place, we shall fill in the VIP address “192.168.200.112/24” planned previously.
- ③ virtual_router_id value could be selected from [1-255] independently, but this value is required to be unique in the network segment used by the cluster, that is, it shall not conflict with the value selected for other application services.
- ④ keepalived_net_interface_name is the NIC name of the Keepalived server; the name must be accurately filled in, and the format is NIC name +:1, for example: “eth0:1”. (gateway device name could be viewed via “ip a” command).



- ① configDB MySQL instance and the compute node could be installed either on the same server or on separate servers. They are installed on the same server by default.
- ② The version is the version No. of configDB MySQL instance, which could be “5.6”

or 5.7".

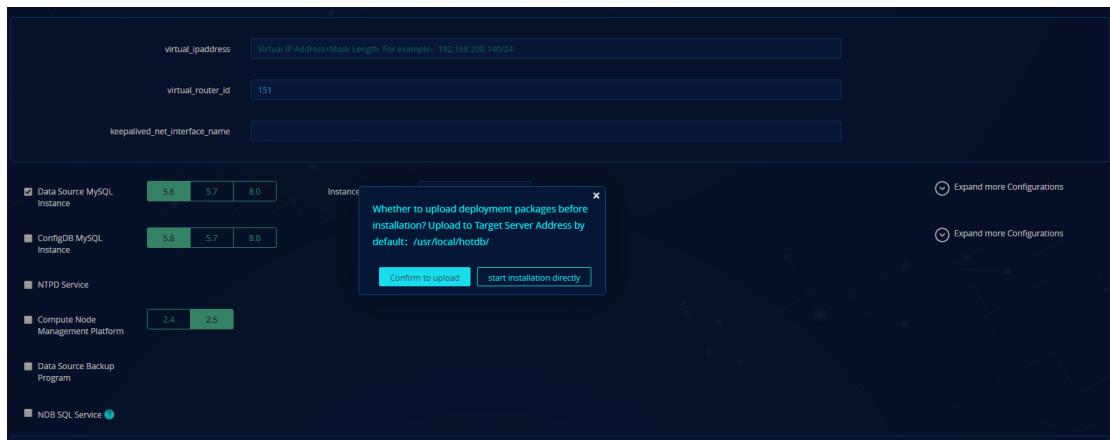
- ③ “MySQL instance port” shall be paid attention to in MySQL installation parameters, which is 3306 by default, and if the default value is occupied, the port shall be modified.
- ④ Other parameters could use the default value directly without special requirement, and for the null input box, the program will make automatic computation according to the server condition and provide default value.
- ⑤ If configDB and Data Source are installed on the same server, then configDB parameter configuration could modify “MySQL instance port” parameter only, while other more parameters could be set in Data Source only. (Reason: a server could set one MySQL parameter only)



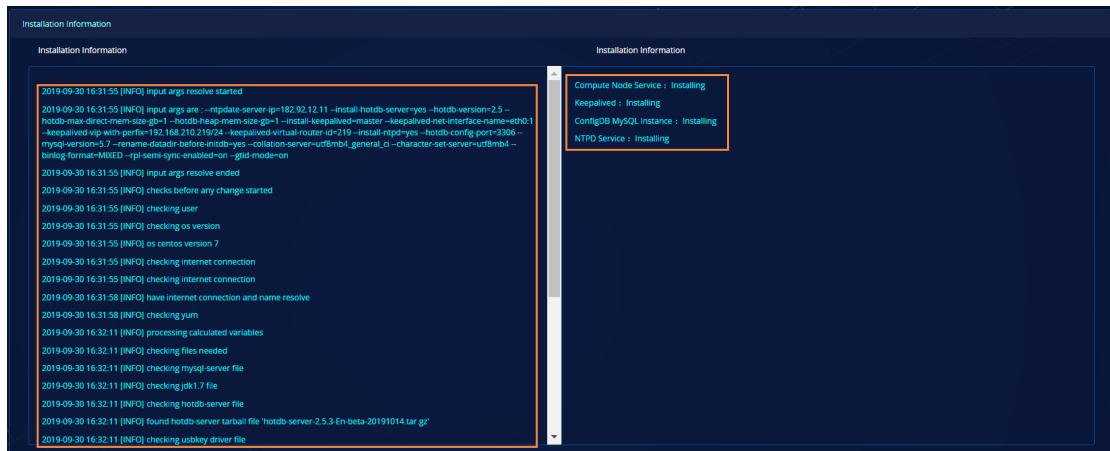
- ① When master compute node service is installed in server, “NTPD server” will check Install automatically; if there has been NTP time server already, the Install checked shall be cancelled.
- ② Every target deployment server requires specified time synchronization address.

- If NTPD server is installed on the server, then the server time synchronization address is recommended filling in Alibaba Cloud time synchronization address “182.92.12.11”
- If NTPD server is not installed on the server, then the server time synchronization address shall be specified as the address of the intranet server installed with NTPD server

- ③ Click [Save the Information] will save the configuration information for later installation, while clicking [Start Installation] will enter the installation progress directly.



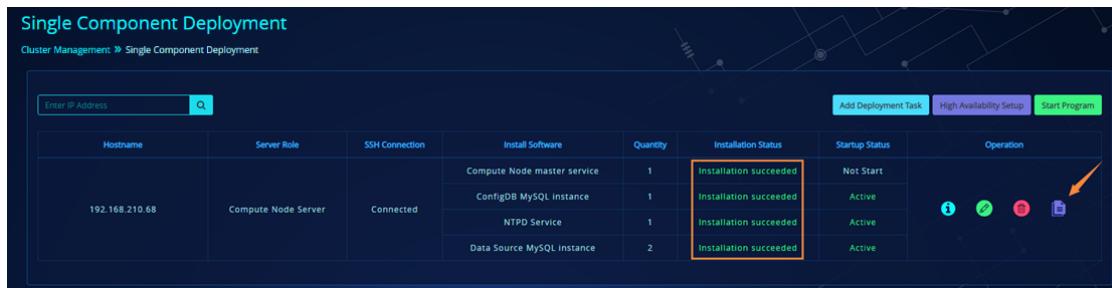
- ① At the time of initial installation, the installation deployment package of the management platform server shall be uploaded to the target deployment server, therefore, [Upload] must be clicked. Please refer to the last item of “[Function use instruction on cluster deployment](#)” for description of storing resource bundle in management platform server.
- ② If to upload the installation package to the target server /usr/local/hotdb manually or has uploaded the package resources already, click [Start installation directly] to skip the action of uploading installation package.



