USB for Portable Devices
**USB for Desktops**

- **USB was first introduced as a solution to desktop interconnectivity**
- **At the time, desktops had a number of different wired interfaces**
  - Printer, mouse, keyboard, serial, parallel, PS2
- **USB was very successful in replacing these wired interface ports, and has now become the de facto industry standard**
- **The success of USB in the desktop space has caused a number of portable devices to also adopt USB**
USB for Portable Devices

- Virtually every portable device now uses USB for PC connectivity
- USB-IF is now expanding the functionality of USB in a portable device to include features like:
  - Charging
  - Host
  - Headset
  - Video
- The USB-IF is committed to addressing new requirements for portable device interfaces as they emerge
USB-IF Initiatives for Portable Devices

- The USB-IF has addressed and is addressing portable device requirements through the following efforts:
  - Micro-USB
  - On-The-Go
  - Battery Charging
  - Embedded Host
  - Audio Headset
  - Video Display
  - Media Transfer Protocol
  - Mass Storage
  - Serial Link PHY interface

- Industry participation in these activities is key to their success

- The goal of these efforts is to promote and support USB as a standard universal interface for portable devices
Micro-USB for Portable Devices

- Industry standard
  - Broad acceptance
  - Follow on to the widely accepted Mini-USB
- Mechanically suitable for mobile devices
  - Small size
  - Durable (>10,000 cycles)
  - Improved Latching
- Replaces multiple other connectors
  - Data, charging, audio, video, diagnostics
- Future looking
  - Features designed for USB 2.0 will map to USB 3.0
USB Battery Charging

Mobile device charges from host:
- Charge at 500mA on today’s PCs and hubs
- Charge at 1.5A on future host chargers
- Dead battery charging without enumeration

Mobile device charges from USB charger:
- Dedicated low-cost USB charger design
- Charge at up to 1.5 A

Mobile device charges from docking station:
- Mobile device acts as host
- Charges instead of having to provide power to downstream devices
USB On-The-Go

- OTG enables portable devices to communicate directly with USB peripherals or each other
- OTG enables efficient power management of the portable interface
- Devices that need to attach to PCs and other accessories can do both over the same connector
- Enables high volume, low cost accessories by standardizing the interface between device and accessory
- New devices and accessories can be developed with the same interface
USB Audio Headset

- Audio Headset group defining a standard interface between a phone and a USB digital headset
- Headsets will have a basic set of features that will work with all compliant phones
- Headsets can support additional features for advanced functions. For example, additional display or buttons for audio player functions.
- Extremely low USB current consumption
- Phones with USB headset support do not need a 2.5mm jack
- USB headset is a low cost/power alternative to BT
USB Video Display

- Display connectivity (e.g. HDTV)
  - USB Embedded Host in display will support video class
  - Widely recognised USB connectivity
  - UI control in mobile device or display
  - Display charges mobile peripheral

- Best user experience: Digital clear audio and video
  - Up to HDTV quality video sharing
  - Hi-resolution photo, combined with digital music
  - Charging
USB Embedded Host

- Enable connectivity between USB devices without going through PC

- Embedded host ports:
  - Have a specific set of supported features. Do not need all the functionality of a PC.
  - Have a specific set of supported peripherals. Targeted peripheral list

- Examples include USB host ports on:
  - Car stereos, video displays, set top boxes, printers
**Industry Support for USB in Portable Devices**

- Open Mobile Terminal Platform (OMTP) forum has endorsed Micro-USB as the standard connector for portable cell phones.

- China Electronics Standardization Institute (CESI) is looking at requiring all portable cell phones to use the Micro-USB connector for its charging port.

- USB-IF has launched a number of standards and compliance efforts to optimize and enhance USB for the portable market, and is committed to addressing new requirements as they emerge.
Portable Device Migration

• Today’s Handset is a PC and then some
  – Multi-gigabyte memory capacity
  – Multiple processors and co-processors
  – Multiple wireless interfaces (CDMA, GSM, UMTS, WiFi, GPS, FM)
  – Digital Still and Video camera functions
  – Multi Media Players
  – Full function OS (WinMobile, Symbian, Linux)
  – Desktop equivalent applications (Word, Powerpoint, Excel, Outlook)

• Just as PC’s benefit from a standard wired interface, so will portable devices