Quick Start for HVR - Ingres

Contents

This quick start guide helps you to get started with HVR for replicating data between Ingres databases.

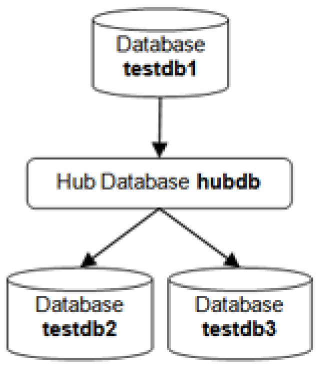
To proceed with this replication you must have basic understanding about HVR's architecture and terminologies like Hub, Location, Channel, Location Groups, Actions etc.

The example here demonstrates how to replicate tables from one Ingres database (source location) to another two Ingres databases (target location).

In real-life scenarios, the source location(s) and the target location(s) reside on different machines and the HVR hub can reside on source or target or a separate machine. However, in this example, for simplicity we have the source, target, and HVR hub database on the same machine.

Before proceeding with this example ensure that the requirements for using HVR with Ingres are met.

For information about access privileges and advanced configuration changes required for performing replication using Ingres, see Requirements for Ingres and Vector.



Create Test Databases and Tables

Create three test databases, each containing two empty tables named **dm01_product** and **dm01_order**. If replication is configured between existing databases and tables then this step should be skipped.

```
$ createdb testdb1
$ createdb testdb2
$ createdb testdb3

$ cd $HVR_HOME/demo/hvr_demo01/base/ingres
$ sql testdb1 < hvr_demo01.cre
$ sql testdb1 < hvr_demo01.mod
$ sql testdb2 < hvr_demo01.cre
$ sql testdb2 < hvr_demo01.mod
$ sql testdb3 < hvr_demo01.cre
$ sql testdb3 < hvr_demo01.mod

$ ckpdb +j testdb1
```

The last command (to checkpoint the source database) is needed so that if HVR log–based capture cannot find a change anymore in the Ingres log file it can always look into the Ingres journal files.

Create the Hub Database

Create the hub database, in which the HVR GUI will store the channel definition.

```
$ createdb hvrhub
```

Download and Install HVR

An HVR distribution is available for download at https://www.hvr-software.com/account/. To request a trial version, visit https://www.hvr-software.com/free-trial/.

Install HVR on a hub machine. For details on installing HVR, see the respective operating system sections:

- Installing HVR on UNIX or Linux
- Installing HVR on Windows
- Installing HVR on macOS

The HVR distribution requires a license key in order for the software to operate. Please see the HVR licensing page for more details on how to install the HVR license.

After the installation, you can control HVR using the HVR graphical user interface (**HVR GUI**).

- If the hub machine is Windows, then **HVR GUI** can be executed directly on the hub machine.
  - To control HVR remotely from your PC, connect to the hub machine using Windows Remote Desktop Connection and launch **HVR GUI** on the hub machine.
- If the hub machine is Linux, then **HVR GUI** can be executed directly on the hub machine. However, an application like X Server or VNC viewer must be installed to run **HVR GUI** directly on Linux.
  - To control HVR remotely from your PC, install HVR on the PC (with Windows or macOS) and configure the **HVR Remote Listener** on the hub machine.
- If the hub machine is Unix, then **HVR GUI** should typically be run remotely from a PC to control HVR installed on the hub machine. To do this, install HVR on the PC (with Windows or macOS) and configure the **HVR Remote Listener** on the hub machine.

The **HVR Remote Listener** allows you to connect **HVR GUI** available on your PC to the remote HVR hub machine. For more information about connecting to remote HVR installation, see Configuring Remote Installation of HVR on Unix or Linux and Configuring Remote Installation of HVR on Windows.

Launch HVR GUI

This section describes how to launch **HVR GUI** on various operating systems.

