vinchin

VINCHIN BACKUP & RECOVERY v7.0

User Guide for Oracle Database

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成都云祺科技有限公司
Chengdu Vinchin Technology Co.,Ltd.

Table of Contents

Supported Oracle Database Environments

Oracle Database (Stand-alone)	11g/11g R2	Windows Server 2008 R2/RHEL 6, 7
	12c	Windows Server 2012/ RHEL 7
	18c	Windows Server 2016
	19c	Windows Server 2019/ RHEL 7
	21c	Windows Server 2019/ RHEL 8
Oracle Database (RAC)	11g R2 RAC	RHEL 6
	19c RAC	RHEL 7

Preparation for Oracle Backup

Deploy Backup Agent for Linux Server

Download Agent for Linux Server

Open the web console of Vinchin Backup & Recovery, on the login screen, click on **Download Backup Plugin** to show the agent download options.
In the **Type** dropdown list, please select **Physical Backup Agent** option.
In the **OS** dropdown list, please select the target Linux distribution.
Click on **Download** button to download the backup agent for the Linux servers.
The downloaded backup agent installer for Linux server should be a .tar.gz package. If you've downloaded it on a Windows desktop, please upload it to the Linux server which you wish to backup.

Install Agent for Linux Server

Login to the command line interface (CLI) of the Linux server. Install the backup agent follow the steps below.
1. By using the below command to decompress the .tar.gz package.

```
tar -zvxf vinchin-backup-agent-xxx-x86_64.tar.gz
```

Where the 'xxx' should be the version number and Linux distribution same as the actually downloaded installer.

2. Enter the backup plugin package folder.

```
cd vinchin-backup-agent-xxx-x86_64
```

Where the 'xxx' should be the version number and Linux distribution same as the folder decompressed from the agent installer.

3. Install with the below command.

```
./agent_install
```

Once you execute the agent install command, the installation will begin, and during the installation process, you need to specify the agent connection mode and maybe required to specify the backup server IP based on connection mode you choose.

4. Choose the connection mode.

```
1) Server-to-client
2) Client-to-server
Please select connection mode [1,2] <default 2>:
```

Choose between 1 and 2 to determine “server to client” or “client to server” connection mode.
If 1 (input 1 and press enter), the agent will only be installed and will not connect to server, users will have to add the agent from Vinchin Backup & Recovery web console after the agent installation.
If 2 (directly press enter or input 2 and press enter), users will be asked to provide the Vinchin backup server IP for the agent being able to automatically connect to after the installation.

5. Specify backup server IP.
Only if the connection mode is 2, users will be asked to specify the backup server IP.

```
Please select connection mode [1,2] <default 2>:2
Please input backup server IP:172.18.1.10
```

Please enter Vinchin backup server IP then press enter.

6. Specify client/server listening port.
If the connection mode is 1, users will be asked to specify the client listening port. It’s not recommended to change the port number, please press enter to continue.
If the connection mode is 2, users will be asked to specify the server listening port. It’s not recommended to change the port number, please press enter to continue.

7. Specify client transport port.
It’s not recommended to change the client transport port, please press enter to confirm the installation.
Once the users completed the above settings, the installation will be done in a few seconds, if you had chosen connection mode 1 (server to client), after the agent installation, please open Vinchin Backup & Recovery web console to add the agent to Vinchin backup server, please refer to Add Agent.

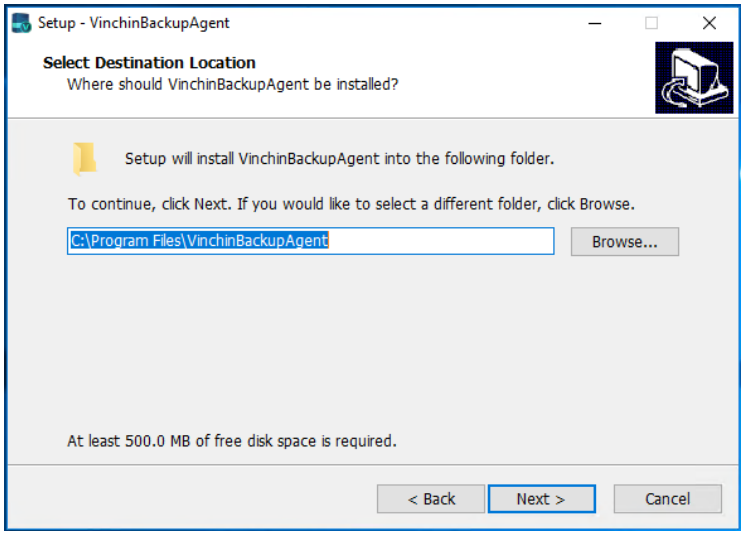
Deploy Agents for Windows Server

Download Agent

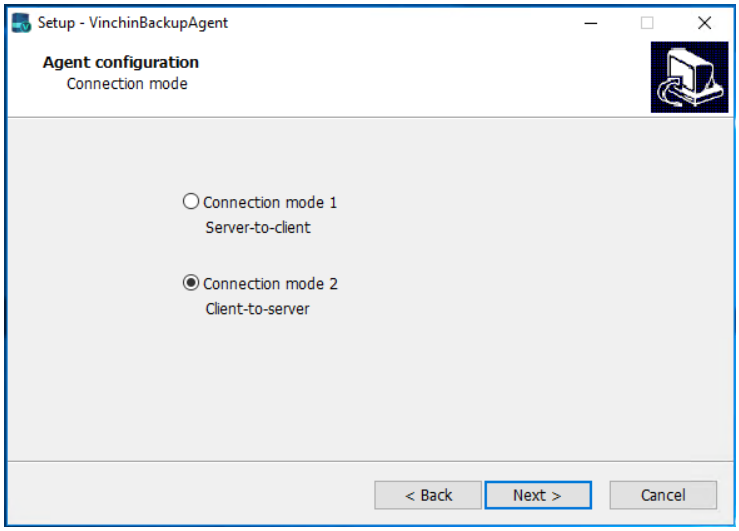
Open the web console of Vinchin Backup & Recovery on the target Windows server which you wish to backup, on the login screen, click on **Download Backup Plugin** to show the agent download options.
In the **Type** dropdown list, please select **Physical Backup Agent** option.
In the **OS** dropdown list, please select **Windows**.
Click on **Download** button to download the backup agent for the Windows servers.
The downloaded backup agent installer for Window should be a .exe package. If you’ve downloaded it on another Windows desktop, please upload it to the Windows server which you wish to backup.

Install Agent

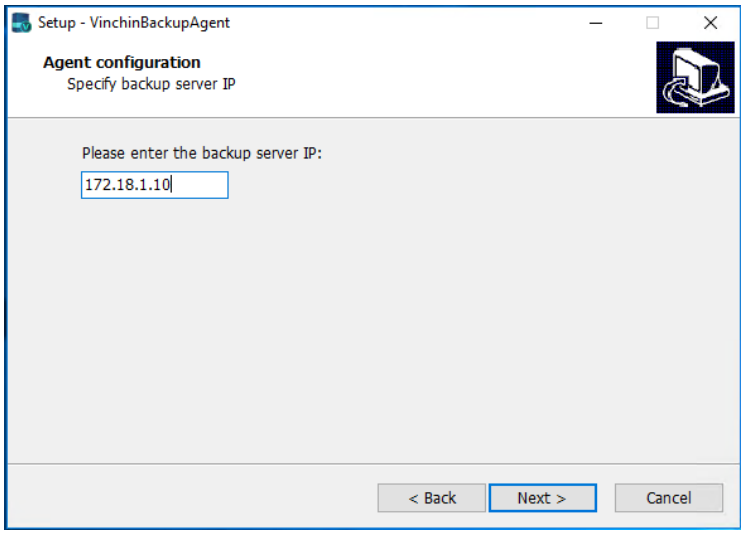
Please follow the installation wizard to complete the database backup agent installation.
nstall the backup agent follow the steps below.
1. Run the backup agent installer with administrator permission by right clicking on the installer and select **Run as administrator**.
2. Specify installation location.



It's recommended to install the backup agent in the default location.
3. Specify connection mode.