- ① After entering the installation progress, there will be real-time output of installation log and installation result on the bottom of the page. The installation log “hotdbinstall.log” is under “/usr/local/hotdb/ Install_Package” directory of the target server.
- ② In case of error information during the installation process, it will be marked in red, while the warning information will be marked in orange. Error information means

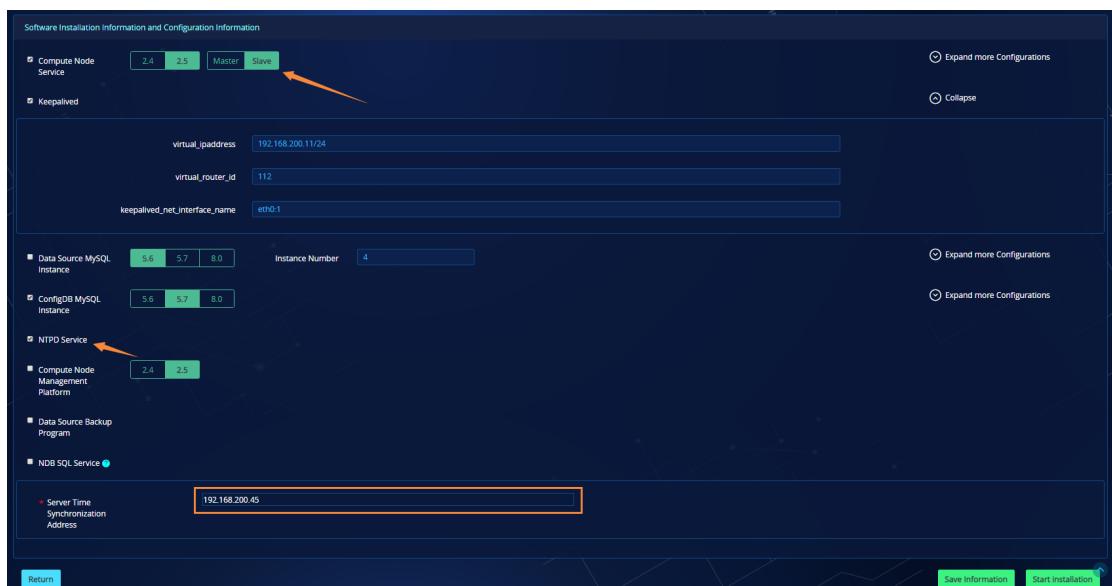
failure of the installation task this time, and re-installation shall be made after making modification according to the prompt information.

- ③ Successful installation could be judged according to whether there is: “hotdbinstall finished without error, but you should check if there is any warnings” on the installation log, and could also be judged according to the installation result on the right.



Hostname	Server Role	SSH Connection	Install Software	Quantity	Installation Status	Startup Status	Operation
192.168.210.68	Compute Node Server	Connected	Compute Node master service	1	Installation succeeded	Not Start	
			ConfigDB MySQL Instance	1	Installation succeeded	Active	
			NTPD Service	1	Installation succeeded	Active	
			Data Source MySQL instance	2	Installation succeeded	Active	

- ① The installation task in progress could be placed in the background, and then continue to add new installation tasks, and after completing the installation tasks, the installation status of the components could be viewed by refreshing the page.
- ② The saved or installed tasks could be “cloned”, clicking [Clone] could copy all configuration parameters of the task to a new deployment task, which could reduce repeated configurations appropriately.

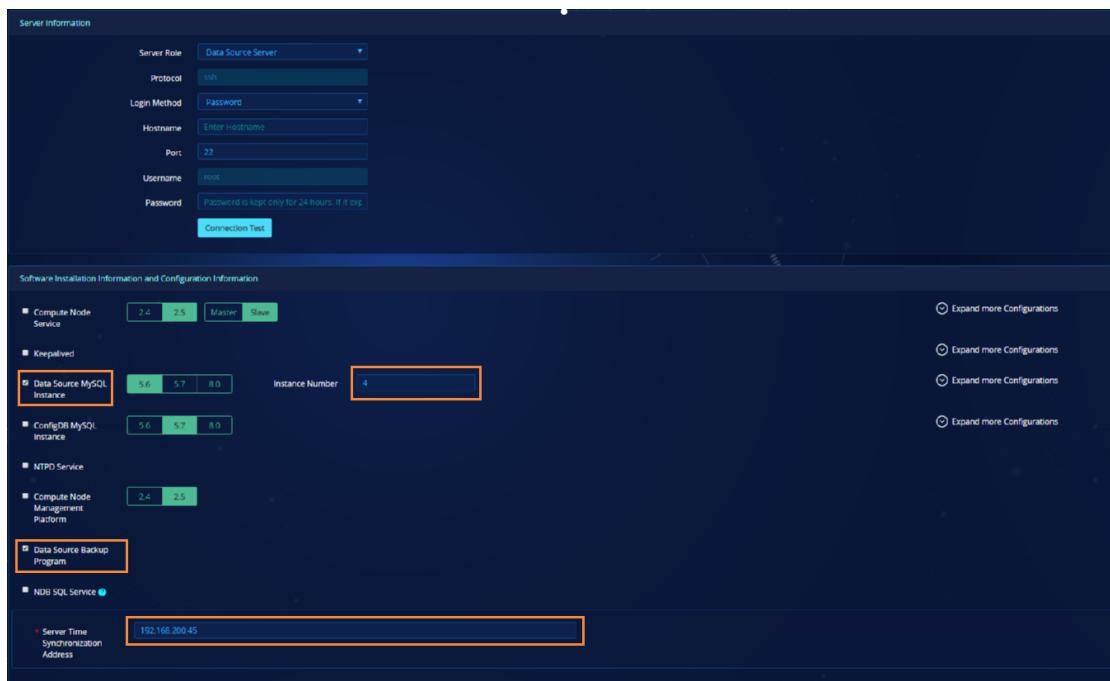


- ① Installation of standby compute node could be conducted via the installation task of master compute node before clone, and then “Hostname”, “Compute Node Role”

and other parameters shall be modified. Other parameters shall be modified according to actual condition.