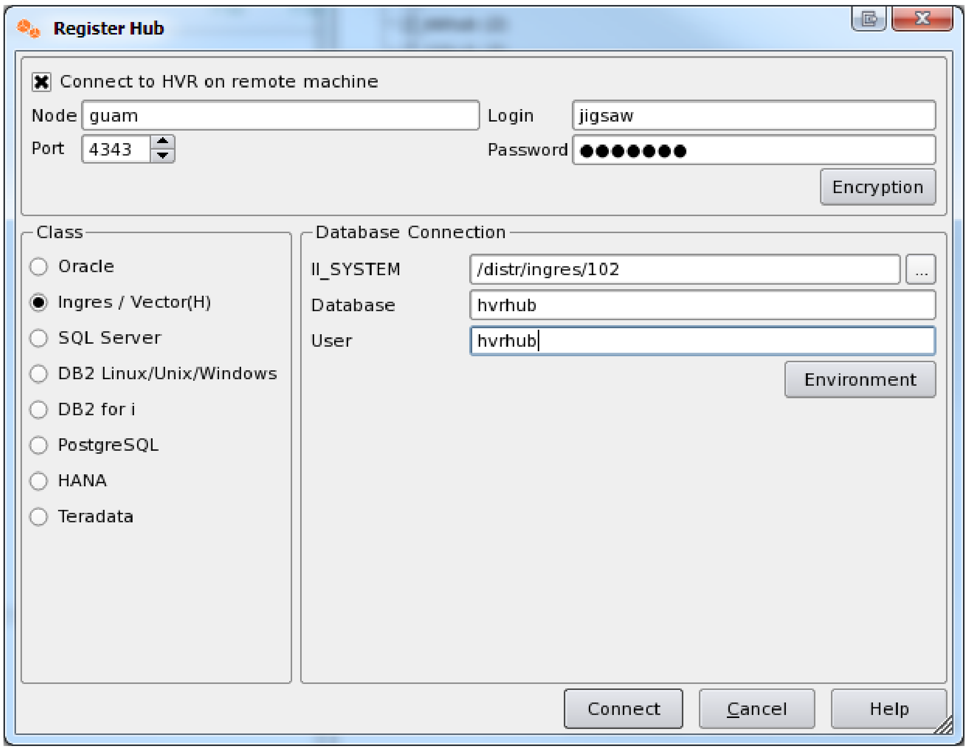
- On Windows and macOS, double-click the HVR shortcut icon available on the desktop or execute command **hvrgui** in the CLI.
- On Linux, double-click the hvrgui file available in the HVR_extracted_path/bin directory or execute command **hvrgui** in the CLI.

  Linux requires applications like X server or VNC viewer to execute **HVR GUI**.
- On Unix, **HVR GUI** is not supported. So, **HVR GUI** should be run on a remote PC (with Windows, Linux, or macOS) to control HVR installed on the Unix machine.

Register Hub

This section describes how to connect **HVR GUI** to the hub database.

1. First, register the hub database: right-click on **hub machines Register hub**.
2. Enter connection details.



[✓ Connect to HVR on remote machine]

Node	guam	Login	jigsaw
Port	4343	Password	●●●●●●●

Class: Oracle [✓ Ingres / Vector(H)] SQL Server DB2 Linux/Unix/Windows DB2 for i PostgreSQL HANA Teradata