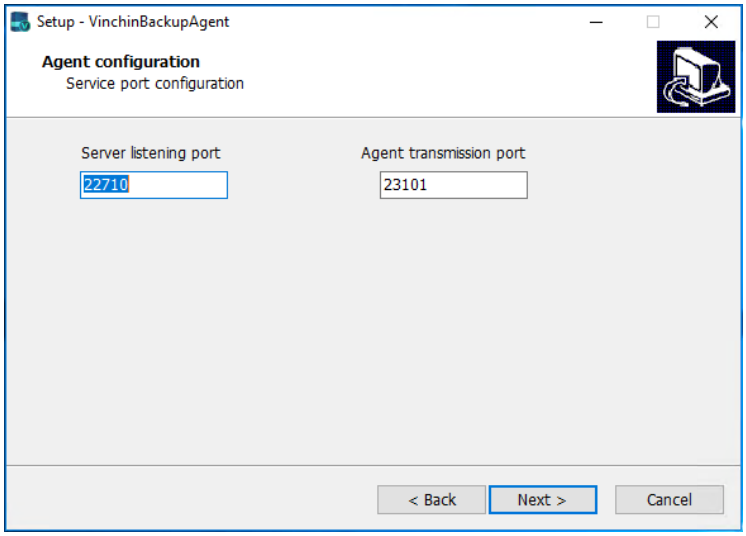
Choose between Connection mode 1 and 2 to determine "Server-to-client" or "Client-to-server" connection mode.
If Connection mode 1, the agent will only be installed and will not connect to server, users will have to add the agent from Vinchin Backup & Recovery web console after the agent installation.
If Connection mode 2, users will be asked to provide the Vinchin backup server IP for the agent being able to automatically connect to after the installation.
4. Specify backup server IP.



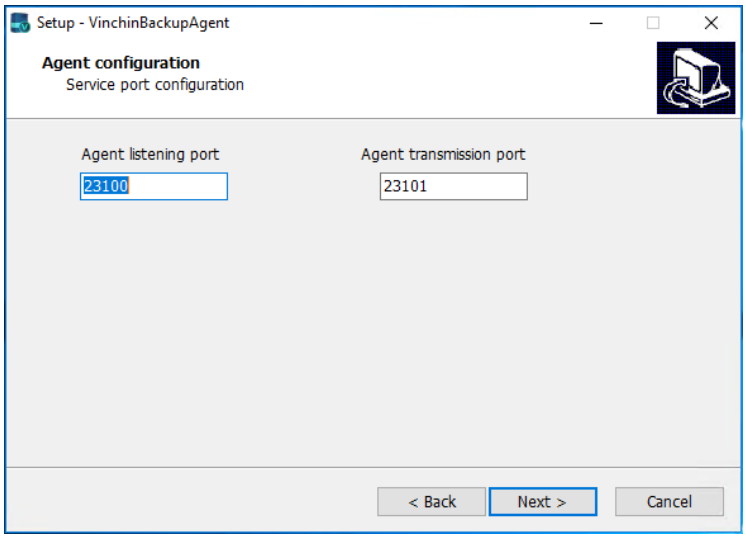
If you had chosen Connection mode 2, please enter the backup server IP address and click on next to continue.

5. Port configurations.

If Connection mode 1, users have to specify the Agent listening port and Agent transmission port.

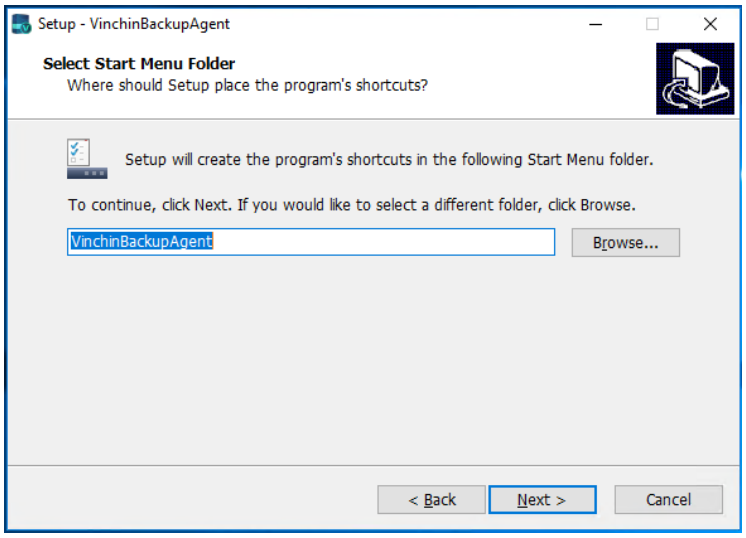


If Connection mode 2, users have to specify the server listening port and agent transmission port.



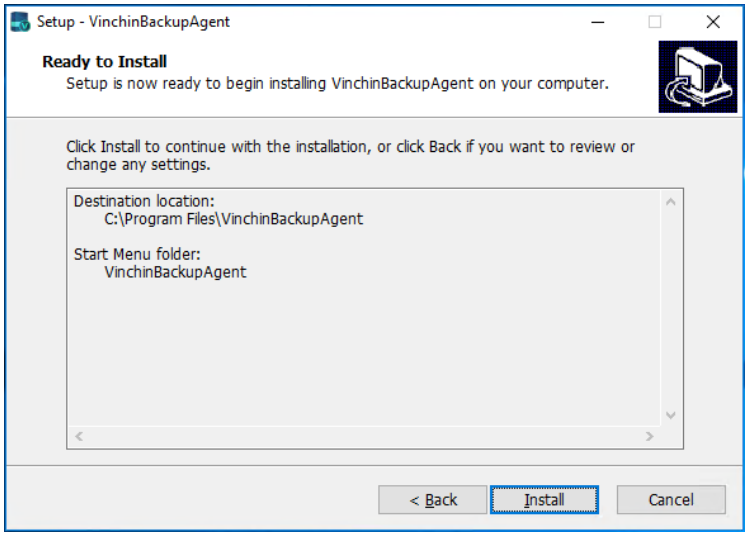
For both scenarios, it’s always recommended to use the default port numbers.

6. Specify the start menu folder.



Please use the default folder and click on **Next** to continue.

7. Confirm installation.



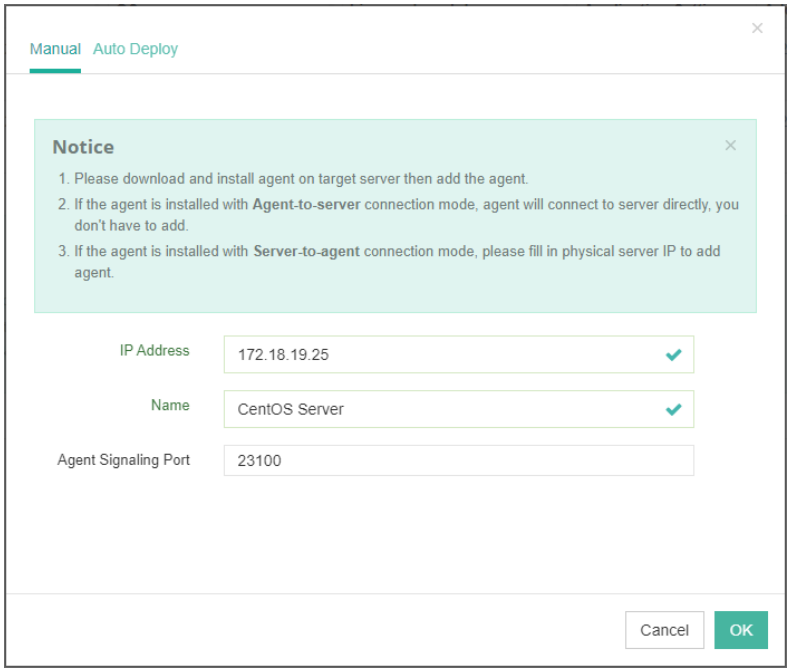
If there's no issue with the installation location and the start menu folder, please click on **Install** to confirm the agent installation.

Once the installation is completed, please click on Finish to exist the agent installation wizard. If you had chosen Connection mode 1 (Server-to-client), after the agent installation, please open Vinchin Backup & Recovery web console to add the agent to Vinchin backup server, please refer to Add Agent.

Add Agent

No matter for Linux or Windows backup agents, if the connection mode is 1 (Server-to-client), after the agent installation, users have to added the agents from Vinchin Backup & Recovery web console from **Resources** > **Agents** page.

Click on **Add** button to add the agent.

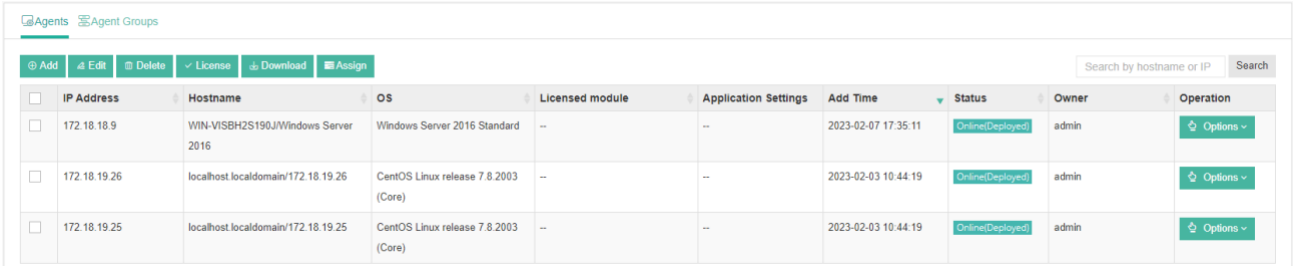


In the **IP Address** field, please input the IP of the Linux/Windows server which you had installed the agent with Server-to-client connection mode.