- ② Attention: when installing standby compute node, “NTPD Server” does not need to be checked. You only need to fill in the “server time synchronization address” as master compute node server IP address or refer to the IP address of the installed intranet NTPD server.

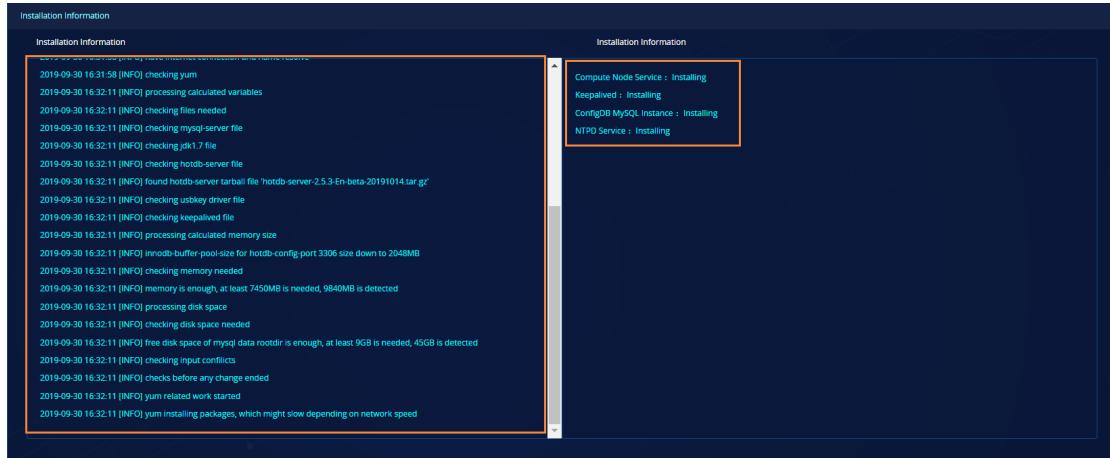
Deploy data source instance



- ① Select the “Server Role” as Data Source server, and fill in SSH information of target installation server of Data Source.
- ② According to the role, the installation component will check “Data Source MySQL instance, Data Source HotDB Listener, Data Source HotDB Backup” automatically.
- ③ The default port of the data source Listener is 3330, which can be adjusted by yourself. If you do not want to install a Listener, please uncheck it manually. Unchecking “Install listener” will be taken as an example in the following content.
- ④ According to deployment requirement, four Data Source MySQL instances shall be

installed in 192.168.200.48, therefore, the “number of instances” shall select four.

- ⑤ Server time synchronization address shall be filled in the master compute node server IP (192.168.200.45).



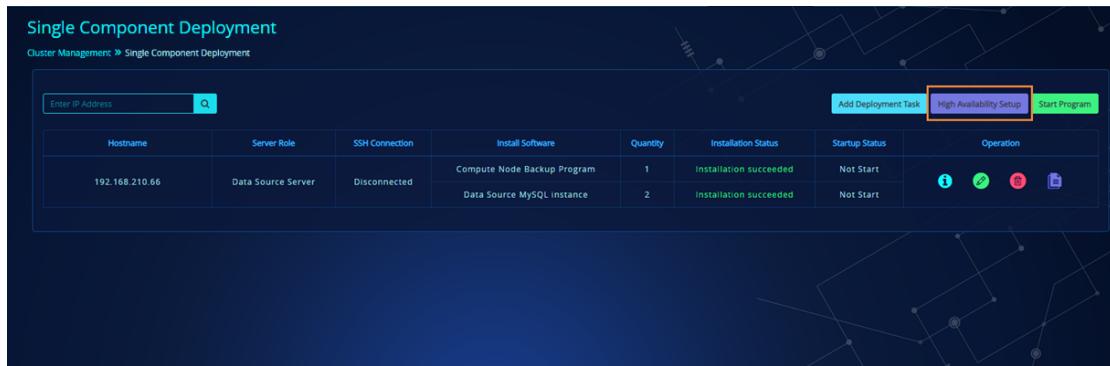
- ① Click [Start Installation] and upload the installation package to target deployment server of Data Source.
- ② Real-time installation progress could be viewed via log.
- ③ Clone the deployment task of Data Source to “192.168.200.48” via the [Clone] button, and modify the SSH information, then installation could be started.

2.2.2.5. High availability build of Single Component

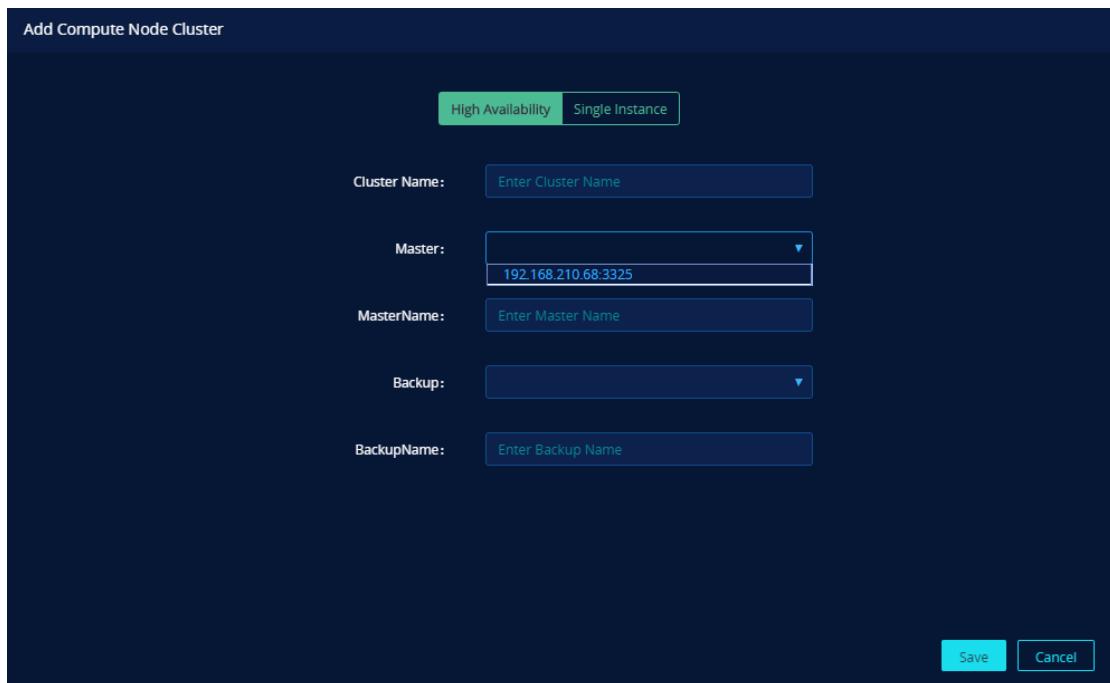
Deployment

High availability rebuild could provide high availability automatic build service for installed components in Single Component Deployment function, including Compute Node High Availability, Data Source High Availability and configDB High Availability Build.

