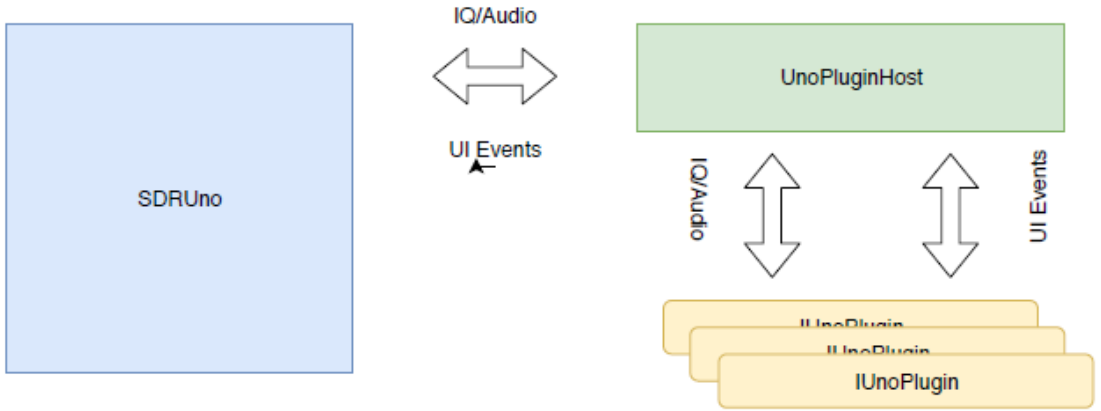
SDRuno Plugin System

Developer Pack

V0.1 27th May 2020

SDRuno 1.4 Plugin API Architecture

- SDRuno delivers and reacts to events to/from the plugin host via callbacks
- The main application has no inherent concept of plugins

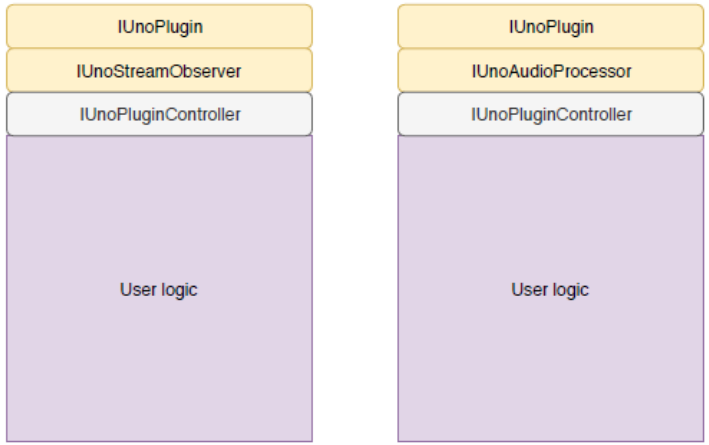


UnoPluginHost

The UnoPluginHost is the translation layer between the main application and plugins

It is loaded dynamically by SDRuno to remove dependency. SDRuno needs only to understand how to talk to the plugin host.

It is a bi-directional proxy. The decoupling is intended to provide scope to make interactions asynchronous for the avoidance of performance problems.



IUnoPlugin

Plugins implement well defined interfaces from the API. A plugin controller object is provided by the plugin host to each individual plugin.

Plugins can optionally subscribe to the output of various stages of the DSP processing pipeline.
A callback in the plugin defined as part of the overridden interface is the entry point.

Plugin Development Files

GitHub – https://github.com/SDRplay/plugins

/include – Plugin System Header Files
/nana – Nana UI Library (see below)
/resources – SDRplay image files for plugin background
/SDRunoPlugin_Template – Visual Studio 2017 solution
/SDRunoPluginsDeveloperPack.pdf – This document

Nana UI is a cross platform open source UI library and included for convenience.

Main Concepts

- Read/Modify SDRuno's IQ stream
- Read/Modify SDRuno's audio stream
- Set/Get SDRuno properties
  - Including using SDRuno ini file for settings (Set/GetConfigurationKey)
- Annotate on the SP1 Panel spectrum display
- Receive events from SDRuno

Register/Unregister Functions

- RegisterStreamObserver
- RegisterStreamProcessor
- RegisterAudioObserver
- RegisterAudioProcessor
- RegisterAnnotator

- UnregisterStreamObserver
- UnregisterStreamProcessor
- UnregisterAudioObserver
- UnregisterAudioProcessor
- UnregisterAnnotator

Get Functions

- GetDemodulatorType
- GetVfoFrequency
- GetCenterFrequency
- GetFilterBandwidth
- IsStreamingEnabled
- GetSampleRate
- GetAudioSampleRate
- GetSquelchLevel
- GetSquelchEnable
- GetAgcMode
- GetAgcThreshold
- GetNoiseBlankerLevel
- GetNoiseReductionLevel
- GetCwPeakFilterThreshold
- GetFmNoiseReductionEnable
- GetFmNoiseReductionThreshold
- GetWfmDeemphasisMode
- GetAudioVolume
- GetAudioMute
- GetSNR
- GetPower
- GetConfigurationKey

Set Functions

- SetDemodulatorType
- SetVfoFrequency
- SetCenterFrequency
- SetFilterBandwidth
- IsStreamingEnabled
- SetSampleRate
- SetSquelchLevel
- SetSquelchEnable
- SetAgcMode
- SetAgcThreshold
- SetNoiseBlankerLevel
- SetNoiseReductionLevel
- SetCwPeakFilterThreshold
- SetFmNoiseReductionEnable
- SetFmNoiseReductionThreshold
- SetWfmDeemphasisMode
- SetAudioVolume
- SetAudioMute
- SetConfigurationKey

Additional Functions

- RequestUnload

Events

- DemodulatorChanged
- BandwidthChanged
- FrequencyChanged
- CenterFrequencyChanged
- SampleRateChanged
- StreamingStarted
- StreamingStopped
- SquelchEnableChanged
- SquelchThresholdChanged
- AgcThresholdChanged
- AgcModeChanged
- NoiseBlankerLevelChanged
- NoiseReductionLevelChanged
- CwPeakFilterThresholdChanged
- FmNoiseReductionEnabledChanged
- FmNoiseReductionThresholdChanged
- WfmDeemphasisModeChanged
- AudioVolumeChanged
- AudioMuteChanged
- SavingWorkspace

Annotator Structure

- Array of structs
- Struct contents
  - frequency (x location)
  - power (y location)
  - text (to be displayed)
  - style (see below)
  - rgb (RGB colour)
- Style
  - AnnotatorStyleFlag
  - AnnotatorStyleBox
  - AnnotatorStyleMarker
- If the annotator has been registered and the array of structs is not null then periodically the array will be cycled through. If frequency[i] and power[i] are visible in the SP1 panel spectrum display, then the specified text[i] will be displayed

Our Plugin Roadmap

- DAB/DAB+ (Now)
- Audio Recorder – PCM WAV and MP3 output (Now)

- ADS-B
- DX Cluster
- MPX output – to interface with RDS Spy
- Direction Finding – to work with the RSPduo