In the **Name** field, you can give it a name for identification.

As for the **Agent Signaling Port**, it's not recommended to change it, please leave it as default.

Once done, click **OK** to add the agent.



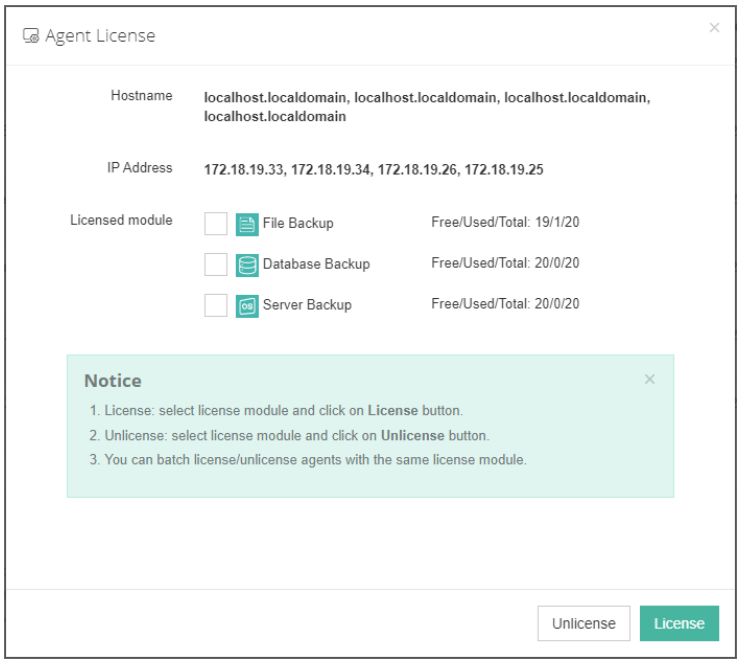
All agents connected to Vinchin backup server, no matter with Server-to-client or Client-to-server mode, will be all list on the **Resources** > **Agents** page.

License Agents

All physical backup agents connected to Vinchin backup server will be listed on the **Resources** > **Agents** page.

Before users can perform file, database or server backup, the agents need to be licensed with corresponding license modules.

Select one or a group of physical backup agents and click on License button, you'll be able to enable backup of those agents.



The physical backup agents can be licensed with File Backup, Database Backup and Server Backup license modules. According to the workloads running on the physical server, please select corresponding module and then click on **License** button to get the agents licensed for backup.

To unlicense the agents, please also select the corresponding module and click on **Unlicense** button to get the agents unlicensed.

Configure Application

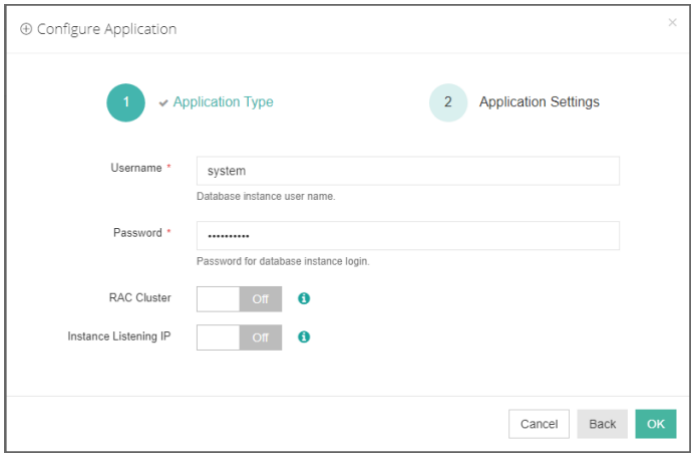
After the installation of Vinchin physical backup agent on Oracle database server, users have to license the agent with database backup module.

When done installation and licensing, please open Vinchin Backup Server web console and go to **Resources** > **Agents** page, find the target agent, click on **Options** and then select **Application** to configure application settings for database backup.

Click on **Configure Application** button to configure the application settings.

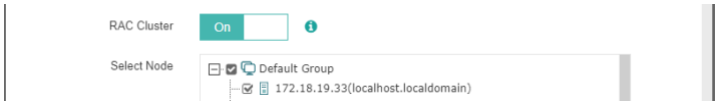
In the **Application Type** dropdown list, please select **Oracle**.

The database instances of Oracle will be listed in the **Select Instance** field. For standalone Oracle database server, select the database instance and click on **Next** button to get the instance authenticated for backup.

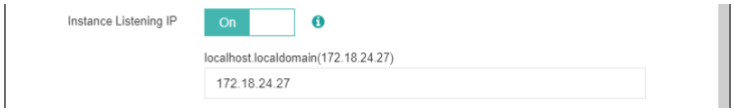


For RAC cluster, database backup agent needs to be installed on each of the cluster nodes, then add all nodes (backup agents) to Vinchin backup server.

To enable RAC cluster, turn the **RAC Cluster** option on, and in the **Select Node** field, select all the other nodes of the RAC cluster.

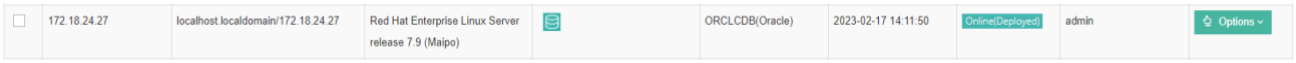


For the **Instance Listening IP**, if the backup server or the database server is on the Internet, this option needs to be turned on.



The IP address of the database instance where the agent is installed must be provided here. When done the above settings, click on **OK**.

When Oracle application is successfully configured, in the agents list, you should see the agent look like below.



Now you should be able to create backup jobs for the Oracle database server.

Before Backing Up Oracle Database

It's recommended to grant sysdba permission to the system user, then use system user to backup Oracle database. The user to be used to backup Oracle database must have dba and sysdba permissions. You can login to oracle database use below commands to check user permissions.

Check if GRANTED_ROLE = DBA by using command:

```
select * from dba_role_privs where grantee='username';
```

Check if SYSDBA = TRUE by using command:

```
select * from v$pwfile_users where username='username';
```

Notice

1. If database server is Linux, the database backup agent needs to use 2 service ports: 23100, 23101. On the database server firewall, these 2 ports need to be opened for Vinchin backup server.

2. To add RAC Cluster, database backup agent needs to be installed on all the cluster nodes, and all nodes (agents) need to be added to Vinchin.

3. Choose one Oracle database agent to do Instance Authentication for the RAC cluster.

4. To back up the Oracle RAC cluster environment, run the show all command on the RMAN command line to check whether the control file snapshot is set to the shared storage.

5. Only one backup job needs to be created for one of the RAC cluster node.

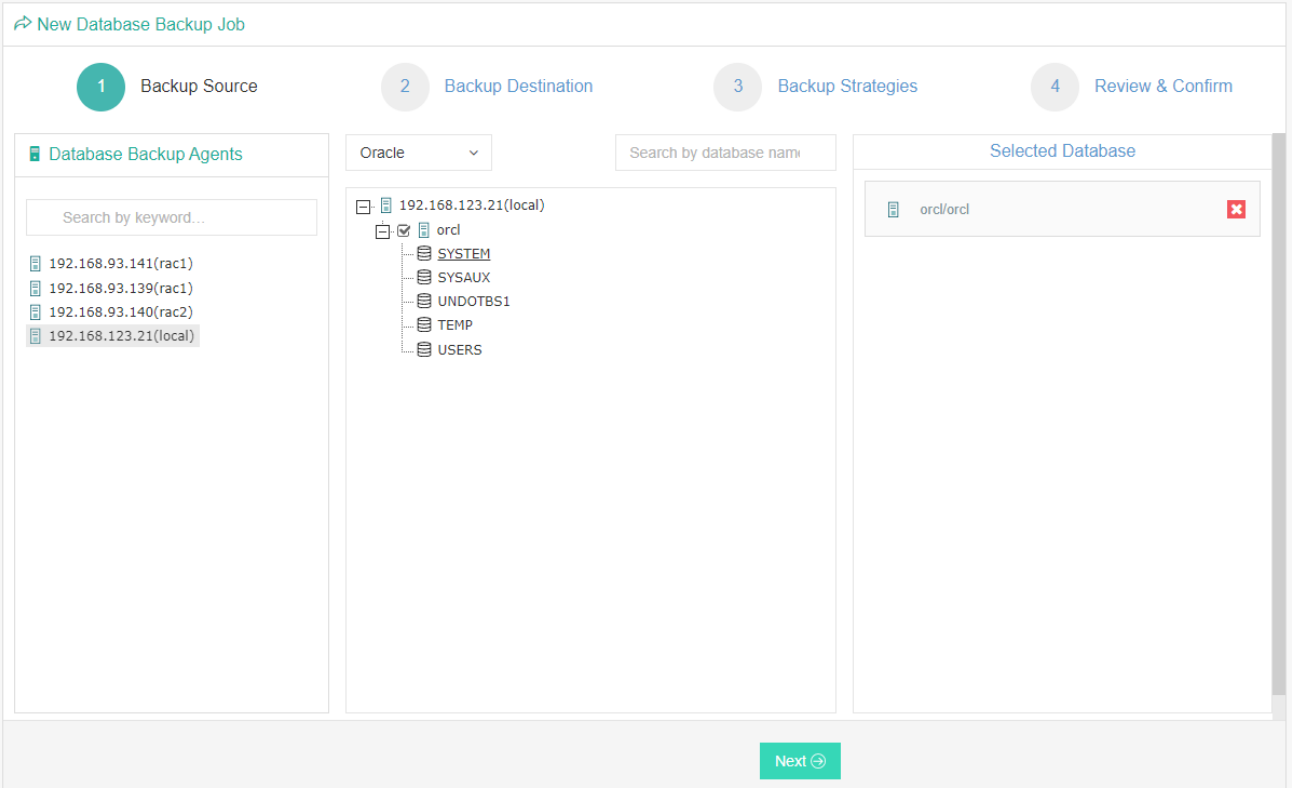
6. If one or some of the RAC cluster node fail, backup will be performed on other node, there's no need to modify the backup job under such situation.