Compute node high availability build



- ① Click [High Availability Build] button to enter the high availability build page, and then in the “Compute Node High Availability Build” module, by clicking [Add], the configuration window of adding compute node high availability will be popped up.



- ① In the pop-up window, selecting “High Availability” means building HA high availability relation for compute nodes, and selecting “Single Instance” means that the compute node is single node.
- ② Cluster name is the name of the cluster where master/standby compute node is, which could be customized but shall not be repeated with the existing cluster name.

- ③ Master is master compute node, if the previous master compute node is successfully installed but is not built, then the drop-down box will show it.
- ④ Backup is standby compute node, if “single instance” is selected on the top, then Backup does not need to be selected.
- ⑤ Master Name and Backup Name are remark name of compute node, which could be customized but shall not be repeated with the existing compute node name.
- ⑥ Clicking [Save] means starting to build high availability relation for master/standby compute node.

Compute Node High Availability Setup						
Compute Node Name	Master	MasterName	Backup	BackupName	Status	Operation
high	192.168.210.68:3325	master	192.168.210.66:3325	backup	Set up successfully	

Data Source high availability build

Node High Availability Setup						
Compute Node Name	Node Name	Active Master	Standby Slave/Standby Master	Master/Slave Setup	Operation	

Node High Availability						
Compute Node Cluster	Node Name	replication Mode	Active Master	Standby Slave	Standby Master	Operation
Please Select	dn_		Select Active Master	Select Standby Slave	Select Standby Master	

- ① Click [Batch Add] button in “node high availability build” module, if the compute node high availability is not constructed or free of build history record, then clicking [Batch Build] will prompt “Please build a compute node cluster first” (because Data Source High Availability Build needs to select the belonging compute node cluster).
- ② Adding Data Source High Availability Configuration needs to select the “Compute Node Cluster” first, and the newly constructed compute node cluster could be selected.
- ③ Node name is the Data Node Name (dataNode) to which Data Source belongs,

which could be customized but shall not be repeated with the existing Data Node Name.

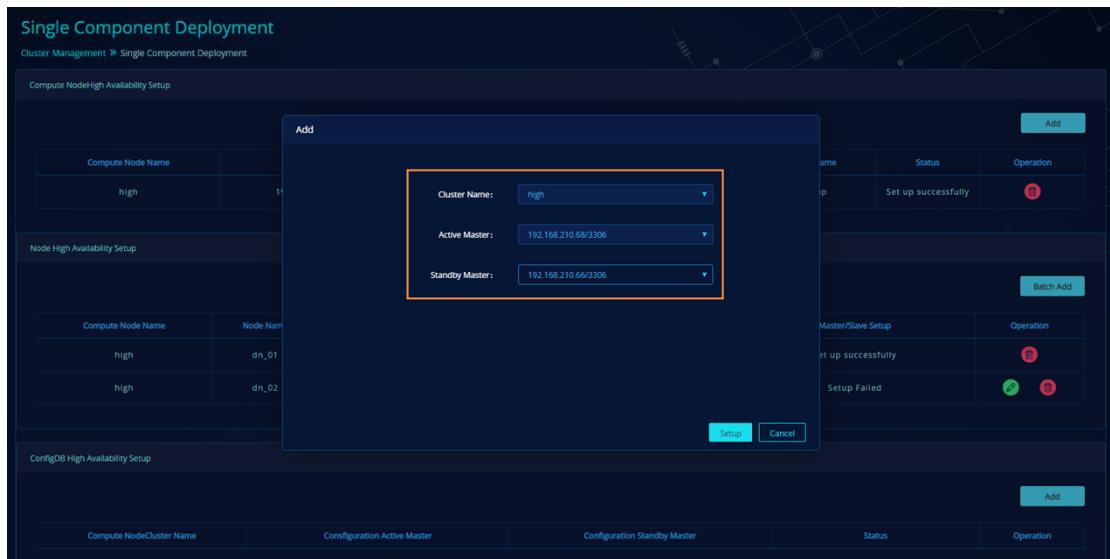
- ④ Replication mode refers to the existence mode of the Data Source under the same Data Node, at present three replication modes are supported: “single database, master/slave and master-master”.
- ⑤ When adding multiple node high availability records, new configuration record could be added by clicking “+”.
- ⑥ After completing the Node High Availability Configuration, clicking [Start Construct] will automatically build high availability replication relation for Data Source.

Node High Availability Setup					
Compute Node Name	Node Name	Active Master	Standby Slave/Standby Master	Master/Slave Setup	Operation
high	dn_01	192.168.210.66:3307	192.168.210.68:3307 (Standby Master)	Set up successfully	
high	dn_02	192.168.210.68:3308	192.168.210.66:3308 (Standby Slave)	Setup Failed	 

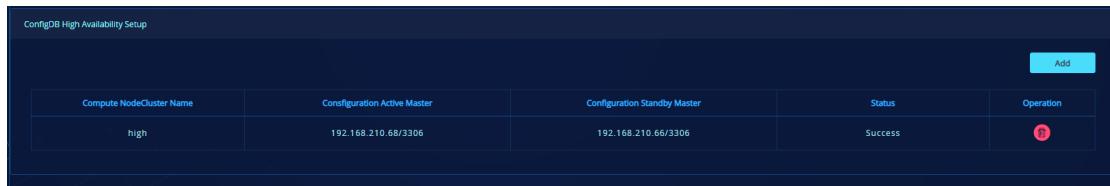
- ① Success record will be displayed with Data Node as the unit upon completion of build, and for the failure record, rebuild after modifying the parameters by clicking [Edit] button.