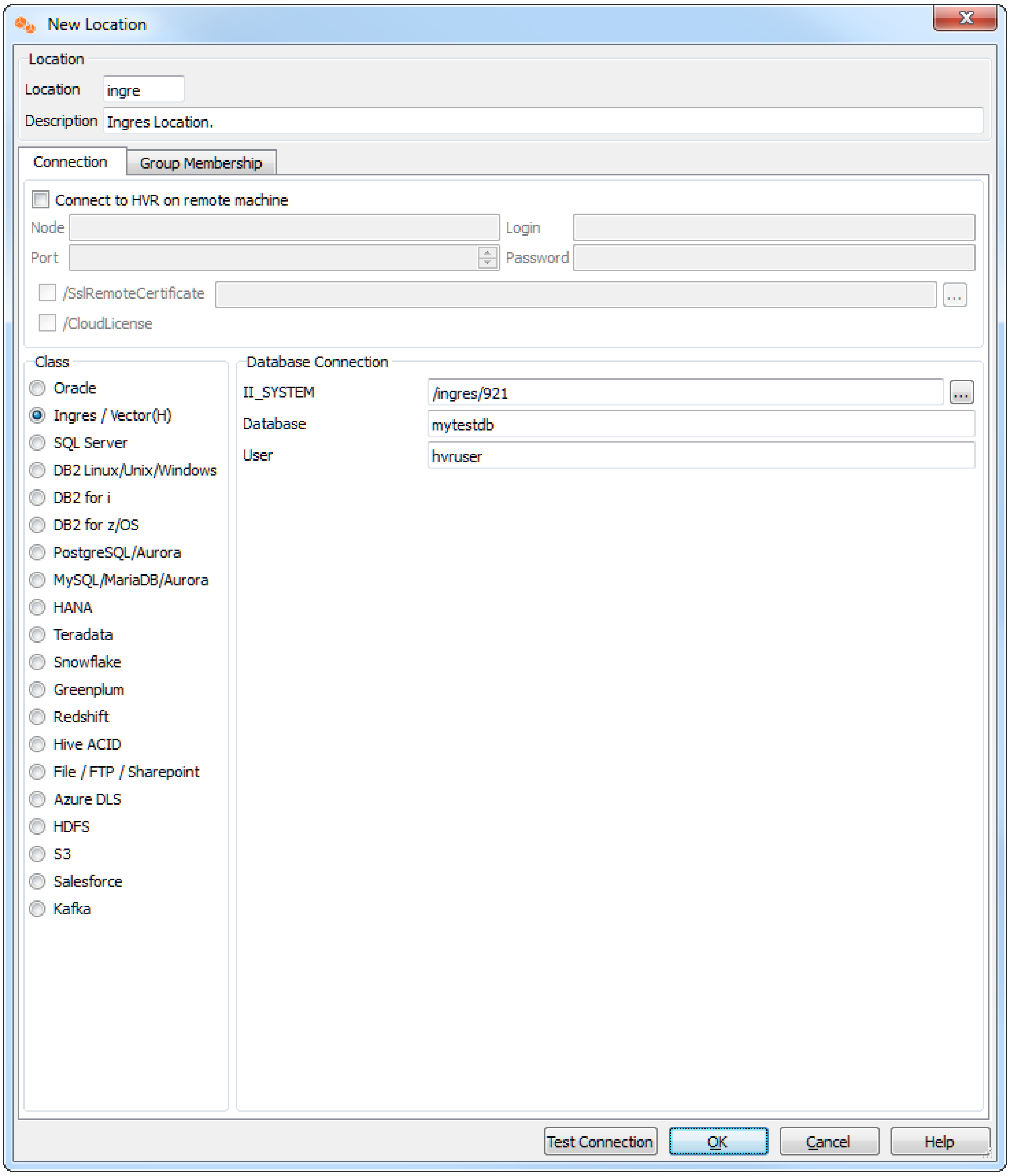
II_SYSTEM	/distr/ingres/102
Database	hvrhub
User	hvrhub

In this example the hub is a machine called **guam**, where an INET daemon is listening on port 4343. See section Installing HVR on Unix or Linux for how to configure this.

For a new hub database a dialog will prompt **Do you wish to create the catalogs?**; answer **Yes**.

Create Locations

Next create three locations (one for each test database) using right-click on **Location Configuration New Location**.



In this example there is no need to check **Connect to HVR on remote machine** because **testdb1** is on the same machine as the hub.

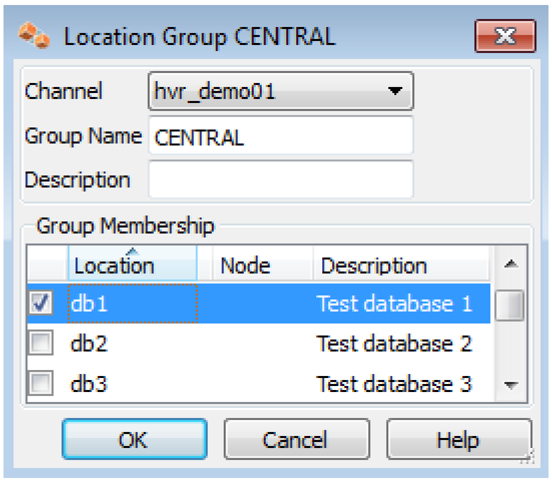
Ignore the **Group Membership** tab for now.

Make locations for **testdb2** and **testdb3** too.

Now define a channel using **Channel Definitions New Channel**.

Create Location Groups

The channel needs two location groups. Under the new channel, right-click **Location Groups New Group**. Enter a group name (for instance **CENTRAL**).



Channel: hvr_demo01
Group Name: CENTRAL
Description:

	Location	Node	Description
✓	db1		Test database 1
☐	db2		Test database 2
☐	db3		Test database 3

Add location **db1** as a member of this group by checking the box for **db1**.

Then create a second location group, called **DECENTRAL** that has members **db2** and **db3**.

The new channel also needs a list of tables to replicate. This can be done as follows: right-click **Tables Table Explore**.

