Chapter 1
Introduction

1.1 Motivation

The motivation for the Universal Serial Bus comes from three interrelated considerations:

- **Connection of the PC to the telephone**
  It is well understood that the merge of computing and communication will be the basis for the next generation of productivity applications. The movement of machine-oriented and human-oriented data types from one location or environment to another depends on ubiquitous and cheap connectivity. Unfortunately, the computing and communication industries have evolved independently. The Universal Serial Bus provides a ubiquitous link that can be used across a wide range of PC to telephone interconnects.

- **Ease of use**
  The lack of flexibility in reconfiguring the PC has been acknowledged as the Achilles heel to its further deployment. The combination of user friendly graphical interfaces and the hardware and software mechanisms associated with new generation bus architectures like PCI, PnP ISA, and PCMCIA has made computers less confrontational and easier to reconfigure. However, from the end user point of view, the PC's I/O interfaces such as serial/parallel ports, keyboard/mouse/joystick interfaces, etc., do not have the attributes of plug and play.

- **Port expansion**
  The addition of external peripherals continues to be constrained by port availability. The lack of a bi-directional, low-cost, low-to-mid speed peripheral bus has held back the creative proliferation of peripherals such as telephone/fax/modem adapters, answering machines, scanners, PDA's, keyboards, mice, etc. Existing interconnects are optimized for one or two point products. As each new function or capability is added to the PC, a new interface has been defined to address this need.

  The Universal Serial Bus is the answer to connectivity for the PC architecture. It is a fast, bi-directional, isochronous, low-cost, dynamically attachable serial interface that is consistent with the requirements of the PC platform of today and tomorrow.

1.2 Objective of the Specification

This document defines an industry standard Universal Serial Bus. The specification describes the bus attributes, the protocol definition, types of transactions, bus management, and the programming interface required to design and build systems and peripherals that are compliant with this standard.

The goal is to enable such devices from different vendors to inter-operate in an open architecture. The specification is intended as an enhancement to the PC architecture spanning portable, business desktops, and home environments. It is intended that the specification allow system OEMs and peripheral developers adequate room for product versatility and market differentiation without the burden of carrying obsolete interfaces or losing compatibility.

1.3 Scope of the Document

- **Target audience**
  The specification is primarily targeted to peripheral developers and system OEMs, but provides valuable information for platform operating system/ BIOS/ device driver, adapter IHVs/ISVs, and platform/adapter controller vendors.
- **Benefit**
  This version of the Universal Serial Bus specification can be used for planning new products, engineering an early prototype, and preliminary software development. All final products are required to be compliant with the Universal Serial Bus Specification 1.0.

1.4 Document Organization

Chapters 1 through 5 provide an overview for all readers, while Chapters 6 through 11 contain detailed technical information defining the Universal Serial Bus.

Peripheral implementers should particularly read Chapters 5 through 11.

Universal Serial Bus Host Controller implementers should particularly read Chapters 5, 6, 7, 8, 10, and 11.

Universal Serial Bus device driver implementers should particularly read Chapters 5, 9, and 10.

This document is complemented and referenced by the following related documents, which will be released shortly:

- The *Universal Serial Bus Device Class Specification*
- The *Universal Serial Bus Design Guide*

Please contact the USB Implementers Forum for further details.

Readers are also requested to contact operating system vendors for operating system bindings specific to the USB.