7. Archivelog mode needs to be enabled with the database instance before taking backups.

Create Oracle Backup Job

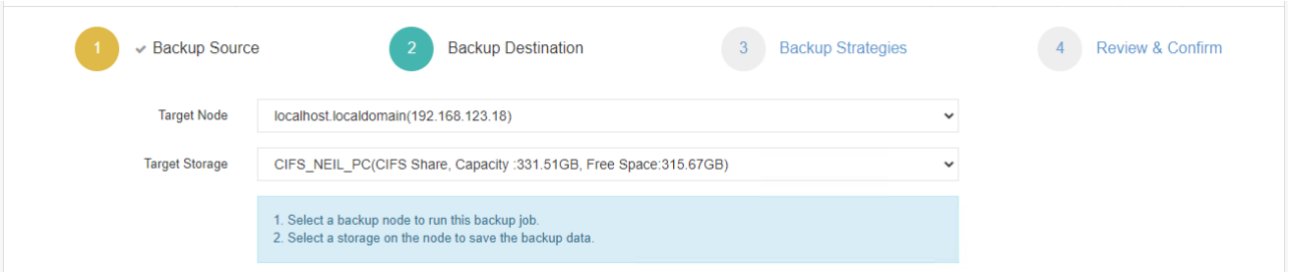
Step 1: Backup Source

First you need to select a target host from the left column, then select Oracle database instance you wish to backup, in the right column will show the instance you select. Click on next to step 2.



Step 2: Backup Destination

A backup destination (backup storage) should be associated with this backup job.

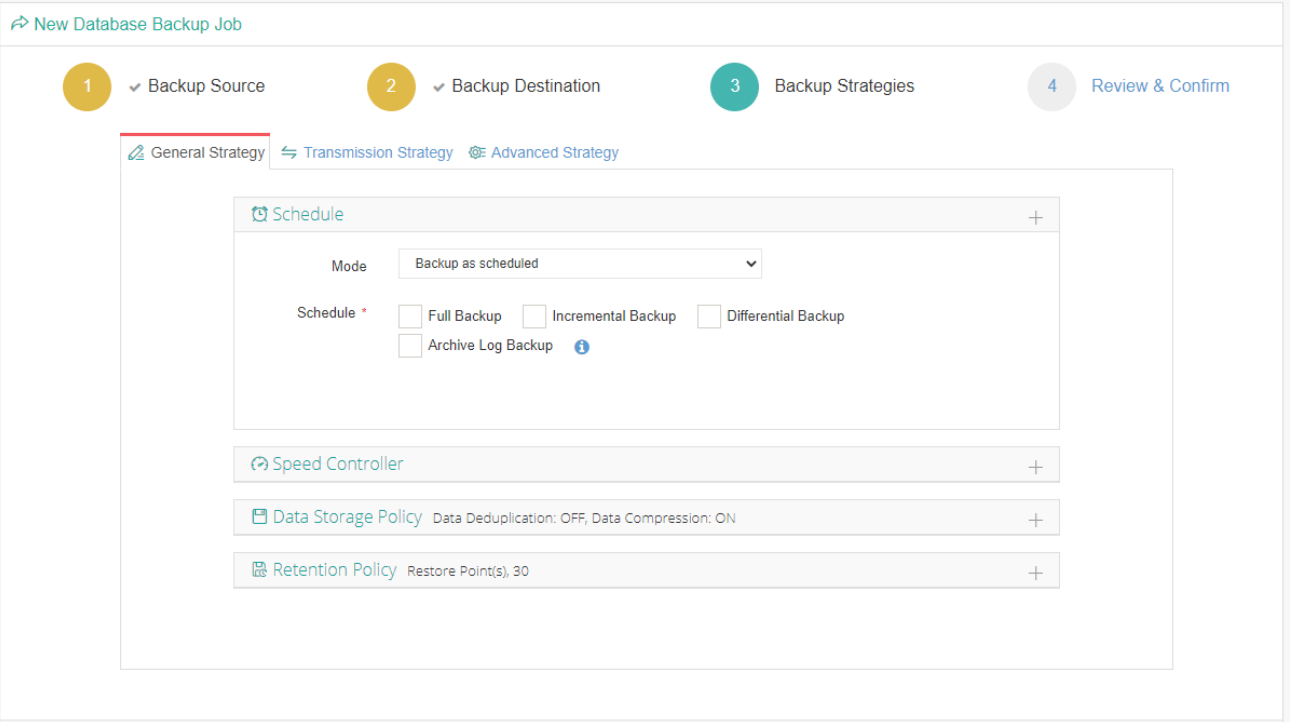


In the **Target Node** dropdown list, you can select a backup node on which you want the backup data to be processed and stored.

In the **Target Storage** dropdown list, the storages belong to the selected backup node can be selected.

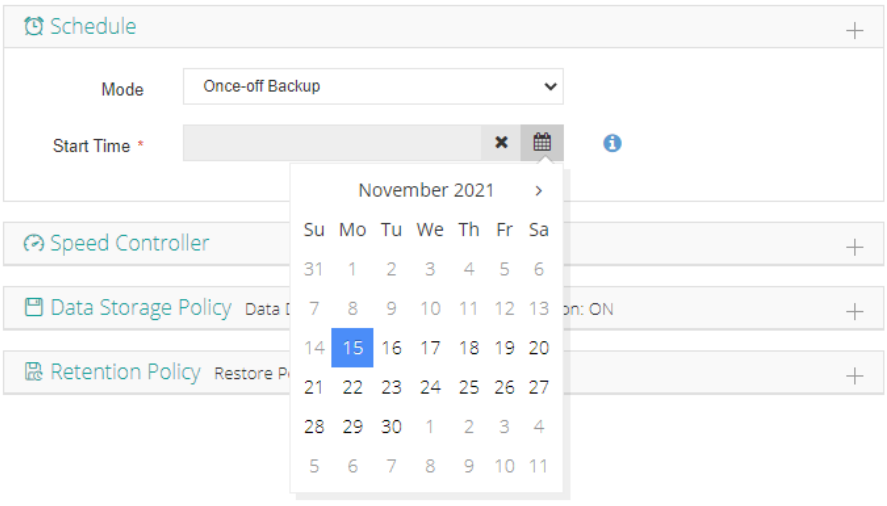
Step 3: Backup Strategies

In the General Strategy it including Schedule, Speed Controller, Data Storage Policy and Retention Policy.

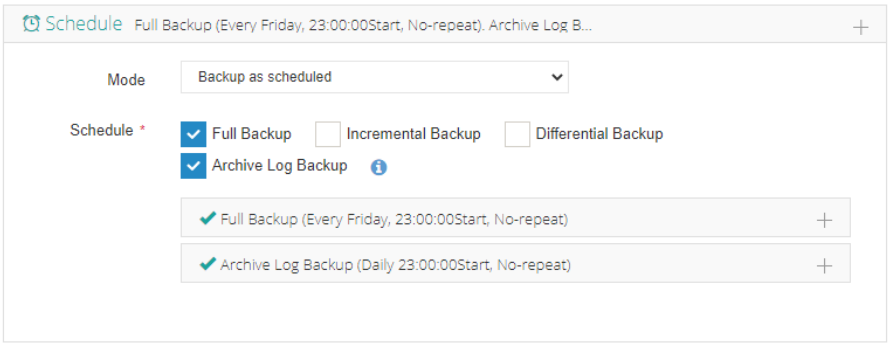


In the Schedule field, you can configure the time schedule of the backup job, you can configure the job as a **Backup as Scheduled** job or a **Once-off Backup** job.