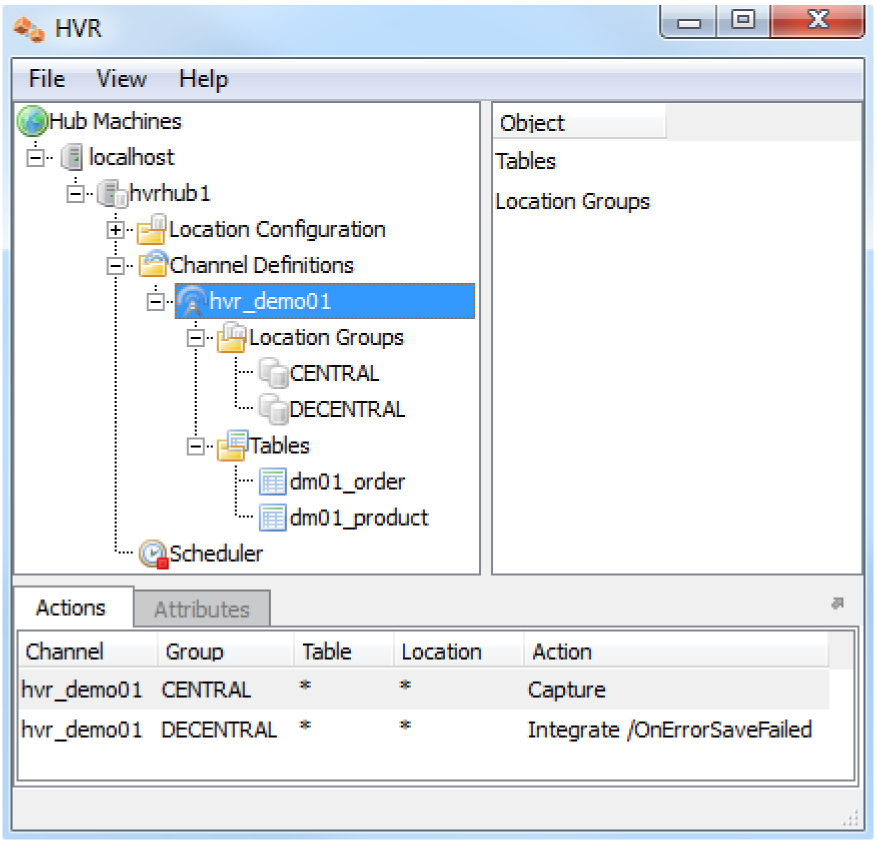
- Choose the first of the three locations **Connect**.
- In the **Table Explore** window, click on both tables and click **Add**.
- In new dialog **HVR Table Name** click **OK**.
- Close the **Table Explore** window.
- Perform table select again on one of the other locations and confirm that all tables to be replicated have value **Same** in column **Match**.

Define Actions

The new channel needs two actions to indicate the direction of replication.

- Right-click group **CENTRAL New Action Capture**.

- Right-click **Group DECENTRAL New Action Integrate**. Check **/OnErrorSaveFailed**, this affects how replication errors are handled.



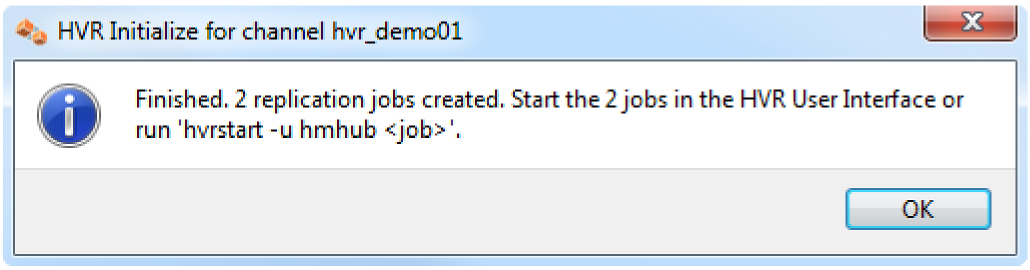
Channel	Group	Table	Location	Action
hvr_demo01	CENTRAL	*	*	Capture
hvr_demo01	DECENTRAL	*	*	Integrate /OnErrorSaveFailed

Note that the **Actions** pane only displays actions related to the objects selected in the left-hand pane. So click channel **hvr_demo01** to see both actions.

Initialize

Now that the channel definition is complete, create the runtime replication system.

1. Right-click channel **hvr_demo01 HVR Initialize**.
2. Choose **Create or Replace Objects** and click **HVR Initialize**.