ConfigDB high availability build

ConfigDB High Availability Setup				
Compute NodeCluster Name	Corefiguration Active Master	Configuration Standby Master	Status	Operation
				

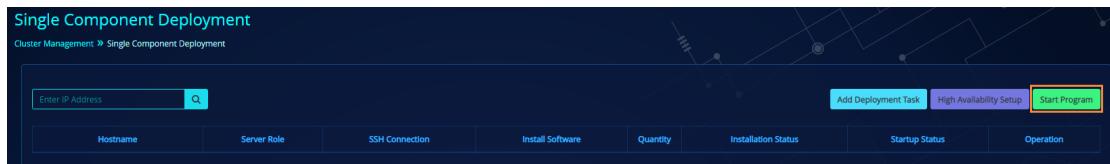


- ① Select the installed configDB instance, and select its belonging cluster, and click [Build] button to start the build.
- ② Upon completion of build, the program will modify the configDB address with standby master relation to server.xml file.

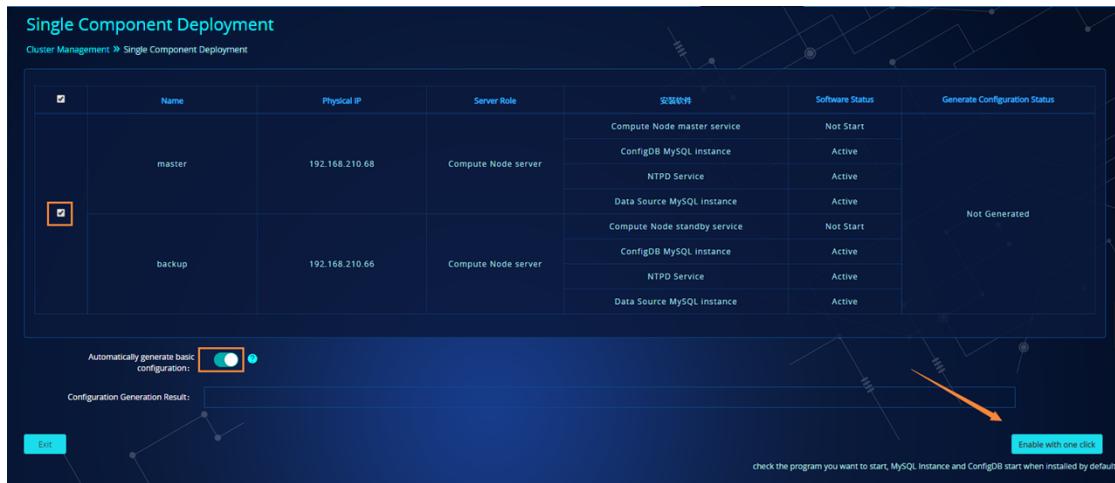


2.2.2.6. Single Component Deployment startup program

Startup program mainly provides clickOnce start service for the cluster with component installed or high availability built. At present, the services available for start are: “Compute Node, Keepalived, HotDB Backup, and Management Platform”. “Data Source MySQL instance, configDB MySQL instance, and NTPD server” will start directly after completing the program installation, without restart.

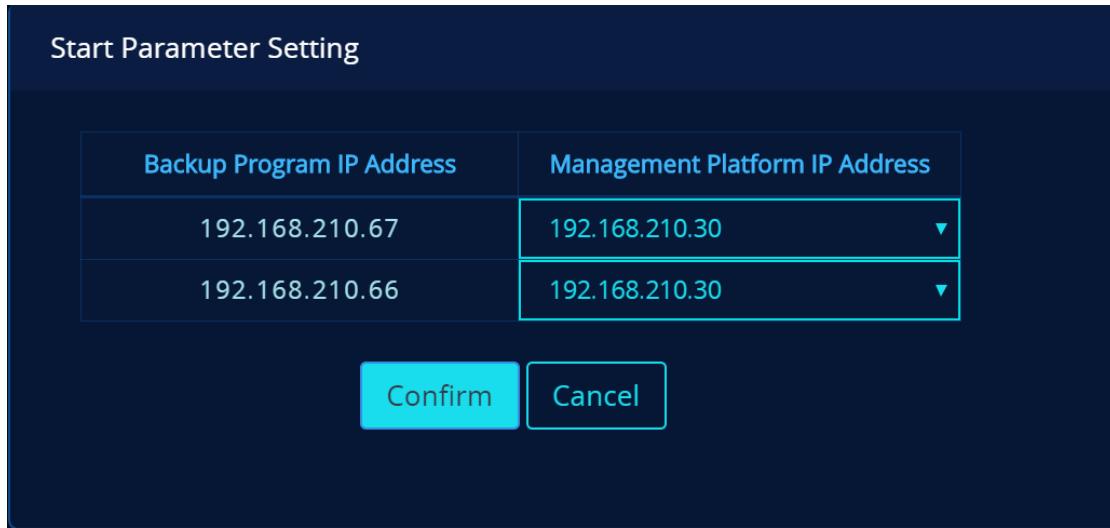


- ① The startup program page could be entered via either [Startup Program] button on the page of Single Component Deployment, or by clicking [Startup Program] directly on the lower right corner after completing high availability build.