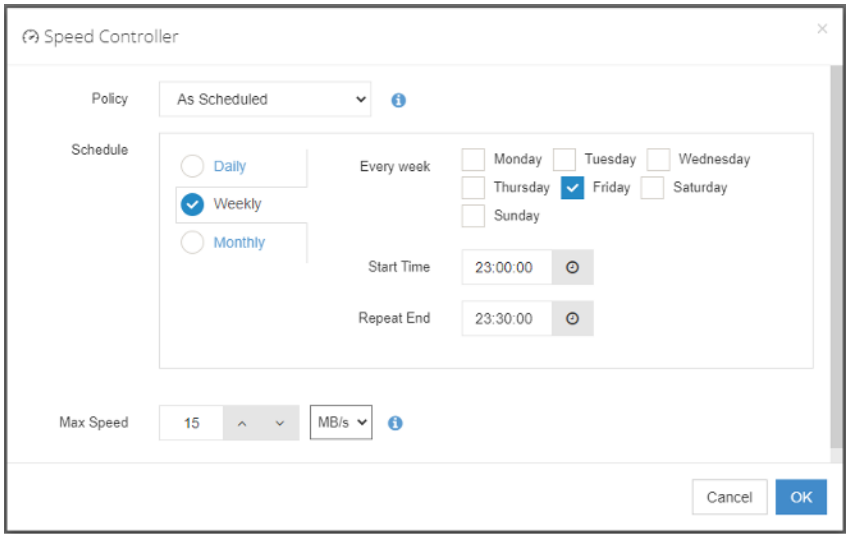
For a once-off backup job, the job will only run for once, and only full backup will be performed. You only have to appoint a time of when to start the backup job, in the Start Time field.



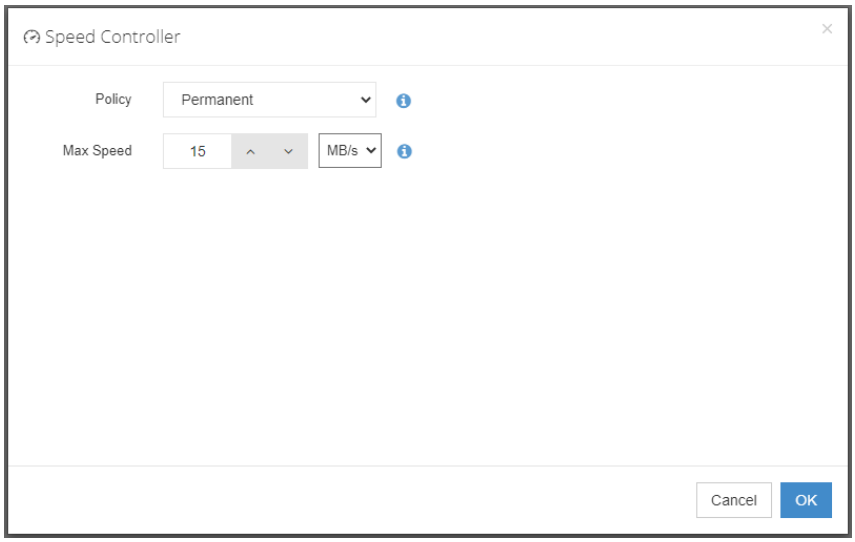
For backup job type, you can schedule Full Backup, Incremental Backup, Differential Backup and Archive Log Backup. For Oracle database must have **Full Backup** and **Archive Log Backup**. Please set the backup mode and backup schedule as per your actual demands, then please click on **Next** to continue.



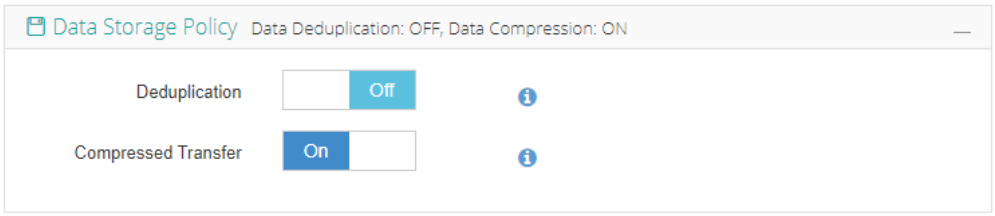
Speed Controller is optional. It can be used to limit the transmission speed during database backup if needed. The speed controller policy can be configured as either As Scheduled or Permanent. An As Scheduled policy can be configured to limit the backup speed on Daily, Weekly and Monthly basis.



A Permanent policy will always limit the backup speed within the specified Max Speed.



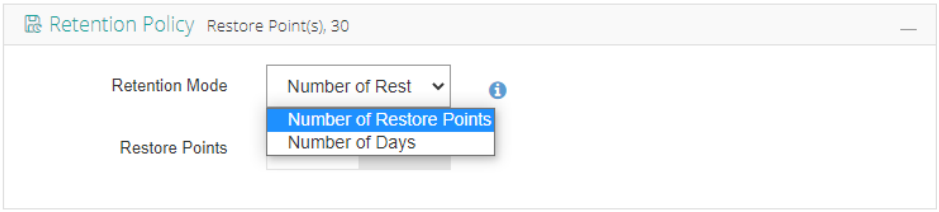
There are 2 options in Data Storage Policy section, Data Deduplication and Data Compression. By enabling these 2 options, the backup data will be deduplicated and compressed before saving into backup storage.



For the retention policy of the database backup, there are 2 retention mode, retain the database backups according to **Number of Restore Points** or **Number of Days**.

For the retention mode **Number of Restore Points**, the restore points will be counted by full restore points, including the differential backups and log backups dependent on this full backup.

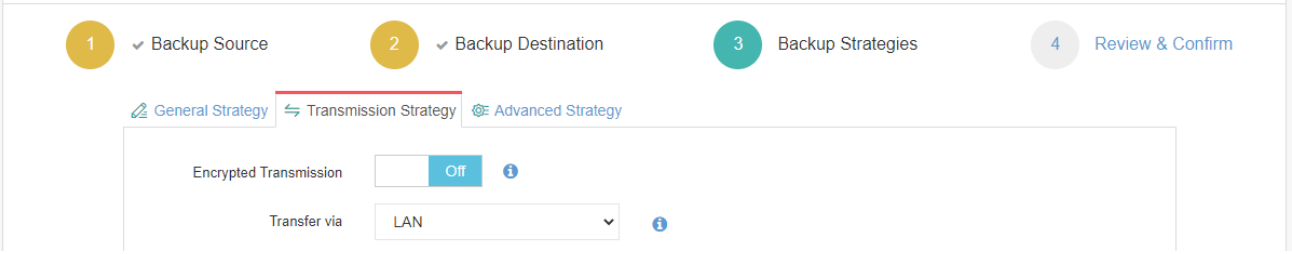
For retention mode **Number of Days**, Vinchin Backup Server will save the restore points within the specified number of days.



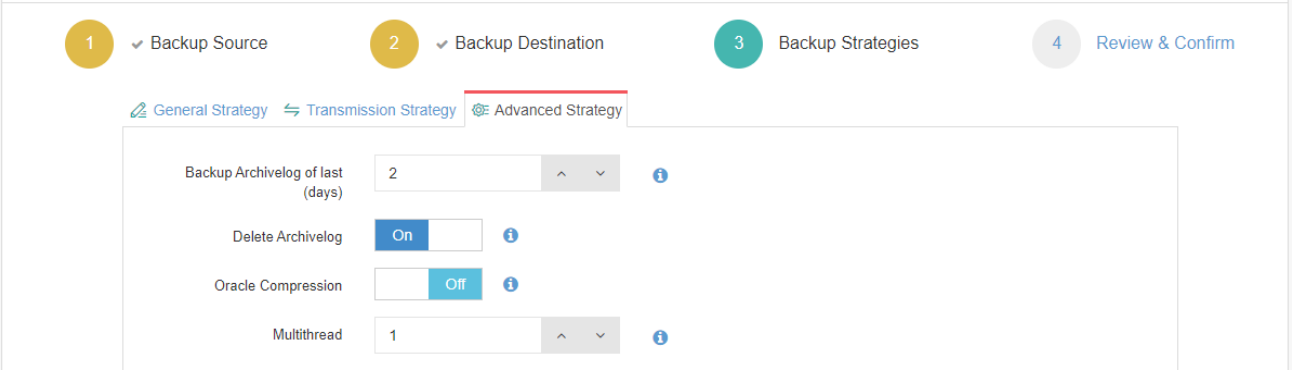
When the retention policy is triggered, the outdated restore points will be purged to comply with the retention policy.

In the transmission Strategy, you can choose to enable **Encrypted Transmission** for data safety.

The backup data will be transferred through LAN by default.



