

1 Introduction

The goal of this diploma thesis is to extend the Java USB API to the Windows operating system as a part of the open source project jUSB [18].

This documentation presents an overview of the universal serial bus (USB) to provide the fundamental understanding of the Java USB API. Common USB terminologies are also explained in detail.

The concept of the jUSB API for Windows will be introduced which includes a presentation of the USB driver stack for Windows and the principal framework of the Java USB API.

The design approach to implement the `usb.windows` package for the Java USB API is separated into two parts. One part deals with the enumeration and monitoring of the USB while the other part looks into the aspects of communicating with USB devices in general. Both parts are implemented using Java Native Interface (JNI) to access native operation on the Windows operating system. The jUSB dynamic link library (DLL) provides the native functions that realise the JNI interface of the Java `usb.windows` package.

Communication with an USB device is managed by the jUSB driver. The structures and important aspects of the jUSB driver are introduced in chapter 6. The chapter itself is a summary and covers only some fraction of the driver implementation. A lot of useful information about driver writing and the internal structures can be looked up in Walter Oney's book "Programming The Microsoft Driver Model" [4].

A lot of important programs and resources are used to work with the Java USB API for Windows project. Therefore, two chapters have been included to simplify the installation for end users and developers.

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