

Input Standardization

Harish Kulkarni

AI&R Enable

Enable Team

Technologies for people with disabilities

Hands Free

ALS & motor and speech impairments

Soundscape

Vision impairment



Standardization for Universal Access

How can standardization facilitate the development of effective user interfaces to allow everyone, including persons with disabilities to benefit of TV services?

Levels of Standardization

- Hardware interfaces
 - Mechanical interfaces
 - Electrical / Electronic interfaces
- Software Interfaces
 - Firmware
 - API Layers
 - Development Libraries
- Protocols
- Data interchange formats

Human Interface Devices

- Origins in USB-HID
 - Now also over Bluetooth / BLE, Serial, I2C, etc.
- Human control over computing devices
 - Compact
 - Extensible
 - Self describing
 - Supports nesting and collections
- Nearly universal usage for devices
 - Keyboard, Mouse, Pen, Touch, Game Controllers

Standardization for Eye Trackers

- Industry partners
 - Tobii
 - EyeTech
- Ratified in January 2018
- Supported in Windows 10

Levels of Standardization

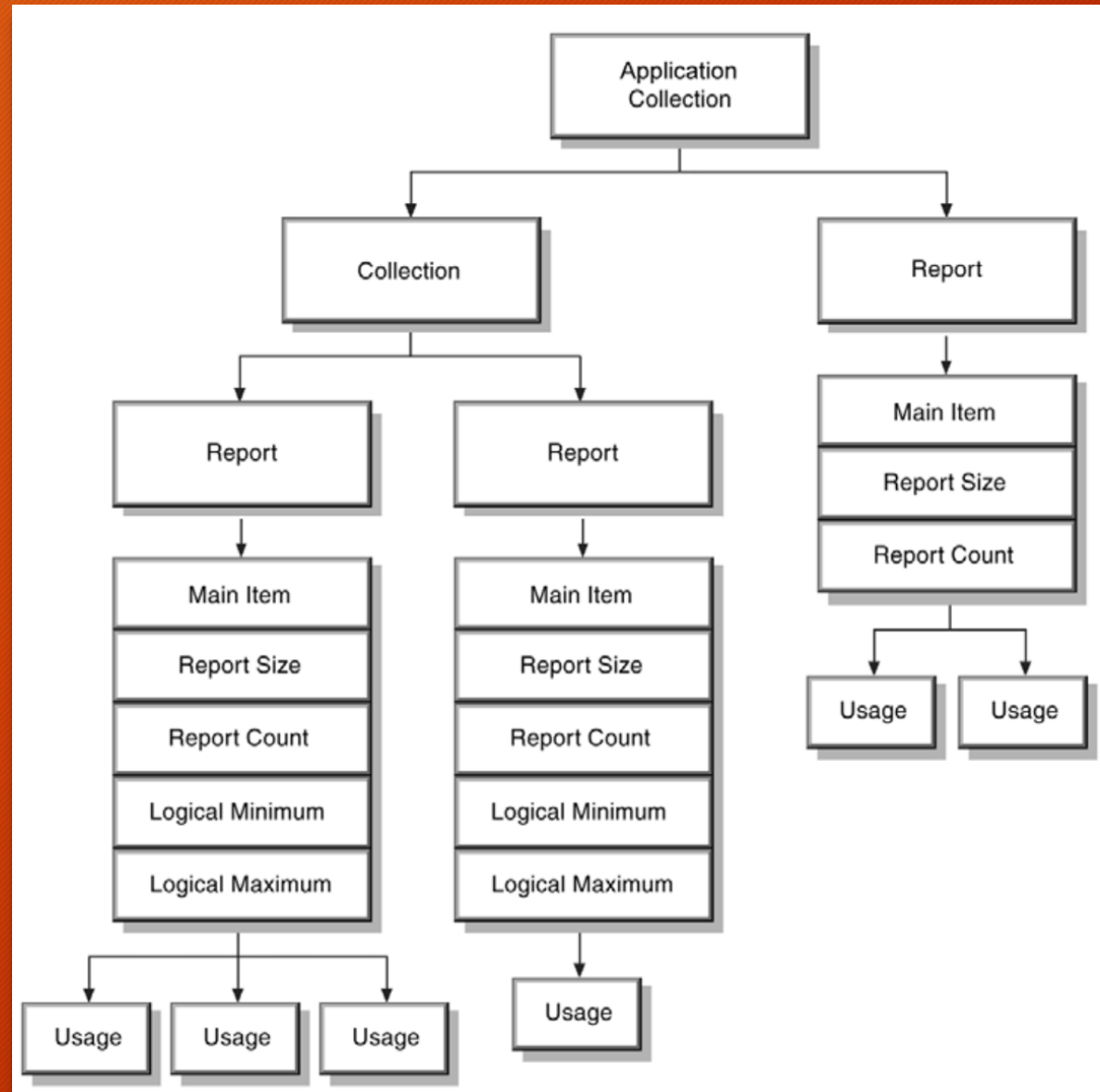
- Firmware
- Software / Driver
- OS Apis
- Application Libraries