Advanced Strategy allows you to configure Backup Archivelog of last (days), Delete Archivelog, Oracle Compression and Multithreaded transmission.



Backup archivelog of last(days): The default value of the recent archivinglog days is associated with the frequency of archiving log backup set in the schedule policy. e.g. if Archive Log Backup set to Daily, default is 2 days. If Archive Log backup set to every week, default is 8 days. If Archive Log Backup set to Monthly, default is 31.

Delete Archivelog: enabled delete archivelog can delete backed up archivelog file from database server, reclaim

archive space from the database server. If disabled this option, database admin needs manually delete archivelog files.

Oracle Compression: provide by Oracle to reduce data transfer, data backup time and save backup storage, disabled by default.

Multithread: backup data will be transferred over multiple channels to improve the backup speed. The default value is 1, and the maximum value is 6.

Note

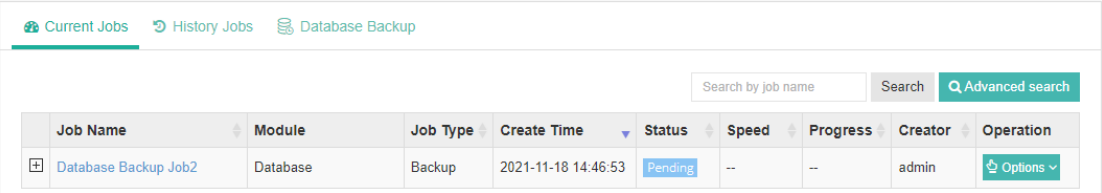
If Delete Archivelog is disabled, DBA must manually delete archivelog files regularly, otherwise, production database crash may occur once space is fulfilling with archive log files. It is recommended to enable this function.

Step 4: Review & Confirm

After completing the above-mentioned settings, you are able to review and confirm the settings in one screen.
A job name can be specified for identification of the database backup jobs, and by clicking on the Submit button to confirm the creation of the backup job.

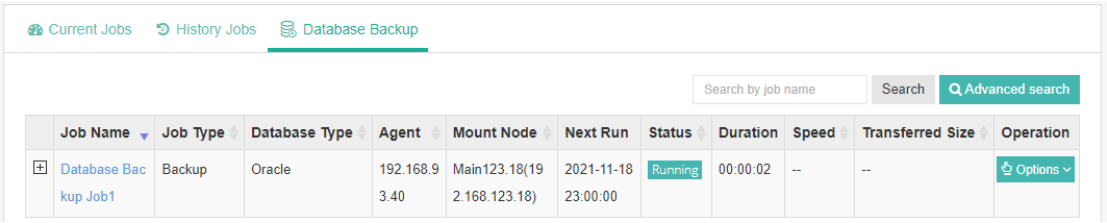
Managing Backup Job

Once a database backup job had been created, you will be redirected to the **Monitor Center** > **Jobs** page.



The status of the newly created job will usually be **Pending**, when the time condition matches the schedule, it will automatically run. And the status will change to Running, you can also see the transfer speed here within the job list.

Besides the Current Job list, there's a dedicated tab to show database backup jobs. More detailed information of database backup jobs, including database type, database agent info, backup node, next run time and some more detailed information dedicated for database backup will be given.



By clicking on the job name you can check more detailed information on the **Job Detail** page.

For a scheduled backup job, after running one of the schedules, the status will change to Pending again and then wait for the next run.

For a once-off backup job, after running the job for once, it will be removed from the Current Job list. And you can find it from the History Job list.

Before Restoring Oracle Database

Before starting to restore Oracle database, there are some configurations need DBA to check.

Target recovery database server needs database backup agent installed, and if it's Linux system, the service ports: 20200, 20300 and 20400 needs to be opened to Vinchin backup server.

Target Oracle database instance needs to be shutdown, and static listener registration needs to be configured in listener.ora file.

Archivelog mode needs to be enabled with the target Oracle database server. You can check status by login to sqlplus and using below command.

```
archivelog list;
```

Check if **Automatic archival** status is **Enabled**, if not please configure this by DBA.

Check whether the database instance can be connected by using below command. In standalone environment.

```
rman target=username/password@instancename
```

In RAC cluster, use below command.

```
rman target=username/password@publicIP:1521/instancename
```

If connection fails, the restore job will fail, please contact DBA to fix it.

If using **Override Original Database** mode, there're some prerequisites that need to be done and checked. Please carefully read the following points to avoid any errors:

1. The target Oracle database instance needs to be shutdown.

2. Static listener registration for the target database instance needs to be configured.

3. Archivelog mode needs to be enabled with the target Oracle database server.

4. When Override Original Database restores to another Oracle database server, the target server should have the same configurations as the source server, including operating system version, database version, database installation path, database instance name, database username and password.

5. When restoring to another Oracle database server, the archive logs and redo logs need to be deleted on the target server.

If **Override Original Database** restore to another database server, it requires the target database server configurations should be the same as the source database server, including operating system, database version, installation path and instance name. Please be careful to use override original database function.

If **Restore to New Path**, the database path will be automatically changed to the new path specified during the restore process. After restoration, DBA can just start the database services directly from the new path.

If **Restore Exported Directory**, it quires to be manually restored from the exported directory after some configuration in Oracle instance. Detailed operation can refer to Restore Exported Directory section.

Notice

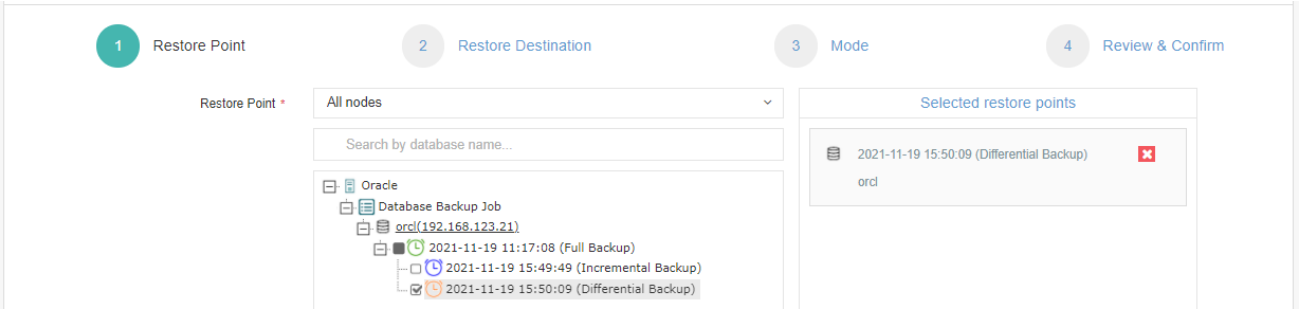
Restore to New Path does not work with Oracle RAC, because the database path will only change on the RAC node which the restore job is associated to, other nodes will not be changed. If you use Restore to New Path with Oracle RAC, it will cause Oracle RAC exception!

Create Oracle Restore Job

To restore databases from database backup restore points, please go to **Physical Backup** > **Database Backup** > **Restore** page. There are 4 steps to restore databases from the database backup restore points.

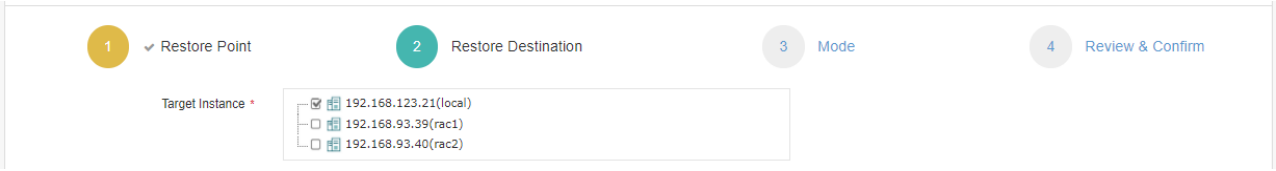
Step 1: Restore Point

In the Restore Point dropdown list, select a backup node which stores the desired restore points.
Select a target database restore point under your database which you want to restore. You can quickly find the target restore point by searching the job name, database name or the date of the restore point. One restore job only can select one restore point.



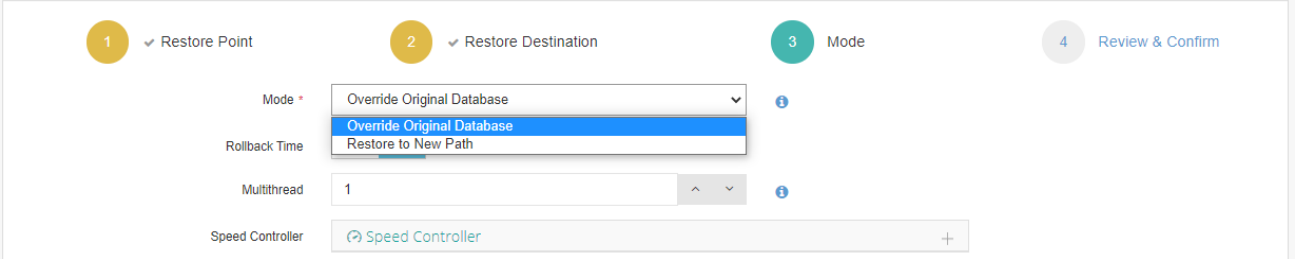
Step 2: Restore Destination

After selecting restore point, select **Target Instance** which you wish to restore.