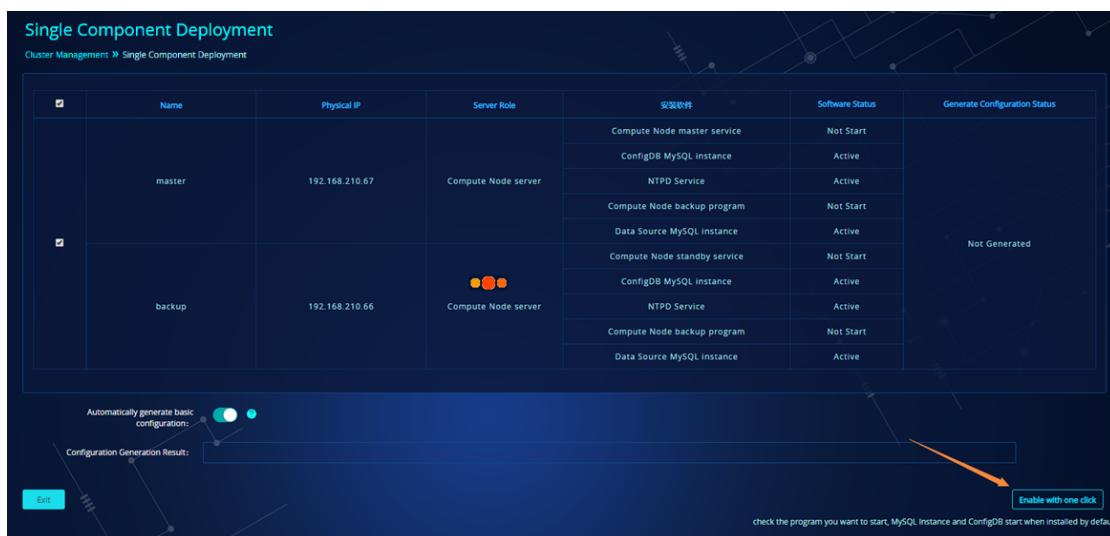


- ① Startup Program page will display records of all servers successfully installed on the Deployment Task page, and make merge display of the servers built with master/standby according to history records of high availability build.
- ② The components needing start could be selected by checking, while un-checking means not start.
- ③ The first group of records are the clusters with Compute Node High Availability Build record, and when starting, if turning on the “Automatically Generate Basis Configuration” switch, the clickOnce Startup Program will write the Compute Node Cluster, Data Node, Data Source and record information generated by default into configDB of the management platform, and the user could view directly after logging in to the management platform without re-adding the configuration.
- ④ The second and the third groups are clusters without Compute Node High Availability Build records, and there will be no configuration information generated when starting (because there is no compute node cluster to which the configuration

belongs, therefore, information cannot be generated, and **the user shall manually add to management platform after start).**



- ① If Data Source “HotDB Backup” is contained in the Start item, then there will be pop-up window of “Start Parameter Setting”, asking the user to specify the management platform IP address at the time of HotDB Backup Start.
- ② “HotDB Backup IP” is the IP address of the server of the HotDB Backup to be started, “management platform IP address” is the associated management platform IP address at the time of HotDB Backup start (the management platform IP address currently used could be selected).



- ① Click [clickOnce Start], program will start and configuration will generate.

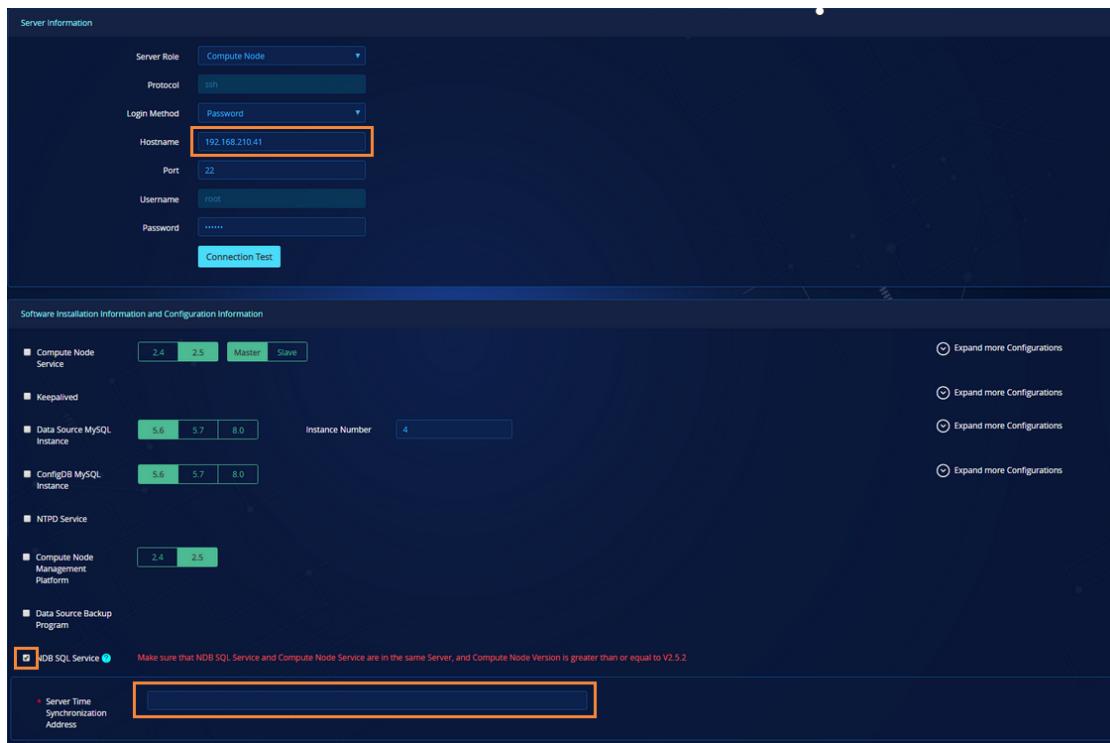
2.2.2.7. Single Component Deployment and installation of NDB SQL

If compute node has been installed, but NDB SQL server needs to be added in later period, it could be conducted via Single Component Deployment function. Relevant operating steps and notices are stated as follow:

Notice for use:

- Use Single Component Deployment function to seaprately install NDB SQL for compute node, which shall meet the requirement that the compute node in the cluster is deployed manually offline instead of using Cluster Deployment or Single Component Deployment function.
- If the Compute Node is deployed by means of Cluster Deployment or Single Component Deployment, the NDB SQL function needing to be added in later period shall be conducted by means of [Offline Manual Installation](#) only.
- NDB SQL must be installed on the same server with compute node, and the version of compute node shall be no lower than V 2.5.2.

Operating steps:



- Fill in the server address and SSH connection information of the compute node.
- Check NDB SQL server, and pay attention to the prompt in red.
- Fill in the value consistent with the specified time synchronization address at the time of Compute Node Installation

2.2.3. Description of implementing password-free login

Password-free login requires password-free channel established between two servers, and the detailed operation is as follow:

Take password-free connection between 192.168.190.186 and 192.168.190.187 for instance

- 1) Execute ssh-keygen on the server of 192.168.190.186, press Enter button for 3 consecutive times, generate public key and private key, among which id_rsa is private key and id_rsa_pub is public key, and the private key and public key files newly generated upon command could be viewed under /root/.ssh directory.

```

WARNING! The remote SSH server rejected X11 forwarding request.
Last login: Tue Apr 23 16:25:58 2019 from 192.168.190.161
[root@localhost ~]# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Created directory '/root/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
5d:c0:15:41:65:a6:c3:78:6d:e4:a2:89:b5:ee:de:ca root@localhost.localdomain
The key's randomart image is:
+-- [ RSA 2048] ----+
|       .O+=+ |
|       .+ B   |
|       o B +  |
|       + * +  |
|      S =     |
|       .       |
|       .       |
|       o .    |
|      .E..    |
+-----+
[root@localhost ~]# cd /root/.ssh/
[root@localhost .ssh]# ll
total 8
-rw----- 1 root root 1679 Apr 24 20:28 id_rsa
-rw-r--r-- 1 root root  408 Apr 24 20:28 id_rsa.pub