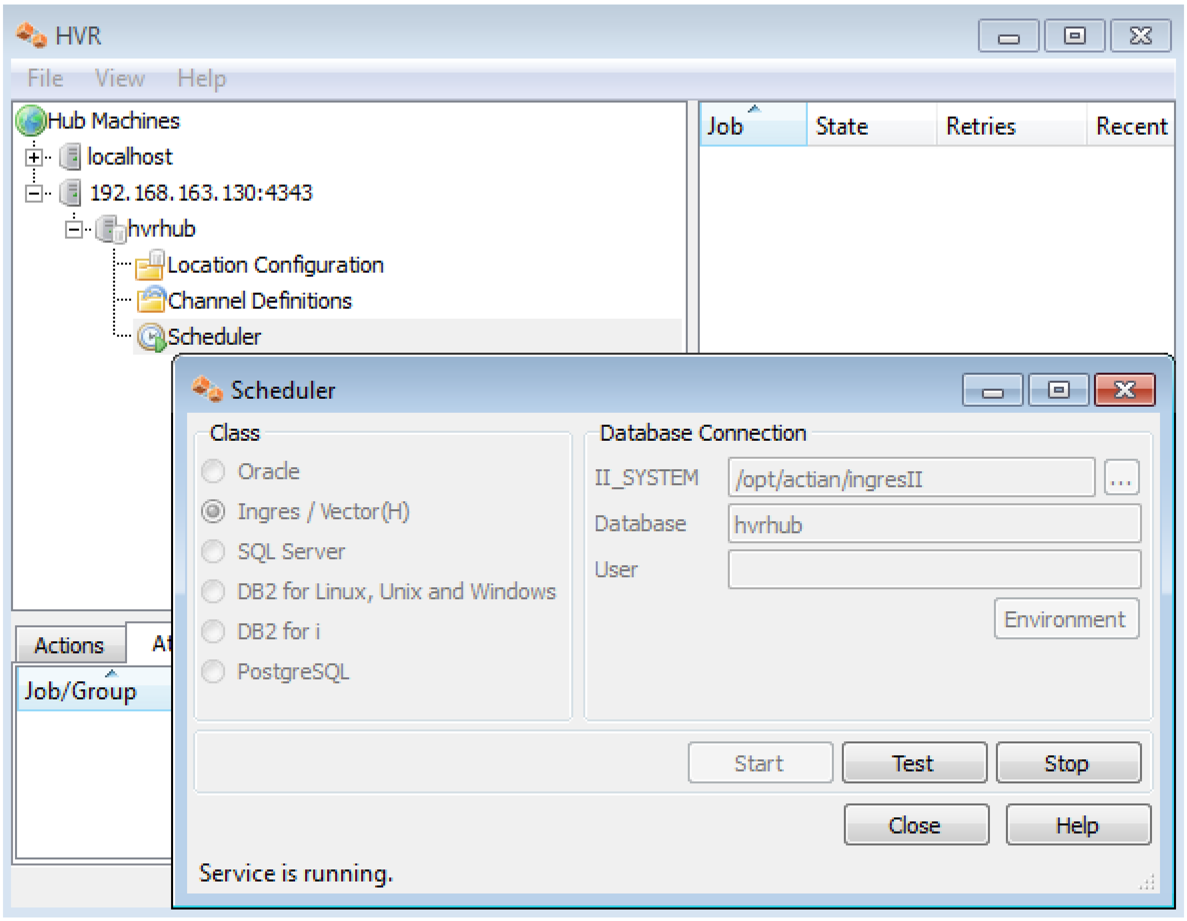
Finished. 2 replication jobs created. Start the 2 jobs in the HVR User Interface or run 'hvrstart -u hmhub <job>'.

From the moment that HVR Initialize is done, all changes to database **sourcedb** will be captured by HVR when its capture job looks inside the logging.

HVR initialize also creates three replication jobs, which can be seen under the **Scheduler** node in the GUI.

Start Scheduling of Replication Jobs

Start the Scheduler on the hub machine by clicking in the HVR GUI on the **Scheduler** node of the hub database.