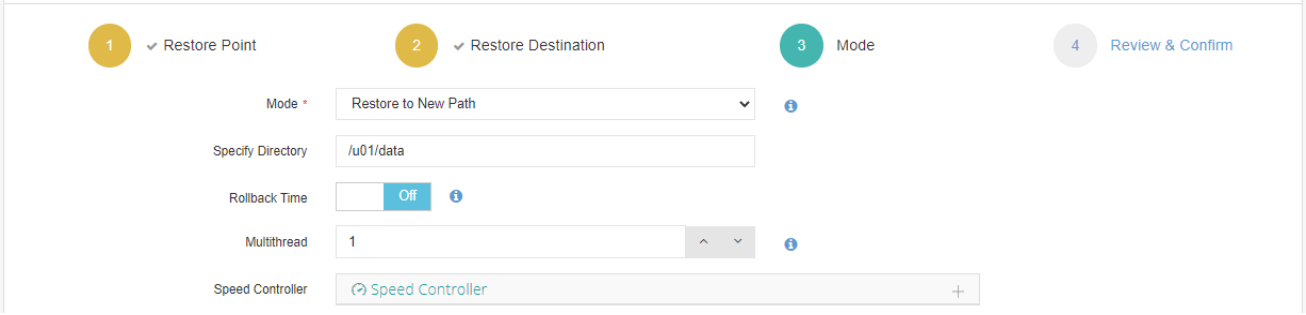


Step 3: Restore Strategy

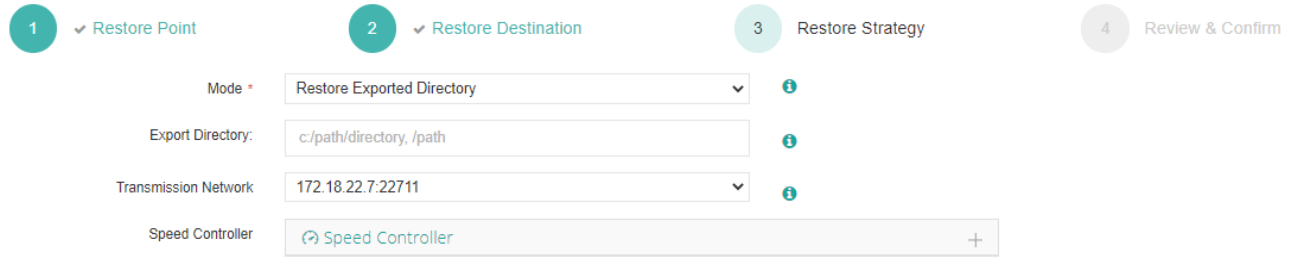
Mode: Override Original Database, Restore to New Path, Restore Exported Directory
Override Original Database applies to restore the data to the production database server. Override the data of the original database instance.



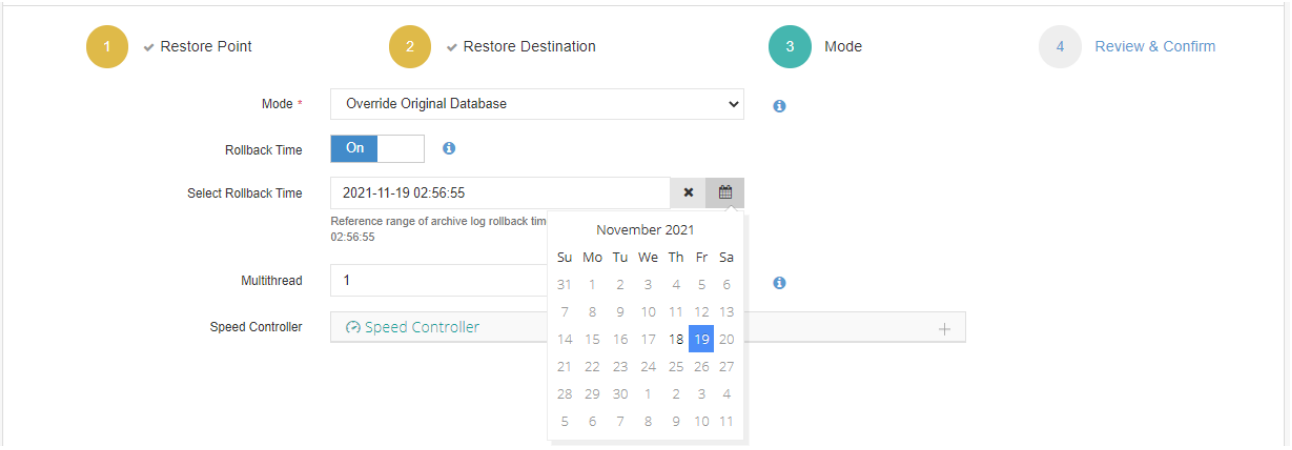
Restore to New Path applies to restore data to a new directory. The directory needs to be created by the Oracle database installation user, do not use a directory which does not exist.



Restore Exported Directory applies to manually restore the data, and alter the instance to the original one in the backup data.



Rollback Time: if you had selected archive log backup restore point, you are able to rollback Oracle database state within the given time range.



If you disable rollback time it will by default restore to the latest time point of when the backup has been taken.

Multithread: backup data will be transferred over multiple channels to improve the restore speed. The default value is 1, and the maximum value is 6.

Speed Controller: Same as database backup, while restoring databases, you can also configure speed controller to limit the database restore speed accordingly.

Step 4: Review & Confirm

After completing the above-mentioned settings, you are able to review and confirm the settings in one screen.

Once the job has been created, you'll be redirected to the **Monitor Center** > **Jobs** page.

As the database restore job is by default to be executed right after the creation of the job, so it will run automatically,

when you see it in the current job list, it should be in running status already, and once completed, the job will be automatically deleted from the current job list.
After this you can browse the restored job from History Jobs. Your restored data will be found in the path you select.

Restore Exported Directory

Restore configuration file 'pfile'

If you need to modify the configuration file, please first modify the 'pfile' file in the exported directory before proceeding with the recovery. The exported directory configured for this recovery task is '/u01/data'.
Use 'sqlplus' to access and shutdown the database:

```
sqlplus / as sysdba
shutdown immediate;
create spfile from pfile='/u01/data/pfile.file';
```

```
[oracle@localhost data]$ sqlplus / as sysdba

SQL*Plus: Release 12.2.0.1.0 Production on Mon Dec 19 17:32:30 2022

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SQL> shutdown immediate;
Database closed.
Database dismounted.
ORACLE instance shut down.
```

```
SQL> create spfile from pfile='/u01/data/pfile.file';

File created.
```

Restore control file 'controlfile'

Use 'sqlplus' to set the database to 'nomount' status:

```
startup nomount;
quit
rman target /
```

```
SQL> startup nomount;
ORACLE instance started.

Total System Global Area 3690987520 bytes
Fixed Size                  8799272 bytes
Variable Size             855641048 bytes
Database Buffers         2818572288 bytes
Redo Buffers                7974912 bytes
SQL> quit
Disconnected from Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production
[oracle@localhost data]$ rman target /

Recovery Manager: Release 12.2.0.1.0 - Production on Mon Dec 19 17:39:53 2022

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connected to target database: ORCL (not mounted)

RMAN>
```

Note whether this instance is the instance you want to restore. If not, please specify the target instance name to connect.

```
restore controlfile from '/u01/data/control.file';
```

