Managing Databases and Database Servers

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This chapter describes how to set up and use databases in greater detail, giving you more control over how projects are saved and organized.

Using Databases

Even though DaVinci Resolve works with disk databases by default, which save user-accessible project files to a disk location of your choosing, many users prefer to use postgres database project management. Fortunately, this can be easily enabled. Resolve works from an internal database server, so it's possible to create multiple databases for maximum flexibility in organizing your projects. For example, you might create a database for each year, for each month, for each multi-episode series you work on, or any other organizational criteria that makes sense for the kinds of projects on which you work. Furthermore, facilities with multiple Resolve systems can implement a shared Remote Database Server.

> **TIP:** However you elect to organize your databases, keep in mind that smaller databases with less project data load and save faster.

If you're upgrading from an older version of DaVinci Resolve, you'll already be using a PostgreSQL database since that was the only method of working previously. As usual, you'll be prompted to upgrade your previous database when you open Resolve.

In either case, this section covers how to go back and forth between database management, and independent project management.

Switching to a PostgreSQL Database

To switch to PostgreSQL database project management, you need to open the Database Manager and create a new database for Resolve to use.

To switch to database management:

1   If necessary, click the Back to Log In button to return to the Login screen, and click the Database button at the bottom right-hand corner.
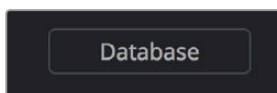
Database Manager button

The Database Manager appears.

Database Manager window

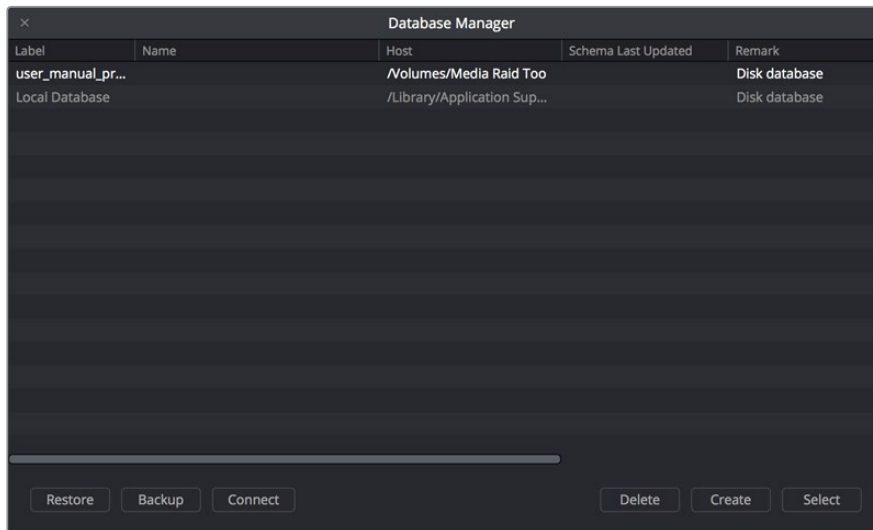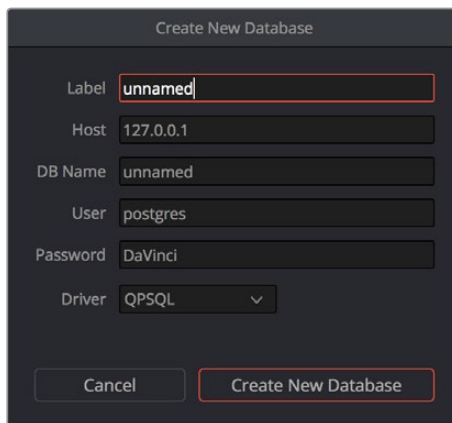**2**   Click Create.

3   In the "Create New Database" dialog that appears, make the following changes:

Creating a new database

Type a name for the database into the Label field. This is the name you'll see whenever you access the list of databases in the Database Manager, so choose something readable and clear, but don't use special characters, as these are prohibited.

