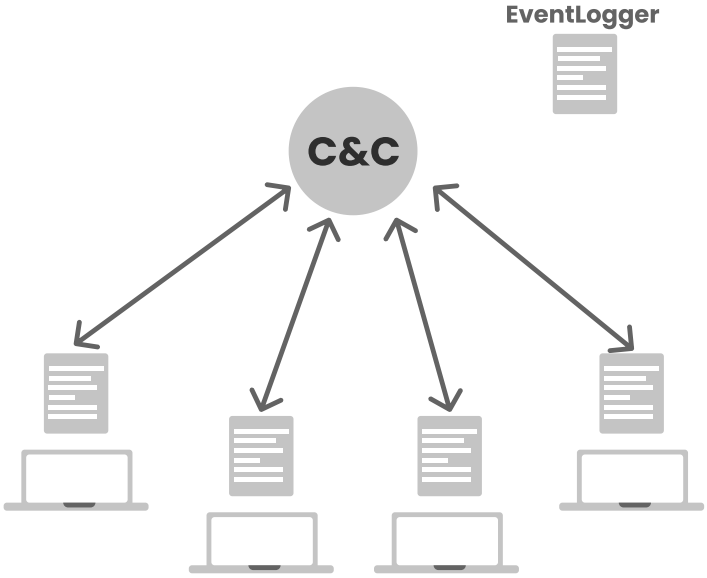
EventLogger for Windows

The project is composed of two parts:

- `EventLogger`: a C# script that logs mouse, keyboard and process events and sends them to the command and control server.
- `C&C Server`: the command and control web-server written Python 3.



EventLogger

The **EventLogger** use the Windows API to log events. It logs the following events:

- *Mouse events*: MouseClick and MouseDoubleClick only
- *Keyboard events*: using the Windows key enumeration format (see here)
- *Process events*: using the process name and the timestamp.

The logger has three main components:

- `Constants`: a class with the constants used by the logger.
- `Logger`: a class that implements the logging functionality.
- `EventLogger`: a class that implements the main functionality of the logger.

The `Constants` class isn't very interesting, it contains just the constants used by the logger including the dynamic settings that can be changed in the `C&C Server`.

The `Logger` implements the logging functionality, including the creation of the log file. The logger stores all the events in a string variable called `_line` and periodically clears it to avoid memory overflow. There are two conditions to clear the `_line` variable:

- reaching the maximum size of events: in this case the `Logger` class saves the events in a file.
- use the `Server` api to send the events to the server.

The `EventLogger` class that is the main class. After setting up the methods that catch the events, it starts a thread that every `SECONDS_API_INVOKE` (a dynamic setting) calls the `Server` api to send the events. There are four dynamic settings:

```
public int SECONDS_API_INVOKE = 10;
public bool LOG_PROCESS_ON_DOUBLE_CLICK = true;
public bool LOG_MOUSE_EVENTS = true;
public bool LOG_KEYBOARD_EVENTS = true;
```

Thread that periodically calls the C&C server api

```
try{
    while (true){
        Thread.Sleep(config.SECONDS_API_INVOKE * 1000);
        logger.SendLog();
    }
}
catch (Exception ex){
    Console.WriteLine(ex);
}
```

- `LOG_PROCESS_ON_DOUBLE_CLICK`: if true, the `EventLogger` logs the process name and the timestamp after a double click event.
- `LOG_MOUSE_EVENTS`: if true, the `EventLogger` logs the mouse events.
- `LOG_KEYBOARD_EVENTS`: if true, the `EventLogger` logs the keyboard events.
- `SECONDS_API_INVOKE`: the time in seconds between two invocations of the api.

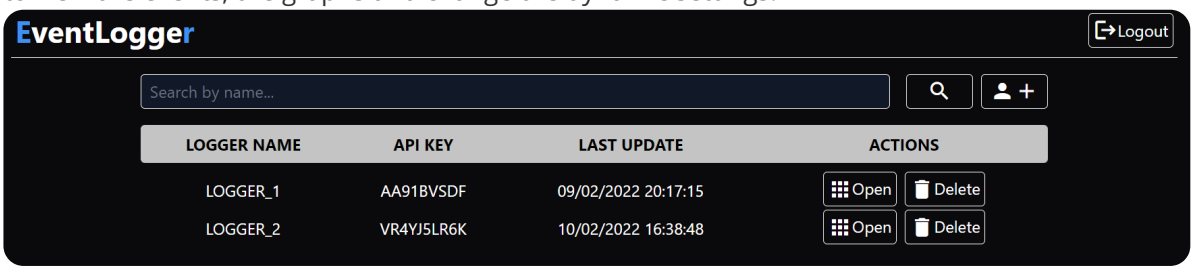
C&C Server

The `C&C Server` is a web-server written in Python 3 using the Django framework, using SQLite as the database. There are two apps, one for the `UI interface` and the other for the `EventLogger` api. In the `EventLogger` section is the api used to get the events from the `EventLogger` and convert every single event to a format compatible for the UI interface.
The `UI interface` helps to manage many different `EventLogger` instances, each one with its own settings. The interface basically allow the attacker to:

- Create new `EventLogger` instances
- View the events captured by the instance
- View some graphs of the events
- Change the dynamic settings a specific `EventLogger` instance

Homepage

Here are all the `EventLogger` instances, for each one there is a link to the app where it is possible to view the events, the graphs and change the dynamic settings.



