

CLIENT APPLICATION

Most of the SyncCloud functionality is, well, in the cloud. Most of the user interaction with the system is done through Web applications running in a Web browser. Therefore SyncCloud is largely platform independent. However Web browsers by design do not have access to many underlying device resources such as file systems and many of the OS functions. To facilitate automated data delivery and synchronization SyncCloud system needs access to these resources. That is accomplished with the specially designed automated client application.

SyncCloud automated client application is a platform specific software program designed to provide user devices with a “gateway” to sending and receiving data within the SyncCloud virtual project. The application is available for Windows and Android operating systems and can be downloaded from the main SyncCloud Web site.

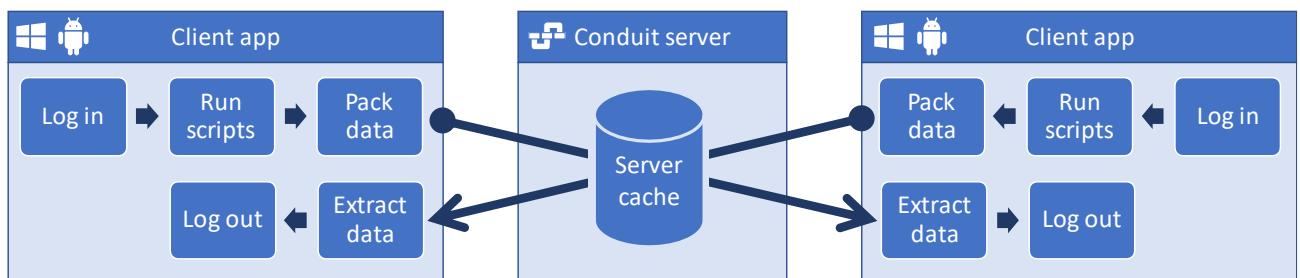
Client application requires access to native OS environment and resources:

- OS thread pool - client application is a native process that is directly executed on the device within the operating system thread pool.
- File system – client application directly interacts with the OS file system to read/write files with data synchronized within the virtual project
- Internet connection – client application uses devices Internet connection to communicate with the SyncCloud global resources as well as conduit servers

DATA TRANSFER PIPELINE

The main purpose of the SyncCloud system is to transfer data, such as files or serialized objects between two Windows or Android devices. The data is transferred between project users using specialized client applications installed on their end devices via Conduit server endpoint linked to the virtual project. Figure 1 describes the data transfer pipeline.

FIGURE 1. SYNCCLLOUD DATA TRANSFER PIPELINE



Client application initializes synchronization with the Conduit server by logging into the SyncCloud system. At this stage, the user provides their credentials in the form of username and password. Additionally the client application also needs to supply the globally unique project identifier.

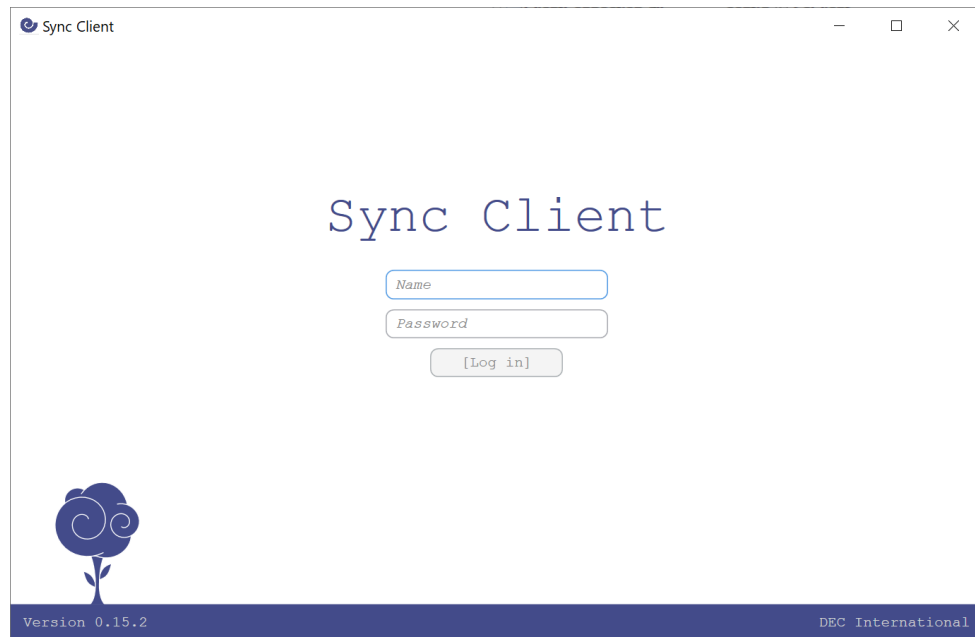
Upon successful login the SyncCloud global service provides the client address of the Conduit server which is used in the requested project, as well as automated script data to be executed by the client. The client application then proceeds to execute the received scripts. If no scripts are assigned to the user, this step is skipped.

During script execution the client application may create data packages to be delivered to another user in the project. The next stage in the pipeline is synchronization with the Conduit server. If any data packages are scheduled to be delivered, they are at this time uploaded to the Conduit server. Similarly, if there are any incoming packages sent by

another user in the project are to be received from the Conduit server, they are downloaded from the conduit server and extracted. All of the data transferred between client applications and conduit server is encrypted.

WINDOWS CLIENT APPLICATION

Client application is available as a Windows desktop application. It can be downloaded from the SyncCloud web site. The name of the executable file is "ScClient.exe". When run the application expects project global identifier to be passed as command line parameter.



Users need to fill in their project username and password provided to them by the project administrator. After clicking the **[Log in]** button the client application will request user authentication by the global service and if successful will automatically execute the client pipeline described in figure 1.

Command line parameters are represented by a key/value pairs delimited by the "=" sign. For example to start the client application for the project with global ID "xxx" the following command line may be used:

```
"ScClient.exe projectid=xxx"
```

To further automate the client application execution the following command line parameters may be passed when running the client:

- **Username** – client automatically fills in username text box with the given value
- **Password** – client automatically fills in password text box with the given value. If username is also present in the parameters, the client will automatically initiate the login protocol
- **Log** – path to the optional text log file.

Note: Order of parameters in the command line is unimportant

After the successful execution the client application automatically terminates its process. The log file may then be evaluated by other external applications.

ANDROID CLIENT APPLICATION

Functionally SyncCloud client application for Android is very similar to Windows client. It follows the same execution pipeline and requires the same input parameters. Unlike Windows application, however, it requires installation on the Android system. The installation can be preformed by executing the package file “**com.dec.syncclient.apk**” on the target device. After installation completes, the app will be added to the app drawer of the device.

Note: *Minimum Android version required to run the app is **Android 5.0 (API level 21 – Lollipop)***

If the app is started without any parameters by touching the icon in the app drawer, the first page will request to input the project ID provided by project administrator. In case the project ID is valid, the project will be added to the list of cached projects and will be retained while the app is installed on the device. The following pages will request project username and password. Once those are provided and the user is successfully authenticated with the global service, the client application executes the client pipeline in the same manner as the Windows client app.

Just like Windows application, execution of the Android app may be automated with input parameters. Input parameters include:

- **ProjectId** – client automatically assigns the project id for the session, even if that ID was not previously cached.
- **Username** – client automatically fills in username text box with the given value
- **Password** – client automatically fills in password text box with the given value. If username is also present in the parameters, the client will automatically initiate the login protocol

Unlike Windows, parameters may not be passed in a command line. Instead these parameters need to be passed by another Android activity, such as CsEntry, as part of the app starting intent.