For ease of remembrance, type a lower caps version of this name into the DB Name field (you don't have to use the same name, but it's easier this way). This name must be unique to any other databases currently in the list, but you cannot use spaces or special characters in this field.

Make sure the Driver pop-up menu is set to QPSQL. This guarantees that you're creating a database, and not a directory reference for project-based management.

4   Click Create New Database to create the database, and click OK when you're prompted that the database has been created successfully.

5   To begin using that database, select it in the list, and click Select.

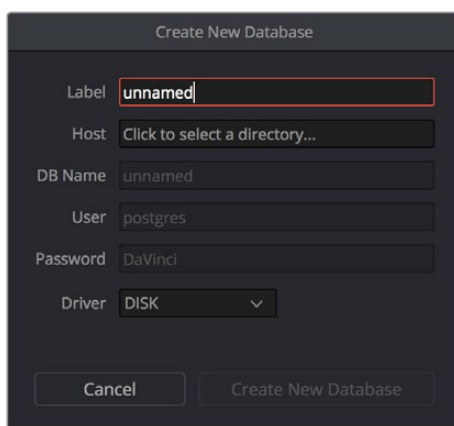DaVinci Resolve will now save projects into that database.

Switching to a Disk Database

If you're already using databases, and you'd like to switch to the simpler Disk Database approach, this is also easy to do using the Database Manager, but you'll be creating a different kind of item in the list. This is also the way you choose which directory Resolve uses to save the projects created by a particular User.

> **NOTE:** Linux systems can only use a PostgreSQL database, while Mac OS X and Windows systems can use either a PostgreSQL database or disk database management.

To switch to project-based management:

1   If necessary, click the Back to Log In button to return to the Login screen.

2   Click the Database button at the bottom right of the Login screen to open the Database Manager window.

3   Click the Create button.

4   In the "Create a New Database" dialog that appears, make the following changes:

Dialog for creating a new database

- Choose DISK from the Driver pop-up menu. This disables most of the fields that are available.
- Click the Host field, then choose a location and create a directory using the File Browser dialog that appears. When you're ready, select the directory you want to use, and then click Choose.
- Type a name into the Label field so you can identify this disk location.

5   Click Create New Database.

6   To begin using that Disk database, select it in the list, and click Select.

DaVinci Resolve will now save projects directly to that disk directory.

Working With the Database Manager

The Database Manager is where all databases are managed, whether they're traditional PostgreSQL-based databases, or Disk databases that allow direct project-based management.

While there's a lot of project management you can do from the Project Manager, if you're using databases, the Database Manager is critical for providing the interface to upgrade, create, backup, restore, and select databases on your system.

What's in a Database?

To provide a better understanding of why databases are useful, it helps to know how data is managed within each database. The following is the hierarchy of information that's stored within each database:

> Database > Users > Projects > Timelines > Clips > Timecode > Versions > PTZR/Grade

In plain English, each database is organized into a number of users. Each user is a container that holds one or more projects that are unique to that user. Each project contains one or more timelines, and each timeline contains one or more clips. Each clip contains a range of timecode and a reel, each of which points to three independent sets of adjustment data: Source settings (such as R3D or ALEXA metadata), and versions that contain pan/tilt/zoom/rotate/3D (PTZR) settings, and grades, which are applied to each clip in that order.

Where Are My Disk Databases, Anyway?

In the exceptionally rare instance that your system administrator needs to know where your DaVinci Resolve database is located, due to some catastrophic occurrence, every database that Resolve creates is located within a file hidden deep within your system with a location determined by the operating system you're using:

On OS X:

Library/Application Support/Blackmagic Design/DaVinci Resolve/ Resolve Disk Database

On Windows:

C:\ProgramData\Blackmagic Design\DaVinci Resolve\Support\Resolve Disk Database

This is primarily useful to know if only to demonstrate the importance of backing up your entire system to make sure this critical file is preserved. Do not, under any circumstances, remove, rename, or attempt to edit this file. The consequence of failure is the loss of all your database-managed project information.