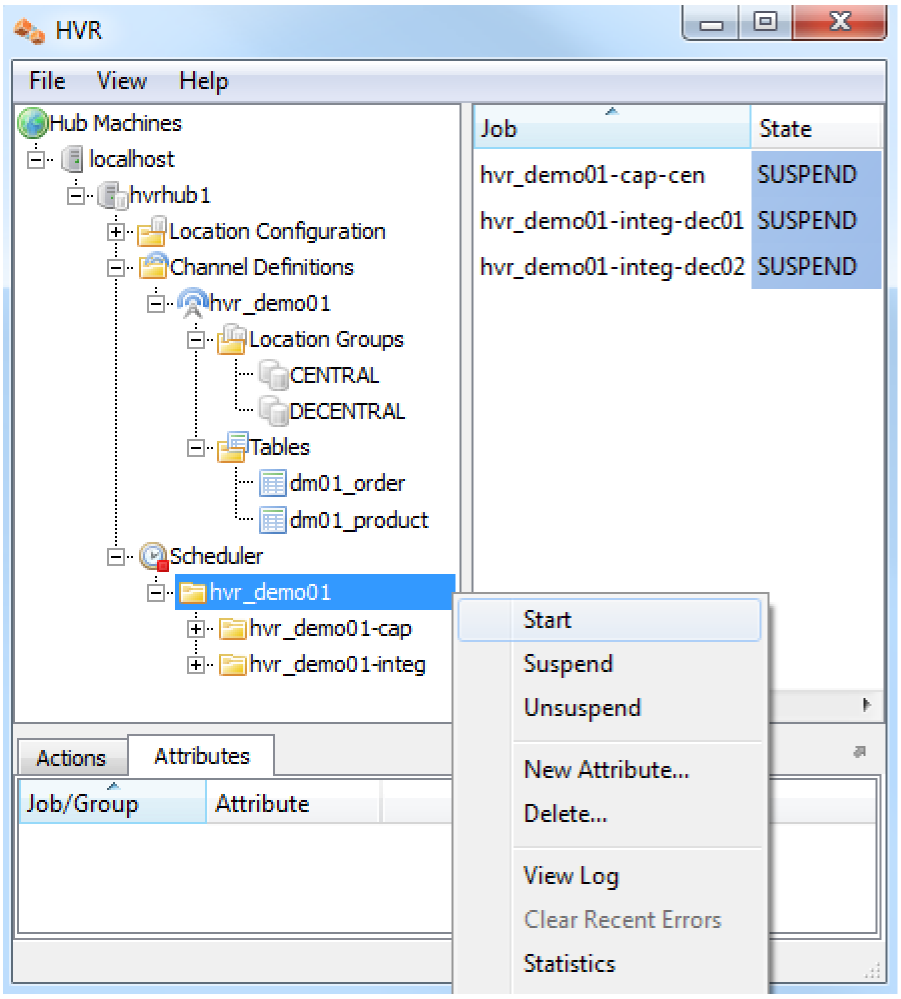


Class: Oracle [✓ Ingres / Vector(H)] SQL Server DB2 for Linux, Unix and Windows DB2 for i PostgreSQL

II_SYSTEM	/opt/actian/ingresII
Database	hvrhub
User	

Service is running.

Next, instruct the HVR Scheduler to trigger the replication jobs.
The replication jobs inside the Scheduler each execute a script under **$HVR_CONFIG/job/hvrhub /hvr_demo01** that has the same name as the job. So job **hvr_demo01–cap–db1** detects changes on database **testdb1** and stores these as transactions files on the hub machine.



Job	State
hvr_demo01-cap-cen	SUSPEND
hvr_demo01-integ-dec01	SUSPEND
hvr_demo01-integ-dec02	SUSPEND

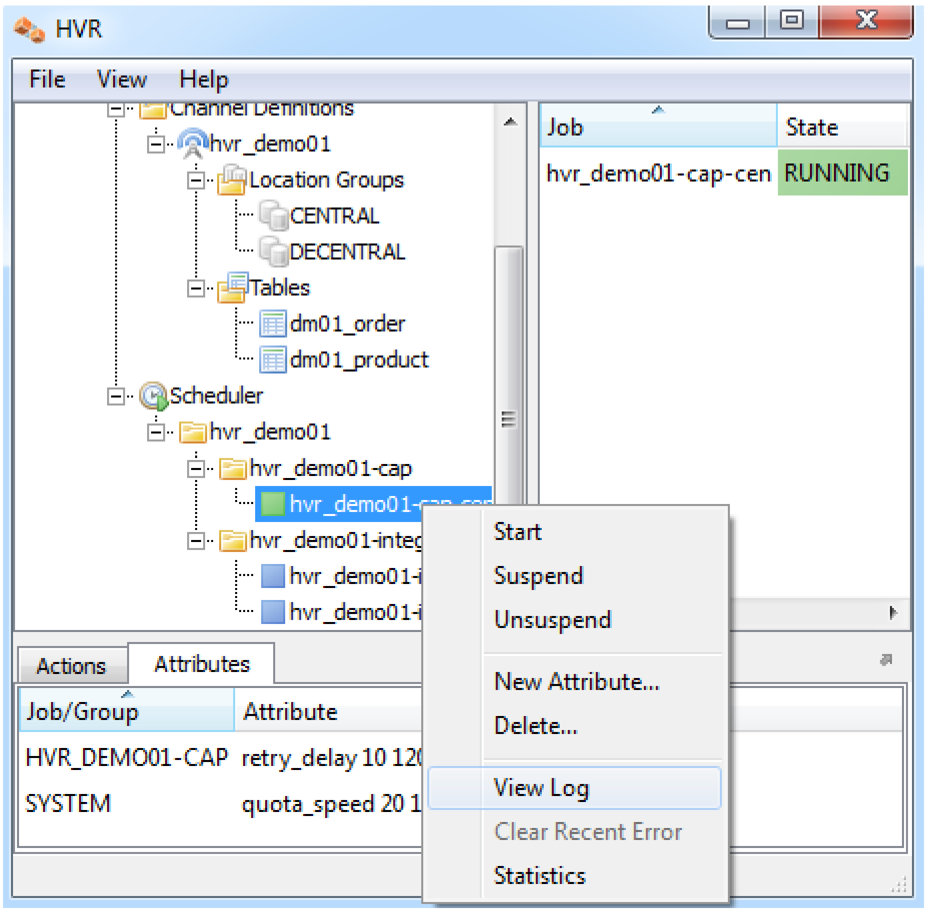
The other two jobs (**hvr_demo01–integ–db2** and **hvr_demo01–integ–db3**) pick up these transaction files and perform inserts, updates and deletes on the two target database.