```

- 2) Input IP of ssh-copy-id target server, and then input password of the target server, thus the public key could be sent to the target server

```

[root@localhost .ssh]# ssh-copy-id 192.168.190.187
The authenticity of host '192.168.190.187 (192.168.190.187)' can't be established.
ECDSA key fingerprint is 2e:c8:cf:b1:99:87:b7:39:0e:c0:91:ef:d2:3d:78:05.
Are you sure you want to continue connecting (yes/no)? y
Please type 'yes' or 'no': yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted now it is to install the new keys
root@192.168.190.187's password: 输入192.168.190.187服务器SSH用户密码
Number of key(s) added: 1

```

- 3) View the public key file “authorized_key” sent from 192.168.190.186 server on 192.168.190.187 server

```

Connecting to 192.168.190.187:22...
Connection established.
To escape to local shell, press 'Ctrl+Alt+'.

WARNING! The remote SSH server rejected X11 forwarding request.
Last login: Fri Apr 19 16:27:02 2019 from 192.168.190.162
[root@localhost ~]# cd /root/.ssh/
[root@localhost .ssh]# ll
total 4
-rw----- 1 root root 408 Apr 24 20:29 authorized_keys

```

- 4) Test whether successful login could be made directly from 192.168.190.186 server ssh to 192.168.190.187 server without inputting password.

```
[root@localhost ~]# ssh 192.168.190.187
Last login: Wed Apr 24 20:32:14 2019 from 192.168.190.186
[root@localhost ~]# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:b7:c6:45 brd ff:ff:ff:ff:ff:ff
    inet 192.168.190.187/24 brd 192.168.190.255 scope global enp0s3
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:feb7:c645/64 scope link tentative dadfailed
        valid_lft forever preferred_lft forever
```

2.2.4. Description of deployment script

Without using management platform, you could also install directly using Installation Script by means of adding --xxx=xxx to behind hotdbinstall.sh script

2.2.4.1. Description of script parameters

Parameter name	Description of parameter
dry-run	Check only with no Modification. You can choose "yes" or "no", among which "no" is the default option.
hotdb-version	Specify major version No. of HotDB. You can choose "2.3", "2.4" and "zabbix", among which "2.4" is the default option.
install-hotdb-server	Install HotDB-server or not. You can choose "yes" or "no", among which "no" is the default option.
install-ndbsql	Install NDB SQL or not. You can choose "yes" or "no", among which "no" is the default option.
install-hotdb-listener	Install HotDB-listener or not. You can choose "yes" or "no", among which "no" is the default option.
--listener-heap-mem-size-gb	If specified, it will help modify the heap

	memory in HotDB Listener startup script from 4G to specified value, with no Modification by default
--listener-max-direct-mem-size-gb	If specified, it will help modify the direct memory in HotDB Listener startup script from 24G to specified value, with no Modification by default
hotdb-use-g1	If specified, it will help modify the hotdb startup script to using G1 Garbage Collector, with no Modification by default
hotdb-heap-mem-size-gb	If specified, it will help modify the heap memory in hotdb startup script from 4G to specified value, with no Modification by default
hotdb-max-direct-mem-size-gb	If specified, it will help modify the direct memory in hotdb startup script from 24G to specified value, with no Modification by default
install-hotdb-server-management	Install HotDB-server-management or not. You can choose "yes" or "no", among which "no" is the default option.
install-hotdb-backup	Install HotDB-backup or not. You can choose "yes" or "no", among which "no" is the default option.
mysql-version	Specify major version No. of MySQL. You can choose "5.6" and "5.7", among which "5.6" is the default option.
mysql-port-list	Specify list of the MySQL data source ports to be installed, separate by comma, in ascending order, for example: "3306,3307,3308,3309", null by default

hotdb-config-port	Specify list of configDB ports to be installed, which cannot conflict with the MySQL data source ports, null by default
hotdb-config-init	Initialize hotdb_configDB in the specified instance of hotdb-config-port or not. You can choose "yes" or "no", among which yes is for installing HotDB-server, and no is for not installing HotDB-server by default.
mysql-data-diskname	Specify the name of the disk device used for MySQL data directory, if the device is neither mounted nor formatted, it will be automatically formatted and mounted to the data directory, null by default
mysql-data-rootdir	Specify the root directory of MySQL data directory to be used, "/data" by default, and it must be absolute path
rename-datadir-before-initdb	Specify whether to rename the potential old data directory or not before initializing the database, "yes" by default
server-id-prefix	Specify the prefix for server-id, which is required to be the number smaller than 429496, and automatically computed by default, but absolutely no conflict is not guaranteed
character-set-server	Specify the Character Set. You can choose "latin1", "gbk", "utf8", and "utf8mb4", among which "utf8mb4" is the default option.
collation-server	Specify the Proofreading Set. "latin1_swedish_ci" "latin1_bin" "gbk_chinese_ci" "gbk_bin" "utf8_general_ci", "utf8_bin" "utf8mb4_general_ci" "utf8mb4_bin" are optional, and the default value is the default

	proofreading set of the character set configured
innodb-buffer-pool-size-mb	The innodb-buffer-pool-size with MB as the unit is computed automatically by default
innodb-log-file-size-mb	The innodb-log-file-size with MB as the unit, is computed automatically by default
innodb-data-file-size-mb	The ibdata file with MB as the unit is "4096" by default
innodb-io-capacity	Specify the size of innodb-io-capacity, which is computed automatically by default
innodb-flush-log-at-trx-commit	Specify innodb-flush-log-at-trx-commit setting, "2" by default
sync-binlog	Specify sync-binlog setting, "10" by default
binlog-format	Specify binlog-format setting, "MIXED" and "ROW" are optional, "MIXED" by default
gtid-mode	Enable gtid or not, "on" and "off" are optional, "on" by default
rpl-semi-sync-enabled	Start semi-synchronous replication or not, "on" and "off" are optional, "on" by default
mgr-group-name-list	MySQL port number:MGR group's UUID:list of MGR local port number, separate by comma, and if this parameter is provided, MGR will open for corresponding port, for example "3306:540c2b46-5d73-11e8-ad9b-00a0c9000000:33060,3308:5f5c1e2d-5d73-11e8-ad9b-00a0c9000000:33080", null by default. (Notice: the MySQL instance to be created still needs to be specified in mysql-port-list and hotdb-config-port)