NOTE: Linux cannot use disk databases, and only uses PostgreSQL databases.

Database Management

Here's a breakdown of all the commands that are available for managing the databases used by Resolve. The Create Database (+) and Disconnect Database (–) buttons are located at the bottom left of the Database Manager; all other commands are available from the Options pop-up menu at the upper right corner.

Methods of database management:

- New Database: Click Create New to add a new database to the Database list. See the previous section for more information on how to do this.

- Delete Database: Select a database and click this button to delete it, along with all users and projects inside of it. It's highly recommended to back up databases you're about to delete in case you later decide you need to retrieve their contents.

- Select: To choose a new active working database, click on a database from the list and click Select. This database will now be used for saving all new projects. Other Internal, Remote, and Disk databases will continue to appear in this list, and you can import projects from those databases using the Group Projects browser in the Project Manager. However, whenever you save a project, regardless of its origin, it will be written to the active working database selected here.

- Restore: If you have previously backed up a database, or have one from another system you can restore this database over the original or create a new empty database to restore to. Select the destination database and then click "Restore." Navigate using the open Finder to the database you wish to restore and select "Open." You then need to confirm to overwrite the database you selected as the destination and the database will be restored.

- Backup: You back up databases like any other file. This provides added protection should your system drive fail, or a backup can be used to move multiple projects between systems. Selecting 'Backup' will open the Finder window and you can define the file name and location to back up. Be sure not to change the .backup extension.

- Optimize: If the database in Resolve becomes so large that it affects performance, you may need to optimize it to improve access speed. Click "Optimize" and the database will be vacuumed of unnecessary spaces and reindexed.

- Upgrade: If you have databases that were created using previous versions of DaVinci Resolve, they probably need to be upgraded to be accessible. It's generally a good idea to back up any database you're planning to upgrade, in case something goes wrong.

- Connect: If you are connecting to a Remote Database Server, click Connect, change the IP address in the Host field to the IP address of the computer you've set up as the Remote Database Server, then type the remote database's name into the DB Name field. Accept the default "postgres" entry in the User field for all new databases with full read/write access, or change this to "MySQL" for read-only access to legacy DaVinci databases. For more information on Remote Database Servers, see the next section of this chapter.

- Disconnect: Disconnects databases to which you've previously connected, whether they're local on your machine or connected to via a Remote Database Server.

> **NOTE:** You cannot actually delete databases in DaVinci Resolve, you can only disconnect them so they don't appear in the Database list. However, disconnected databases can still be reconnected if you remember their name. The only way to completely delete a database entry in PostgreSQL is to do so from the command line, or to use the PGAdmin III application that accompanies the PostgreSQL installation that's part of the Resolve installation process.

Configuring and Using a Remote Database Server

Multiple DaVinci Resolve systems can also work on the same project at the same time using a shared database, which is enabled by setting up a Remote Database Server. Once you've set one up, there are two ways of using a shared database.

- The simplest case is for one user to open up a project, with subsequent users opening the same project in Read Only mode. For example, an assistant could be working with the colorist to prepare files for the next reel by conforming shots, managing VFX replacements, doing dust busting repairs, and so on. Using a Remote Database Server in this way, Resolve automatically prevents two users from working on the same project by creating a copy of a project that's already in use, and any changes made will have to be in this duplicate project.

- Alternately, you can use the Collaborative Workflow features introduced in Resolve 11 to enable an owner to open up a project on a Shared Database, and multiple collaborators to open the same project, with all participants actually writing data to the same project file. The rule with collaborative workflow is that the first person to open a project, the owner, is the only one who can make editorial changes to the Timeline. Collaborators can grade and edit Media Pool metadata, but they cannot alter edits in the Timeline.

However you decide to work, the Database Server can be one of the actively used Resolve workstations, or it can be another computer on your network with DaVinci Resolve installed that simply hosts your projects (a dongle or video card is not required). All machines participating in a collaborative workflow must be on the same network.