Test Replication

To test replication, make a change in **testdb1**:

```
testdb1/hvr
SQL> insert into dm01_product values (1, 19.99, 'DVD');
SQL> commit;
```

In the HVR log file you can see the output of the jobs by clicking on **View Log**. This log file can be found in **$HVR_CONFIG/log/***hubdb***/hvr_demo01–cap–db1**.



Job	State
hvr_demo01-cap-cen	RUNNING

Job/Group	Attribute
HVR_DEMO01-CAP	retry_delay 10 120
SYSTEM	quota_speed 20 1

The job output looks like this:

```
 hvr_demo01-cap-db1: Scanned 1 transaction containing 1 row (1 ins) for 1
table.
 hvr_demo01-cap-db1: Routed 215 bytes (compression=40.6%) from 'db1' into 2
locations.
 hvr_demo01-cap-db1: Capture cycle 3.
 hvr_demo01-integ-db2: Integrate cycle 2 for 1 transaction file (215 bytes).
 hvr_demo01-integ-db2: Integrated 1 change from 'dm01_product' (1 ins).
 hvr_demo01-integ-db2: Integrate used 1 transaction and took 0.004 seconds.
 hvr_demo01-integ-db3: Integrate cycle 2 for 1 transaction file (215 bytes).
 hvr_demo01-integ-db3: Integrated 1 change from 'dm01_product' (1 ins).
 hvr_demo01-integ-db3: Integrate used 1 transaction and took 0.013 seconds.
 hvr_demo01-integ-db3: Waiting...
```