Firmware

- USB Descriptors
 - Device, Configuration, Interface
- HID Descriptors
 - Report Descriptor
 - Physical Descriptor
- Descriptor Format
 - Array of Items
 - Tag, Type, Size

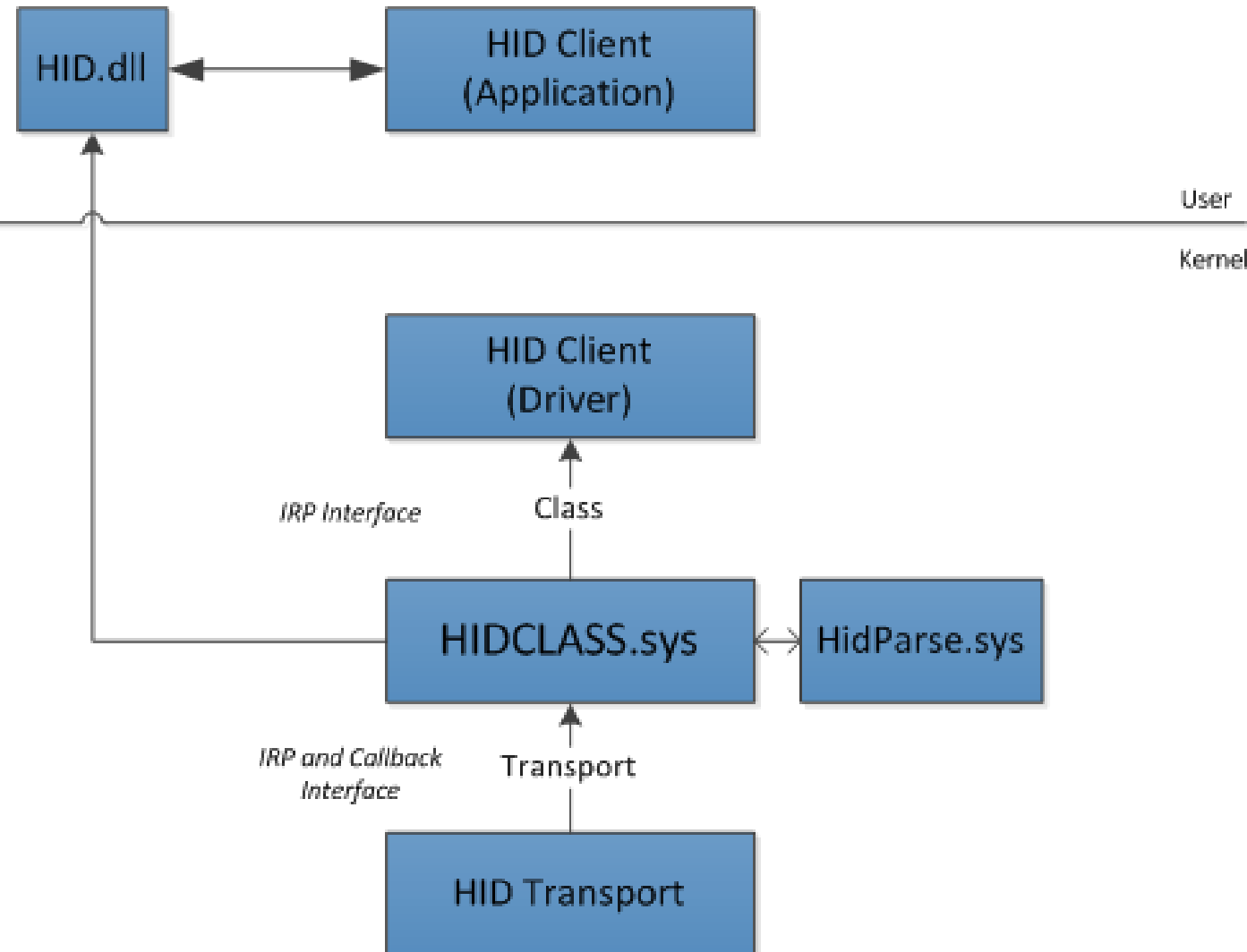
Report Structure

- Collections
 - Application
 - Logical
 - Physical
- Items
- Usages



Software

- Client drivers
 - Kernel mode
 - User mode



OS Apis

- Layered approach
 - Generic HID Apis
 - Device class specific APIs
 - Framework APIs

Framework support

- Higher level abstraction
- User scenario focused

Summary

- Layered approach
- Standardization at layer boundaries
- Innovation and experimentation inside layers