Use of a separate workstation to operate as the Remote Database Server is recommended for facilities with more than two DaVinci Resolve systems, to ensure that something as simple as a user shutting down their system doesn't make all projects suddenly unavailable. By clicking the Connect button in the Database Manager, you can enter the information that enables a connection to the remote database.

For more information on setting up and using a Remote Database Server, see Chapter 42, "Collaborative Workflow."

About Locked Projects

Large projects being worked on in parallel can be split into sections, so multiple colorists can work simultaneously in different suites. For example, a feature film may be split into reels, or the film separated from the trailer and video press kit. Each section can use grades from the other segments as required to keep the shots balanced.

If you are sharing a database with other DaVinci Resolve systems, but you're not using Collaborative Workflow, then some of the projects will appear with a Lock icon to the left of the project name. When a shared project is loaded, it is automatically locked in Read-only mode to prevent multiple users from accessing the project at the same time. If you load a locked project and make changes anyway, you'll need to save a new project file using a new name to preserve your work.

To unlock a project:
- Log in as Admin, and then click the Unlock button.

Setting Up a DaVinci Resolve Project Server

All participants in a Collaborative Workflow must have the Full Version of DaVinci Resolve, and a Database Server must be be set up. The Database Server can be one of the actively used Resolve workstations, or it can be another computer on your network with DaVinci Resolve installed that simply hosts your projects. A dongle or video card is not required to use the database, although it's easier if you have a dongle on hand to set it up initially. Most importantly, all machines participating in a collaborative workflow must be on the same network.

Set up of a Database Server requires an at least cursory knowledge of command line text editing. If you don't understand the following instructions, it's best to have an IT professional do this for you.

To set up a Mac as a DaVinci Resolve database server:
1 If you haven't already, install the full version of DaVinci Resolve on the Mac that you plan to use as the remote Database Server. This machine doesn't need video cards or a dongle connected (although it's good to have a dongle available for the last step), but the Resolve application installer sets up PostgreSQL as well as the database structure which is configured for Resolve.

  Once you have installed the software and restarted the system, you need to set up the permissions and access to the PostgreSQL server application running on this machine. Be sure to follow the instructions carefully.

2 Make sure you log in as a user with Admin privileges, then open the Terminal application, located in the /Applications/Utilities folder, and open up the postgres environment for editing by typing:

```
sudo su – postgres
```

3 At the prompt, type that computer's administrator password and press return.

4 When the "postgres$" prompt appears, you'll create a backup of the "pg_hba.conf" setup file for safety by typing:

```
cp /Library/PostgreSQL/8.4/data/pg_hba.conf /Library/PostgreSQL/8.4/data/
pg_hba.conf.backup
```

> **NOTE:** the entered text above should be one line with no space between the / and PostgreSQL

5   In the next step, you'll add your particular local IP network range (the example given in these instructions is 192.168.1.88, though this value may well be different on your network). Open the System Preferences, then open the Network panel, and write down the IP address you see there. The computer being used as the Network Server should not use DHCP, instead it should have a manually entered, stable IP address so that other computers can reliably connect to it.

6   In the following instruction, change the four values of the IP address below to match the one you wrote down, and then keep the number that follows after the forward slash (/) as 24, which specifies that the fourth number of the IP address can be any number.

```
echo "host all all 192.168.1.88/24 md5" >> /Library/PostgreSQL/8.4/data/
pg_hba.conf
```

7   With this accomplished, open a Finder window, open /Applications/PostgreSQl 8.4/, and double-click the Stop Server application to run it and stop PostgreSQL.

8   After you get a message stating the server has stopped, double-click the Start Server application to start it up again. You should get a message that the server has started, and this lets you know that you've successfully restarted the Database Server with the new settings you've entered.

