

**KCodes
USB Device
Software Solution**

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Summary I

- In 2009, over 1.1 million 11n routers and NASs are expected to be shipped with KCodes firmware module
- Start to see telco tenders for DSL router and Integrated Access Device require USB host ports to support multifunction printer, storage, and 3G datacard
- USB over IP greatly increases printer compatibility and assists in bypassing NTFS patent issues
- Brand customers need only to decide on UI policy issues. KCodes resolves all technical and testing issues with ODMs
- Actively discussing with major notebook brands in Taiwan and Japan to bundle IP USB Hub with compact notebooks with few USB host ports, to increase USB device connectivity over LAN and WIFI
- Mobiles users no longer need to go through the hassles of connecting USB devices' cables
- Two software licenses:
 - Virtual USB Host (on Windows/MacOS) + Virtual USB Device (on router/NAS, footprint 75Kbytes: supports all USB devices
 - Small Footprint SMB (footprint 270Kbytes)+FAT R/W+NTFS R+CDFS+UDF (developed by KCodes in-house): recommended for USB hard drive, flash drive, digital camera, CD/DVD
- USB over IP is a high entry barrier technology
 - need to harmonize USB (with timing constraints) with IP (with delays)
 - need to harmonize with many Windows/MacOS USB devices drivers
- Proven compatibility of USB devices accumulated since 2005 with deployment all over the world

Summary II

- Enables the USB host port of router and NAS to support
 - Printer, Fax, Scanner: USB over IP
 - Hard Drive, Flash Drive, Digital Camera
 - NTFS: USB over IP to bypass patent issues
 - FAT32: Small Footprint Samba
 - iPod/iPhone: USB over IP to support syncing with remote iTunes
 - CD, DVD
 - Sharing Content: Small Footprint Samba on CDFS and UDF
 - Burning CD/DVD: USB over IP
 - Speaker: USB over IP to stream PC music to speaker, codec independent and bypasses MP3 patent issues
- Virtual USB Host
 - Consists of driver and GUI. GUI control can be completely customized
 - Provided as an executable, or
 - Provided as a DLL implementing only UI mechanism. Buffalo can program the UI policy.
 - Supports Windows XP, Vista, 2000, 2003, 7, 32-bit and 64-bit and MacOS 10.4, 10.5, 10.6, PowerPC and Intel
- Virtual USB Device
 - Just one line of code to insert Virtual USB Device kernel module in router and NAS
 - Supports Linux, eCos, and other operating systems