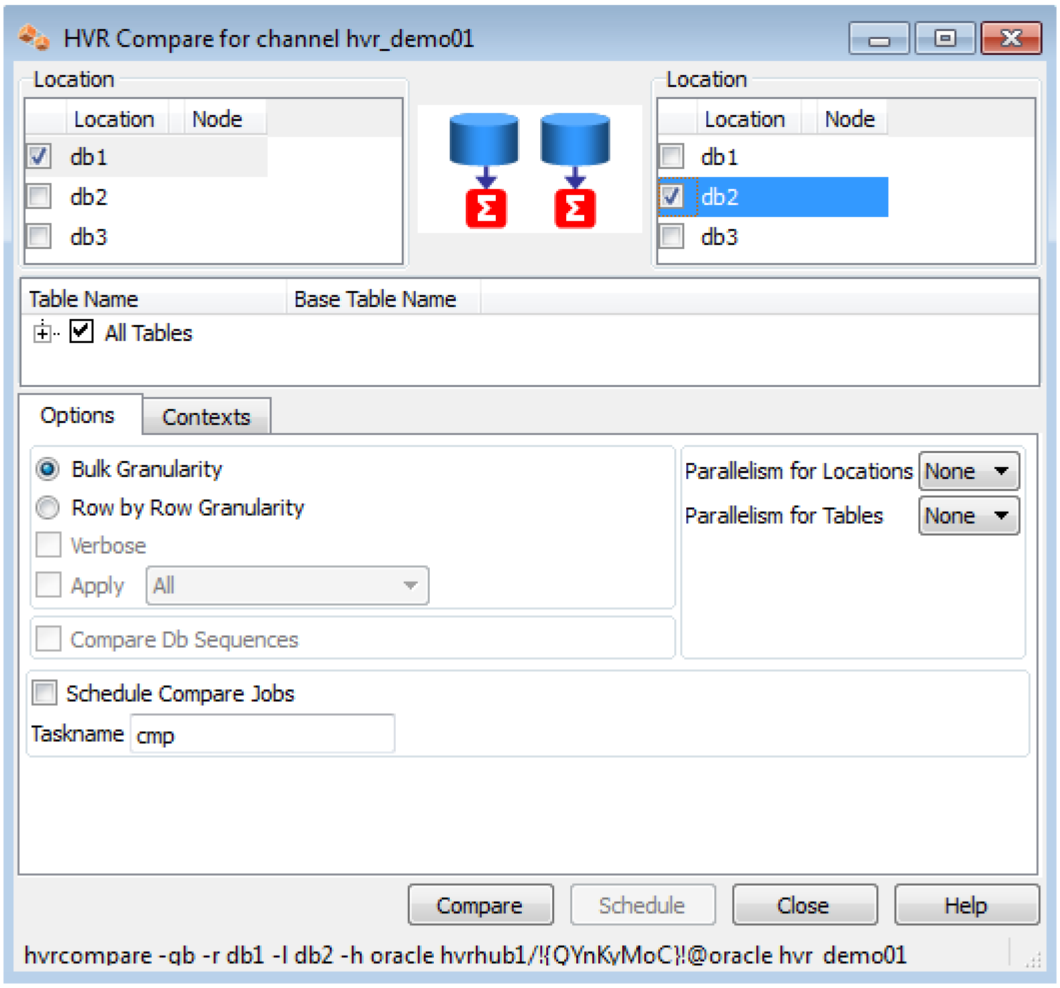
This indicates that the jobs replicated the original change to **testdb2** and **testdb3**. A query on **testdb2** confirms this:

```
testdb2/hvr
SQL> select * from dm01_product;
```

prod_id	prod_price	prod_descrip
1	19.99	DVD

HVR Compare and Refresh

HVR Compare checks whether two locations have identical rows, and HVR Refresh copies the content of one location to the second location. In the HVR GUI, right-click on a channel and select **HVR Compare** (or **HVR Refresh**). Choose source and target locations.



HVR Compare for channel hvr_demo01

Location	Node
✓ db1	
db2	
db3	

Location	Node
db1	
✓ db2	
db3	

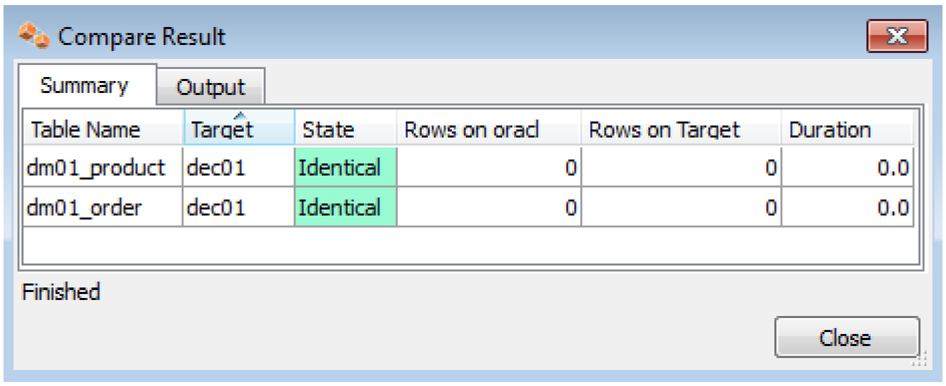
Table Name	Base Table Name
✓ All Tables	

Options / Contexts

- ● Bulk Granularity
- ○ Row by Row Granularity
- ☐ Verbose
- ☐ Apply: All
- ☐ Compare Db Sequences
- Parallelism for Locations: None
- Parallelism for Tables: None
- ☐ Schedule Compare Jobs
- Taskname: cmp

```
hvrcompare -gb -r db1 -l db2 -h oracle hvrhub1/!{QYnKvMoC}!@oracle hvr_demo01
```

The outcome of the comparison is displayed below;



Compare Result

Table Name	Target	State	Rows on orad	Rows on Target	Duration
dm01_product	dec01	Identical	0	0	0.0
dm01_order	dec01	Identical	0	0	0.0

Finished