Events view

These are all the events of the `EventLogger`, the events are sorted by timestamp. It is also possible to see the processes captured in a record.

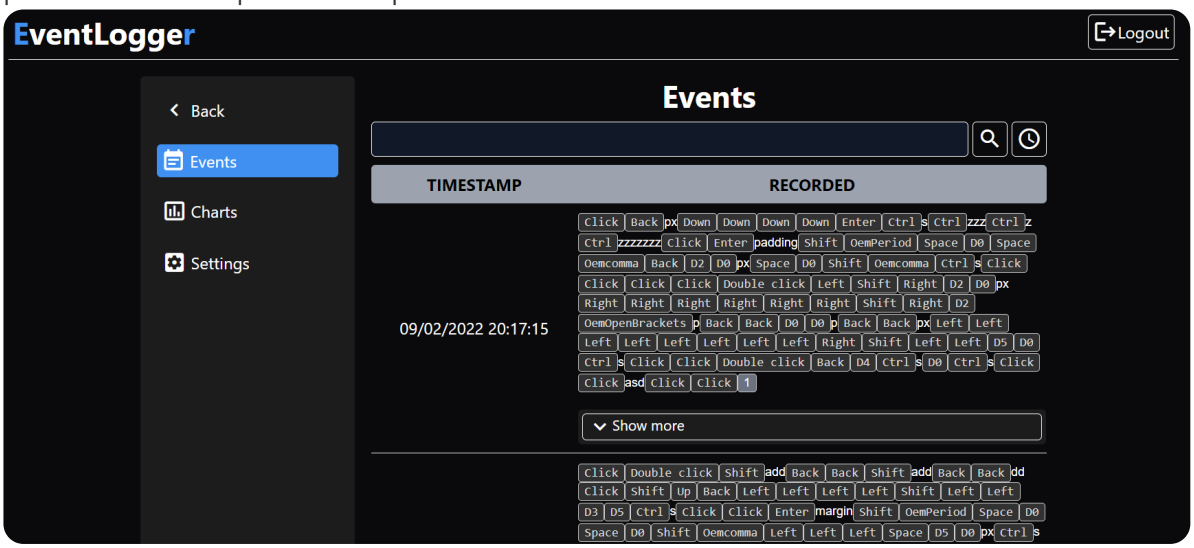


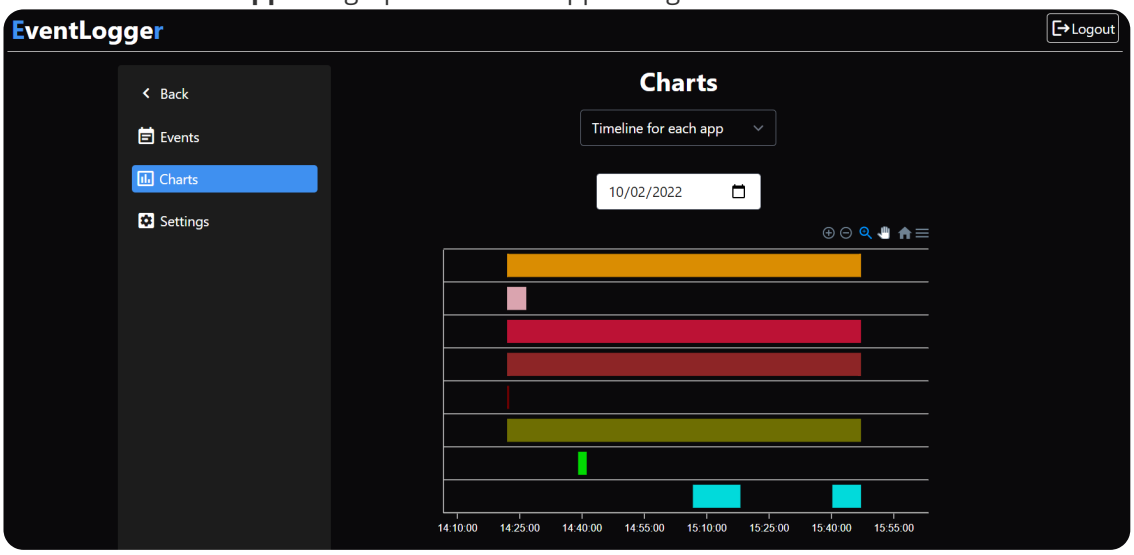
Chart view

All charts are useful to observe the victims behavior. The charts are:

- **Total usage for each app**: the total usage of each app.

- **Total events per day**: all captured events in a day, grouped by app and sorted by timestamp.

- **Timeline for each app**: the graph shows the apps' usage timeline.



Dynamic settings

Here there are all the dynamic settings of the **EventLogger**. Already described in the previous section.