

Kentico provides a way to store virtual objects in the file system in addition to the database. This can be useful if you need to prepare your site for [deployment](#), or if you want to manage the code of objects [using a source control system](#).

Virtual objects that require compilation include the following:

- [Form layouts](#) (ASCX type)
- [Page layouts](#) (ASCX type)
- [Transformations](#) (ASCX type)
- [Web part layouts](#)

To deploy a website to another system:

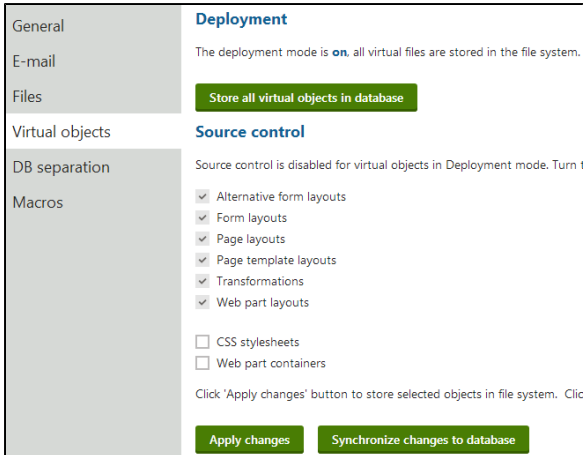
1. Open the **System** application.
2. Select the **Virtual objects** tab.
3. Click **Store all virtual objects in file system**.
 - The system saves all virtual objects (alternative form layouts, form layouts, page layouts, page templates, transformations and web part layouts) on your disk.
 - The target folder is `~/CMSVirtualFiles`.
4. Publish (and compile) the files in Visual Studio. See [Publishing projects from Visual Studio](#) for more information.
 - At this time, you can still edit the code of objects in the Kentico user interface, but any changes will require you to compile the files again.

When deployment mode is **OFF**:

- The storage location of the virtual objects depends on the settings of the **Source control** options.

When deployment mode is **ON**:

- All objects that require compilation are moved into the file system on the local disk. The target folder is `~/CMSVirtualFiles`.
- You can edit the code of objects in the user interface. Changes are saved into the files immediately.
- You can edit the object files in Visual Studio or another external editor.
- To move objects back into the database, click **Store all virtual objects in database** (deletes the files on the disk).
- You can configure the **Source control** options for objects that do not require compilation (Web part containers and CSS stylesheets).



General

E-mail

Files

Virtual objects

DB separation

Macros

Deployment

The deployment mode is **on**, all virtual files are stored in the file system.

Store all virtual objects in database

Source control

Source control is disabled for virtual objects in Deployment mode. Turn it on to enable source control for virtual objects.

- ☒ Alternative form layouts
- ☒ Form layouts
- ☒ Page layouts
- ☒ Page template layouts
- ☒ Transformations
- ☒ Web part layouts
- ☐ CSS stylesheets
- ☐ Web part containers

Click 'Apply changes' button to store selected objects in file system. Click 'Synchronize changes to database' button to move selected objects back to the database.

Apply changes **Synchronize changes to database**



Limitations

- Do not [apply hotfixes](#) while deployment mode is on. Disable deployment mode before you start the hotfix procedure, and re-enable it once the hotfix is applied.
- The [Staging](#) feature has limited support for synchronizing object code when using deployment mode:
 - On *source* servers, staging tasks are generated only if you edit code in the Kentico UI or after you synchronize changes from files into the database.
 - On *target* servers, deployment mode must be **off** if you wish to use incoming staging tasks to update object code.



Error when disabling deployment mode

When disabling deployment mode (returning virtual files to the database), you may encounter the **"The directory is not empty."** error. This occurs if the web application is currently using some of the virtual files, and cannot delete the content of the *CMSVirtualFiles* folder as a result.

The error does not affect the functionality of virtual files – the system correctly disables deployment mode and all virtual file data is returned to the database. The only consequence is that the *CMSVirtualFiles* folder and some of its content remain on your file system. You can try deleting the folder manually at a later point.

Deployment mode on web application projects

If your project was installed as a web application, you need to perform additional steps after enabling deployment mode:

1. Edit your project in Visual Studio.
2. Click **Show all files** at the top of the Solution Explorer.
3. Right-click the **CMSVirtualFiles** folder and select **Include in Project**.
4. Select the **CMSVirtualFiles\WebPartLayouts** folder and convert it to the web application format:
 - Open the *Project* menu on the main toolbar, select **Convert To Web Application** and click **Yes** in the confirmation dialog.
5. Build the **CMSApp** project.

The deployed files are now integrated in your web application project. Objects that have code behind files ([Web part layouts](#)) are converted to the web application format with designer files.