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Subject Area	Software

Hex Browser

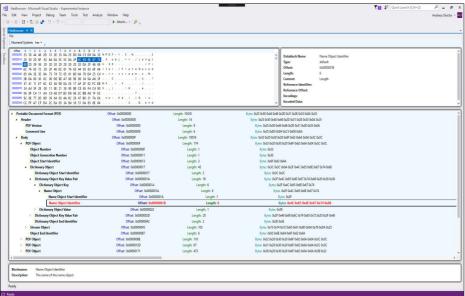Reference peeking and jumping feature

Decoding feature

Introduction: Computers only understand binary information, which is hard to understand for humans. Even computer scientists have a hard time analysing binary data. Programs to view and edit binary data are called "Hex Editors". Currently existing editors have basic features like reading the file and writing into it, but lack semantic analysis. For certain file formats, there are binary interpreters but they are limited to their file format. The goal for this project is a hex editor, which is compatible to every file format.

Result: Because the tool understands the semantics of the given file format, it has unique and more advanced features than a regular editor. Two of these unique features are reference jumping and special encodings. Very often, there are references to other positions within the file, such as object references or string table references. Due to this reference jumping, the tool is called Hex Browser. This browser can detect such references and provide a function to peek or even directly jump to the reference.

Many file formats also compress data with special encodings to save memory or to increase security. This encoded data is completely unreadable. The Hex Browser can decode such data and present them, which makes the understanding of the content possible.

To display the semantic information and to accomplish the features above, the tool needs to understand the file format. In order to handle the very different file formats, an API (application programming interface) is made to extend the Hex Browser with any file format. As proof of concept, ELF (Executable and Linkable Format for Unix) and PDF (Portable Document Format) are implemented.

Visual Studio 2017 Plug-in: Hex Browser