mgr-group-local-ip	Local IP address bound by MGR local port, which is automatically computed by default
mgr-group-seeds-list	MySQL port number:MGR group member's IP:port comma-separated list, separate by slash, and if this parameter is provided, this value will be added to corresponding port of my.cnf file, null by default, for example "3306:192.168.200.101:33060,192.168.200.102:33060,192.168.200.103:33060/3308:192.168.200.101:33080,192.168.200.102:33080,192.168.200.103:33080"
creat-hotdbroot-in-mysql	Create hotdb_root user in MySQL or not, the user owns all privileges, and could connect from optional position, password as hotdb_root by default, "yes" and "no" are optional, "no" by default
install-keepalived	Install keepalived or not, "master", "backup" and "no" are optional, "no" by default
keepalived-vip-with-prefix	If specified, it will help substitute the vip in keepalive configuration from 192.168.200.140/24 to the value, no Modification by default
keepalived-virtual-router-id	If specified, it will help substitute the virtual-router-id in keepalive configuration from 151 to the value, no Modification by default

keepalived-net-interface-name	If specified, it will help substitute the vip device name in keepalive configuration from eth0:1 to the value, no Modification by default
install-lvs	Install lvs server or not, "master", "backup" and "no" are optional, "no" by default
lvs-vip-with-prefix	If specified, it will help substitute the vip in lvs configuration from 192.168.56.203/24 to the value, no Modification by default
lvs-port	If specified, it will help substitute the Listening Port in lvs configuration from 3306 to the value, no Modify by default, and the port shall be the same with the data service port of HotDB cluster
lvs-virtual-router-id	If specified, it will help substitute the virtual-router-id in lvs configuration from 51 to the value, no Modification by default
lvs-net-interface-name	If specified, it will help substitute the vip device name in lvs configuration from eth1:2 to the value, no Modification by default

lvs-real-server-list	Lvs back-end HotDB server IP:data service port:management port list, separate by comma, for example "192.168.0.1:3323:3325,192.168.0.2:4323:4325", null by default
lvs-real-server-user	Username used by the management port of lvs physical checkup script connection back-end HotDB server, "root" by default
lvs-real-server-password	Password used by the management port of lvs physical checkup script connection back-end HotDB server, "root" by default
lvs-real-server-startup-type	When as realserver of lvs, configuration mode of relevant adjustments of the server, "no", "config" and "service" are optional, "no" by default
install-ntp	Install ntpd or not, "yes" and "no" are optional, if HotDB is installed, then yes by default, otherwise no by default. Notice: there shall be only one ntpd in a HotDB cluster; HotDB standby shall synchronize time with the HotDB host. If there is ntp source in the intranet, then ntpd may not be installed.
ntpdate-server-ip	Configure ip address of time synchronization, either parameter or ntpdate-server-host must be specified, and only one of them shall be specified. If ntpd is installed, the time source beyond the HotDB cluster must be specified; if ntpd is not installed, server address of the

	internal ntpd service of HotDB cluster shall be specified (if the host HotDB is installed ntpd server), or intranet ntpd server address, then outer-net address shall not be selected.
ntpdate-server-host	Configure host address of time synchronization, which is allowed to be domain name or ip, script will make no processing or checkup of the parameter, and it needs to rely on the caller to guarantee accuracy, either the parameter or ntpdate-server-ip must be specified and only one of them shall be specified. If ntpd is installed, the time source beyond the HotDB cluster must be specified; if ntpd is not installed, server address of the internal ntpd service of HotDB cluster shall be specified (if the host HotDB is installed ntpd server), or intranet ntpd server address, then outer-net address shall not be selected.

2.2.4.2. Instruction on use of parameters

Combined use of parameters: parameter name = value + blank+ parameter name=value, for example:

```
--hotdb-heap-mem-size-gb=1 --hotdb-max-direct-mem-size-gb=1 --ntpdate-server-ip=192
.168.200.140 --rpl-semi-sync-enabled=on --mysql-version=5.7 --hotdb-config-port=3316 --install-ntp=yes --
install-hotdb-server=yes --hotdb-version=2.5 --install-hotdb-backup=yes --mysql-port-list=3307,3308 --install-
hotdb-server-management=yes
```

Install data source Listener using script:

```
--hotdb-heap-mem-size-gb=1 --hotdb-max-direct-mem-size-gb=1 --ntpdate-server-ip=192
.168.200.140 --rpl-semi-sync-enabled=on --mysql-version=5.7 --hotdb-config-port=3316 --install-ntpd=yes --
install-hotdb-server=yes --install-hotdb-listener=yes --hotdb-version=2.5 --install-hotdb-backup=yes --mysql-
port-list=3307,3308 --install-hotdb-server-management=yes
```

Method used for running script:

sh -x script name .sh+ space + parameter string

```
sh -x hotdbinstall_v*.sh --hotdb-heap-mem-size-gb=1 --hotdb-max-direct-mem-size-gb=1
--ntpdate-server-ip=192.168.200.140 --rpl-semi-sync-enabled=on --mysql-version=5.6 --hotdb-config-port=3316
--install-ntpd=yes --install-hotdb-server=yes --hotdb-version=2.4 --install-hotdb-backup=yes --mysql-port-
list=3307,3308 --install-hotdb-server-management=yes
```

2.2.4.3. Other descriptions of script

1. Since the clickOnce Deployment and Installation Script at present requires tunescript, and NIC related hardware parameters will be modified in tunescript, which may result in temporary loss of NIC response or interior restart of NIC. It's known that under the environment of Bond configured, short-time network interruption may be caused due to that the operating system response or interchanger response is not quick enough, thus resulting in SSH terminal disconnection or HotDB interruption, part of which could be relieved through shortening the Bond configuration parameter miimon=100.
2. Before installation, it's recommended closing the built-in firewall and selinux functions of the server (selinux restart is effective).