

WifiControl

API Reference

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History

|  |  |  |  |
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| 0.2 | 28-11-2018 | C. Custers | Update API + config. |
|  |  |  |  |
|  |  |  |  |

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# Introduction

## Scope

This document describes the Plugin WPEFramwork API interface. This plugin can be configured to control the wireless network interface on the target device. The plugin is depending on the WPASupplicant application on the target device. This plugin is also depending on the NetworkControl plugin for IP configurations. NetworkControl and WifiControl are part of the WPEFramwork infrastructure, for details on the WPEFramwork API, refer to: [[WPEF]](https://github.com/WebPlatformForEmbedded/WPEFramework)

## Case sensitivity

All identifiers on the interface described here are case-sensitive. E.g. an id known in the plugin as 'C0FFEE' is not the same as 'c0ffee'.

All keywords, entities, properties, relations and actions should be treated as case-sensitive.

## Acronyms, Abbreviations and Terms

The next list provides an overview of acronyms and abbreviations used in this document and their definitions.

|  |  |
| --- | --- |
| **Acronym** | **Definitions** |
| API | Application Programming Interface |
| JSON | JavaScript Object Notation |
| UTC | Coordinated Universal Time |

Below terms are listed with their definitions, as used in this document.

|  |  |
| --- | --- |
| **Term** | **Definitions** |
| Callsign | The callsign is the name given to an instance of a plugin. One plugin can be instantiated multiple times, but each instance the instance name, callsign, must be unique. |
| Proxy | An object in one process space representing the “real” object in another process space. The Proxy takes care of marshalling the parameters. |
| Stub | An object in the process space that contains the actual object. The stub takes care of un-marshalling the request from the Proxy and executes the call, on behave of the Proxy object, on the real object |

## Standards

Date time formats between the systems shall be in UTC time and W3C (ISO 8601 profile) formatting [ISO 8601], e.g.: 2004-11-05T13:15:30Z. This way time discontinuities can be avoided due to daylight savings. Note that all interfacing systems must decode/encode the date time to the correct local time.

Languages used in the WPEFramwork will be conform [ISO 639-1] using two letter language codes. If WPEFramwork encounters a language code it does not recognize, it will use ‘xx’ instead. For a list of available two letter ISO language codes, please visit: [[ISO-639-2]](http://www.loc.gov/standards/iso639-2/php/code_list.php)

## References

This section lists the references made in this document:

|  |  |
| --- | --- |
| [[WPEF]](https://github.com/WebPlatformForEmbedded/WPEFramework) | WPEFramework API Reference |
| [[HTTP]](http://www.w3.org/Protocols) | Hypertext Transfer Protocol |
| [[ISO-8601]](http://www.iso.org/iso/date_and_time_format) | Date and time format |
| [[ISO-3166]](http://www.iso.org/iso/country_codes.htm) | Country code specification |
| [[ISO-639-2]](http://www.loc.gov/standards/iso639-2/php/code_list.php) | Language code specification (Alpha-2 code) |
| [[JSON]](http://www.json.org/) | JavaScript Object Notation |
| [[URLENC]](http://www.w3schools.com/tags/ref_urlencode.asp) | URL Encoding |

## Open Issues

This is a list of open issues that needs to be resolved:

* This document is still a work in progress.

## Limitations

The information described in this document is preliminary and subject to change in the future.

Legend:



**Be aware of:** implementation choice is needed or side-effect needs to be handled.



**Implementation advice:** Guide line for implementation mostly related to performance.

# Abstraction model

## Process/Component overview

WPEFramework

WPA Supplicant

Wifi

Control

HTML / JavaScript

[REST]

[Domain]

This document describes the RESTFull interface, indicated by [REST] in the picture above. The Wifi Control plugin described in the document, is the implementation that translates/converts the RESTFull calls towards the WPASupplicant.

The setup consists of 3 processes.

1. The WPASupplicant
2. WifiControl, together with the WPEFramework.
3. The HTML/Javascript running in a browser space.

Communication between WPASupplicant and WifiControl is realized by one domain socket connection. The communication from HTML /Javascript with the WifiControl can be multiple and is based on http restfull calls over TCP/IP.

## Model

**Network [BSSID]**

SSID

Signal

Frequency

Pairing

Key

Throughput

**Config [SSID]**

Open,WEP,WPA(2), Enterprise

Mode (AP/Link)

Depending on key/pair:

Username/Password/Hash

The plugin will scan for Network objects. Each network object represents a radio that was found during the scan. Networks are volatile and not cachec/stored on disk. A network is identified by the BSSID (Binairy SSID).

The user of the plugin can create Config objects. A config object is identified by the SSID. The config object contains all configuration information required to connect to a network or to setup a network. Config objects can be persisted on disk. These persisted config objects will be loaded during the startup of the plugin.

During startup the Network with the strongest Signal that has an associated Config [SSID] will be automatically connected.

