What is Plugin

In this lesson we will explain what are Plugins and how they work.

C4 System is an open platform allowing extension and customization of functionalities according to the customer's needs. These extensions are called Plugins. In addition to Driver and IS Connector, the C4 Transformers generation brings further additions in other areas.

Plugin is a DLL file located in environment of a particular application within the C4 System, according to its scope of work. Client Panels are placed in the C4 Client application, Smart Routine automatizations are in the Workflow Management module, and Reports can be found in the C4 application server. Drivers and IS Connectors which are used for integration of external systems are placed in Plugin Manager.

How do Plugins work?

The application where the Plugin is running is a host for this Plugin. It creates environment in which the Plugin works and provides all support services.
Let's have a look at the way how it's done.
A host initializes Simple Client, which enables communication with the C4 Server. Then it also initializes the particular Plugin, and shares reference to the already initialized Simple Client. In a result, Plugin can directly communicate with the C4 Server.
For each type of Plugin Gamanet developed and constantly improves a Plugin SDK. It is a package of tools which can be used by developers to improve the process of development.

Simple Client is an essential part of the whole C4 System. Let's have a closer look at it now.
Simple Client is a module that provides access to the central database in the application server. It is used by all client applications of the C4 System and also by Plugins.

How does the Simple Client work?
Simple Client consists of connectors in the form of DLL files. They are arranged in a chain according to their scope of work. This chain takes care of communication

between the client application - consumer and the central application server. Simple Client offers developers a set of functions (API), which are internally implemented in each connector and mapped from one connector to another. Each connector performs specific operations within its scope.

The chain always contains a pair of connectors which provide connection between the client and server part of the Simple Client module. This pair can have different forms. The right one is established automatically during the module initialization, based on the predefined name of the setting.

In case of a standard client application, the application server is accessed through HTTPS client and REST API calls. C4 Servers communicate through encrypted TCP connection. Various applications within one computer usually communicate through so called named pipes.

Simple Client uses two kinds of communication within the C4 System topology. The first one is Client-Server communication, when the client application approaches the central database in the form of transaction calls. Let's take an example of calling a list of all persons registered in the C4 System. This call is processed by the connectors one by one, each of them performing their own tasks. For example, the Permissions connector evaluates whether the logged-in user is allowed to make this call and if so, then it goes through the connectors up to the central database. The database returns the list of persons back in the same way. In the Permissions connector, the list is filtered only to the persons that the logged-in user can see. In the last step, the final list is delivered to the Client.

The second form of communication is Client-Client communication. It's when two consumers of Simple Client communicate with each other in the form of messages using technology of a Message Pump. The message is processed by individual connectors, including evaluation of access rights for sending the message. On the server side, router redirects and delivers the message to the particular Simple Client consumer as a recipient of the message. For example, an Open Door command is a message delivered to the Driver and the Driver sends it to the particular device.

Simple Client, as a basis of the whole C4 System, is used in all its parts. Our internal development is based on the Simple Client too. It is a guarantee that it will be further improved and potential issues will be fixed quickly.

The way how Plugins are developed will be described in the next lesson.