9   With this accomplished, plug in a Resolve Dongle, if necessary, in order to run Resolve. At the Resolve login screen, click the Database button in the lower right-hand corner, then click the Plus (+) button in the lower left-hand corner to create a new database that you'll be using as the shared database on that computer.

10 In the Create New Database dialog, enter a name into the Label and DB Name fields. This name doesn't have to be anything special, although the DB Name field doesn't allow caps or special characters other than underscores. Make sure that the Driver pop-up is set to QPSQL, then click Create New Database.

11 To use that database on this computer, select it in the list, then click the Option menu at the upper right-hand corner, and choose Select to open that database and return to the DaVinci Resolve login screen.

12 At this point, you can either continue using DaVinci Resolve, or you can quit.

Connecting to Projects on a Server

You now have a remote Database Server that you can connect to from each of the Resolve systems on that network. PostgreSQL runs automatically, so you must have this computer turned on whenever you wish to open a project it's serving in Resolve on another computer. However, DaVinci Resolve does not have to be actively running on the Database Server for this to work.

To connect DaVinci Resolve on one computer to the Database Server on another:

1   Open DaVinci Resolve on a computer that's on the same network as the Database Server. At the Resolve login screen, click the Database button in the lower right-hand corner, then click the Option pop-up menu at the upper right-hand corner of the Database Manager (it looks like three vertical dots), and choose Connect.

2   In the Connect dialog, type the label and name of the database on the Database Server that you want to connect to in the Label and DB Name fields. Next, type the IP address of the Database Server into the Host field, and make sure that the Driver pop-up is set to QPSQL. When you're done, click Connect Database.

3 If all the information you entered was correct, then that database should appear in the Database Manager list. With it selected in the list, click the Option menu at the upper right-hand corner, and choose Select to open that database and return to the DaVinci Resolve login screen.

This computer should now have access to the same users and the same projects that are hosted on the Project Server, and you can work as you normally would.

To create a new project to be used in a collaborative workflow:

1 Open DaVinci Resolve on a computer with a database that's connected to a Database Server, log in as a user, and click the plus (+) button to create a new project.

2 Enter a name for the new project, and click Create. If you've just now opened Resolve, the default new project thumbnail at the upper left-hand corner appears with this new name, otherwise a new project with a blank thumbnail appears in the Project Manager.

3 Right-click the new project you created, and choose Collaboration from the shortcut menu.

4 The owner can now import whatever media is necessary for that project, editing a new timeline, or importing a timeline from another application. Projects in collaborative workflows can use media on a storage area network (SAN) so that each owner and collaborator can be properly linked to the same media. Alternately, each participant in a collaborative workflow can work with an exact duplicate of the media copied to a local volume. Each participant's media volume must be identically named, so that each participant can be properly linked to the same media with the same file path.

At this point, each new timeline you create will use Remote versions, which is important for collaborative workflow to function properly. You can now add media and create new timelines as necessary to start working.

Troubleshooting Tips When Setting up a Project Server

DaVinci Resolve manages all projects using PostGreSQL, which is an open-source database management system. If you have difficulty connecting to a shared database, or difficulty opening databases in general, it's probably because the Database Server you set up has been inadvertently misconfigured. Here are some ways you can check to see what the problem might be.

Checking to See If PostgreSQL Is Running Properly

To double-check whether PostgreSQL is running as it should, you can open Terminal and enter the following command, followed by Return:

```
ps -ef | grep PostgreSQL
```

If all is well, the text output by this command should resemble the following:

```
502  118  1  0  12May14 ??  0:12.77 /Library/PostgreSQL/8.4/bin/postmaster
-D/Library/PostgreSQL/8.4/data

501 88287 88143  0  11:34AM ttys000  0:00.00 grep PostgreSQL
```

The first line indicates the server is running.