It is also possible to start the Wifi as an AccessPoint. This way other devices can connect to this Wifi.

# WifiControl Plugin

## Configuration

|  |  |
| --- | --- |
| callsign | [string] the instance name for the plugin e.g. WLAN0. Default: WifiControl. |
| classname | [string] WifiControl. |
| locator | [string] libWifiControl.so |
| autostart | [bool] should the WifiControl plugin be instantiated at the moment the WPEFramework starts up. |
| configuration | [JSON] JSON object specifying the exact configuration for this plugin. See the next paragraph for details. |

Configuration of the WifiControl Plugin:

|  |  |
| --- | --- |
| connector | [string] the domain socket for WPASupplicant communication. Default: /var/run/wpa\_supplicant. |
| interface | [string] interface to control, using this plugin. Default: wlan0 |

## Application Programming Interface (API)

### General information

Using this method, actual trace status information can be retrieved from the WPEFramework.

|  |  |
| --- | --- |
| Request: | GET /Service/WifiControl |
| Success: | HTTP/1.1 200 OK “Current Status.”  { status\_info } |
| Failure: | HTTP/1.1 400 OK “Unsupported GET request.” |

Using this method to retrieve wifi-networks.

|  |  |
| --- | --- |
| Request: | GET /Service/WifiControl/Networks |
| Success: | HTTP/1.1 200 OK “Scanned networks”  { “networks”: [ network\_info ] } |
| Failure: | HTTP/1.1 400 OK “Unsupported GET request.” |

Using this method to retrieve the configs.

|  |  |
| --- | --- |
| Request: | GET /Service/WifiControl/Configs |
| Success: | HTTP/1.1 200 OK “Get configurations”  { “configs”: [ config\_info ] } |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Unsupported GET request.” |

Using this method to retieve config for a specific <ssid>.

|  |  |
| --- | --- |
| Request: | GET /Service/WifiControl/Config/<ssid> |
| Success: | HTTP/1.1 200 OK “Get configuration.”  { config\_info } |
| Failure: | HTTP/1.1 204 NO\_CONTENT “Empty config.” |

### Config operations

Using this method, a new config is created.

|  |  |
| --- | --- |
| Request: | PUT /Service/WifiControl/Config  { config\_info } |
| Success: | HTTP/1.1 200 OK “Config set.” |
| Failure: | HTTP/1.1 204 NO\_CONTENT “Nothing to set in the config.” |

Using this method, an existing config is updated.

|  |  |
| --- | --- |
| Request: | POST /Service/WifiControl/Config  { config\_info } |
| Success: | HTTP/1.1 200 OK “Config set.” |
| Failure: | HTTP/1.1 204 NO\_CONTENT “Nothing to set in the config.” |

Using this method, an existing config is deleted.

|  |  |
| --- | --- |
| Request: | DELETE /Service/WifiControl/Config/<SSID> |
| Success: | HTTP/1.1 200 OK “Config destroyed.” |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Unsupported DELETE request.” |

### State operations

Using this method to scan available AccessPoints to connect with.

|  |  |
| --- | --- |
| Request: | PUT /Service/WifiControl/Scan |
| Success: | HTTP/1.1 200 OK “Scan started.” |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Unsupported PUT request.” |

Using this method to connect (or start) an AccessPoint with an SSID using the following command.

|  |  |
| --- | --- |
| Request: | PUT /Service/WifiControl/Connect/<SSID> |
| Success: | HTTP/1.1 200 OK “Connect started.” |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Unsupported PUT request.” |

Using the next method the connected SSID is disconnected or an Access Pooint is taken offline..

|  |  |
| --- | --- |
| Request: | DELETE /Service/WifiControl/Connect/<SSID> |
| Success: | HTTP/1.1 200 OK “Disconnected.” |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Unsupported DELETE request.” |

Using this method to store the current configuration.

|  |  |
| --- | --- |
| Request: | PUT /Service/WifiControl/Store |
| Success: | HTTP/1.1 200 OK “Store started.” |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Could not store the information” |

Using this method to store the current configuration.

|  |  |
| --- | --- |
| Request: | PUT /Service/WifiControl/Debug/<debug-level> |
| Success: | HTTP/1.1 200 OK “Debug level set.” |
| Failure: | HTTP/1.1 400 BAD\_REQUEST “Unsupported PUT request.” |

## Events

Events are autonomous events, triggered by the internals of the plugin. These events will be broadcasted as JSON to all the connected web socket connections that where opened to this plugin.

## JSON definitions

### General information (\_info)

|  |  |
| --- | --- |
| event | [enum] Type of wifi event.  Values: “Connected”, “Disconnected”, “NetworkUpdate”. |
| Hidden | [bool] true in case the browser is not visible (hidden) on screen. |
| suspended | [bool] true, in case the client is in a suspended mode. All system critical resources have been relinquished |