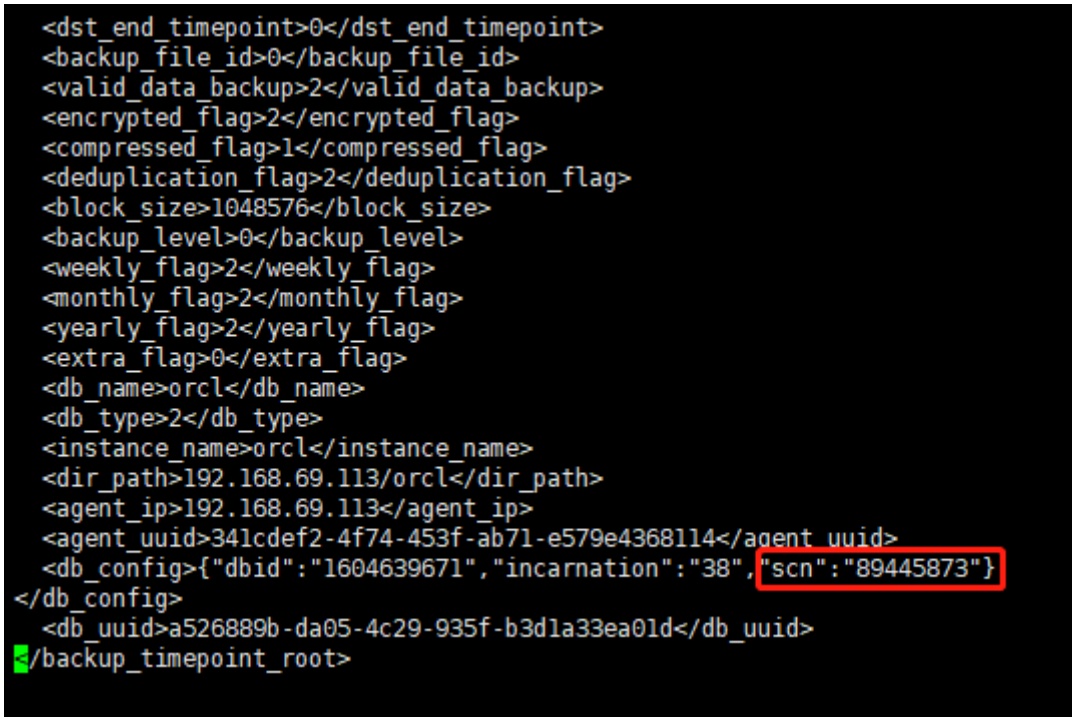
Then set the database to 'mount' status.

```
startup mount;
```

```
RMAN> restore controlfile from '/u01/data/control.file';

Starting restore at 19-DEC-22
using target database control file instead of recovery catalog
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=135 device type=DISK

channel ORA_DISK_1: restoring control file
channel ORA_DISK_1: restore complete, elapsed time: 00:00:04
output file name=/u01/app/oracle/oradata/orcl/control01.ctl
output file name=/u01/app/oracle/oradata/orcl/control02.ctl
Finished restore at 19-DEC-22

RMAN> startup mount;

database is already started
database mounted
released channel: ORA_DISK_1

RMAN>
```

Restore the data

Check the 'seledescription.xml' in the exported file, get the scn number '89445873'.



Quit the 'rman' command and re-access 'rman' command. Check whether the DBID is same with the DBID in self-description file. If not same, need to shutdown the database and set it to 'nomount' status, then execute 'set DBID 89445873;' command to setup it.

Setup the incarnation

```
reset database to incarnation 38;
```

Then execute the following command:

```
run{
allocate channel c0 type 'sbt_tape' format 'db_piece_%U' send
'local_recovery,/u01/data,/opt/vinchin/agent';
set until scn 89445873;
restore database;
recover database;
release channel c0;
}
```

The command explained as follows:

```
allocate channel c0 type 'sbt_tape' format 'db_piece_%U' send
'local_recovery,/u01/data,/opt/vinchin/agent';
```

'u01/data' is the exported directory;

'opt/vinchin/agent' is the installation directory of the Vinchin agent;

'set until scn 89445873;' is used for setup the scn number same with the scn in self-description file.

```
[oracle@localhost data]$ rman target /

Recovery Manager: Release 12.2.0.1.0 - Production on Mon Dec 19 17:50:59 2022

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connected to target database: ORCL (DBID=1604639671, not open)

RMAN> run{
allocate channel c0 type 'sbt_tape' format 'db_piece_%U' send 'local_recovery,/u01/data,/opt/vinchin/agent';
set until scn 89445873;
restore database;
recover database;
release channel c0;
}
2> 3> 4> 5> 6> 7>
using target database control file instead of recovery catalog
allocated channel: c0
channel c0: SID=390 device type=SBT_TAPE
channel c0: SBT By Vinchin Technology

executing command: SET until clause
```

Note

If there is an error as 'rman06054', do not need to deal with it. Just startup the database directly.

```
channel c0: starting incremental datafile backup set restore
channel c0: specifying datafile(s) to restore from backup set
destination for restore of datafile 00001: /u01/app/oracle/oradata/orcl/system01.dbf
destination for restore of datafile 00003: /u01/app/oracle/oradata/orcl/sysaux01.dbf
destination for restore of datafile 00004: /u01/app/oracle/oradata/orcl/undotbs01.dbf
destination for restore of datafile 00007: /u01/app/oracle/oradata/orcl/users01.dbf
channel c0: reading from backup piece db_piece_7t1eptud_1_1
channel c0: piece handle=db_piece_7t1eptud_1_1 tag=TAG20221207T160947
channel c0: restored backup piece 1
channel c0: restore complete, elapsed time: 00:00:15

starting media recovery

channel c0: starting archived log restore to default destination
channel c0: restoring archived log
archived log thread=1 sequence=931
channel c0: reading from backup piece db_piece_801eptvp_1_1
channel c0: piece handle=db_piece_801eptvp_1_1 tag=VINCHIN20221207160800
channel c0: restored backup piece 1
channel c0: restore complete, elapsed time: 00:00:01
archived log file name=/u01/app/oracle/product/12.2.0/dbhome_1/dbs/arch1_931_1114187496.dbf thread=1 sequence=931
unable to find archived log
archived log thread=1 sequence=932
released channel: c0
RMAN-00571: ===========================================================
RMAN-00569: =============== ERROR MESSAGE STACK FOLLOWS ===============
RMAN-00571: ===========================================================
RMAN-03002: failure of recover command at 12/08/2022 14:33:17
RMAN-06054: media recovery requesting unknown archived log for thread 1 with sequence 932 and starting SCN of 85234408


Recovery Manager complete.
[oracle@localhost dbs]$
```

Use 'sqlplus' to startup the database

```
quit
sqlplus / as sysdba
alter database open resetlogs;
```

```
RMAN> quit


Recovery Manager complete.
[oracle@localhost data]$ sqlplus / as sysdba

SQL*Plus: Release 12.2.0.1.0 Production on Mon Dec 19 17:58:47 2022

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Oracle Database 12c Enterprise Edition Release 12.2.0.1.0 - 64bit Production

SQL> alter database open resetlogs;


Database altered.
```
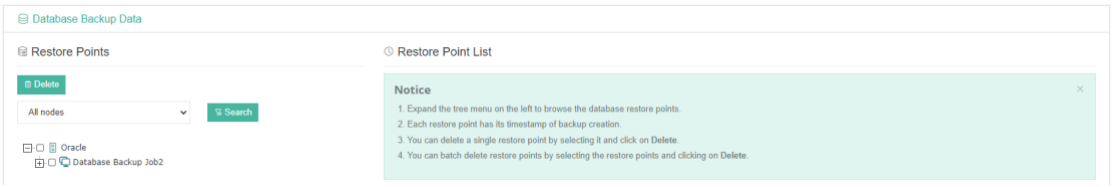

Now the recovery has finished and can use the original database in the exported files.

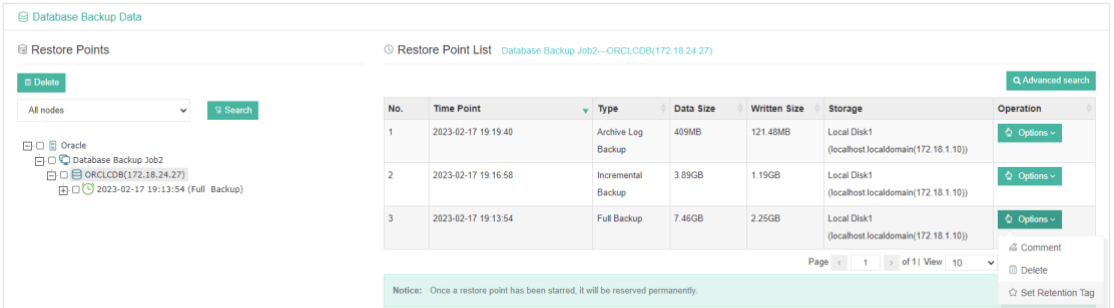
Managing Backup Data

The database backup data can be managed from **Physical Backup** > **Database Backup** > **Backup Data** page.



If you want to delete a restore point or multiple restore points, you can first select target restore point(s) from the left tree view, and click on the **Delete** button. The incremental, differential and log backup cannot be deleted individually, they will be deleted along with the dependent full backup.

When deleting backup data, you need to provide your login password to confirm the deletion, once deleted the data will be unrecoverable.



For the restore point list in the right column, you need to select a database in the left tree menu to view all restore points of the selected database. Information like backup type, data size, written backup size and storage will be given.

You can add comments to the full backups, incremental backups, differential backups and the log backups, and set retention tags for the full restore point to keep the full backup and its dependent incremental, differential and log backups to not be deleted by retention policy.

A full restore point can be also deleted from the Restore Point List by clicking on Options and then select Delete, the dependent incremental, differential and log backups will be deleted along with the full restore point.