Checking the PostgreSQL Setup File

Many problems can be chalked up to the "pg_hba.conf" file being misconfigured. To read the content of this file, open Terminal and enter each of the following commands, followed by Return:

```
sudo su - postgres
```

At the prompt, type your password and press return.

```
cd /Library/PostgreSQL/8.4/data/

cat pg_hba.conf
```

The contents of the "pg_hba.conf" file should appear. Properly configured, it should resemble the following sequence of text, but with your IP address:

```
# TYPE          DATABASE      USER    CIDR-ADDRESS          METHOD

# "local" is for Unix domain socket connections only

local         all           all                           md5

# IPv4 local connections:

host          all           all     127.0.0.1/32          md5

# IPv6 local connections:

host          all           all     ::1/128               md5

host          all           all     192.168.1.88/24       md5
```

Deleting and Restoring the Original "pg_hba.conf" File

If the "pg_hba.conf" file is misconfigured, you can restore the backed up "pg_hba.conf.backup" file in order to restore PostgreSQL to its previous configuration by entering the following commands.

```
rm pg_hba.conf

cp pg_hba.conf.backup pg_hba.conf
```

With this accomplished, open a Finder window, open /Applications/PostgreSQl 8.4/, and double-click the Stop Server application to run it and stop PostgreSQL. After you get a message stating the server has stopped, double-click the Start Server application to start it up again. You should get a message that the server has started, and this lets you know that you've successfully restarted the Database Server with the original working settings.

At this point, you can try the procedure described above in "Setting Up a DaVinci Resolve Project Server."

Manually Disabling Sharing of a Database Server

If you've lost your backup of the "pg_hba.conf" file (or you never made a backup to begin with), then you can disable sharing by editing the following file:

```
/Library/PostgreSQL/8.4/data/pg_hba.conf
```

Open the "pg_hba.conf" file in a text editor capable of editing and saving plain text documents, and remove the last line of the file:

```
host all all 192.168.1.88/24 md5
```

This is the line you added in the procedure to set up a DaVinci Resolve project server previously. The best way of editing the "pg_hba.conf" file is using a command line text editor in the Terminal. If you're not familiar with how to do this, use the following instructions.

To disable database server sharing:

1   Make sure you log in as a user with Admin privileges, then open the Terminal application, located in the /Applications/Utilities folder, and open up the postgres environment for editing by typing:

    `sudo su – postgres`

2   At the prompt, type that computer's administrator password and press Return.

3   When the "postgres$" prompt appears, type the following to use the "Pico" text editor to edit the "pg_hba.conf" file:

    `pico /Library/PostgreSQL/8.4/data/pg_hba.conf`

4   The "pg_hba.conf" file opens in Pico, ready for editing. Pico exposes all necessary commands along the bottom of the terminal view. Note, even on Mac OS X, all Pico keyboard commands use the Control key, not the Command key. To start, all you need to do is use the arrow keys to move the cursor down to the following line of text, at the very end of the file:

    `host all all 192.168.1.88/24 md5`

5   Then, use the Forward Delete key to delete this entire line of text.

6   When you're finished, press Control-X to exit Pico. You'll be prompted about whether or not you want to save your changes ("Save modified buffer") so press Y to save and exit.

Reconnecting Database Entries That Have Disappeared

In some cases, misconfigured databases that have been stopped while Resolve has been launched can result in the list of databases in the Resolve database manager being cleared out. If this happens, it's simple to reconnect to these databases using the PGAdmin Setup application.

To find lost database entries:

1   Open /Applications/PostgreSQl 8.4/, and double-click pgAdmin III.

2   Click the "Add a connection to a server" button.

3   Enter the following into the New Server Registration window:
    - Type "localhost" into the Name field.
    - Type "DaVinci" into the Password field.

4   Click "OK."

5   When prompted about saving passwords, click "OK."

6   In the Object Browser, you should be able to see localhost as an entry in the Object browser list. Click the disclosure triangle to the left of localhost, and then click the disclosure triangle to the left of Databases.

You should now be able to see all of your Resolve database entries in a list, and you can use these database names to reconnect to these databases from within the DaVinci Resolve database manager.