



Assumed ATA Charter

- **Lowest cost**
- **Plug and play compatibility**
- **Highest performance**
- **Internal peripherals**

MS: A/K: J: C: : PRODUCT SYSTEM



Enhancing ATA's Capabilities

- **Non-disk peripherals**
 - ◆ ATAPI CD-ROM [done]
 - ◆ ATAPI Tape [done]
- **PCI Bus Master DMA [done]**
- **Command/device vs. command/channel**
 - ◆ Multi-thread [proposal phase]
- **Commands/device vs. command/device**
 - ◆ Command queuing [proposal phase]



Why?

■ Multi-thread

- ◆ **Increase performance**
 - More I/O's per channel
- ◆ **Reduce cost**
 - OEMs ship 1 cable instead of 2
 - Saves \$0.50 to \$1.00

■ Command queuing

- ◆ **Increase performance**
 - Reduce seek and rotational latency effects
 - Reduce command overhead effects



Operating System Device Drivers

- **Key enabler for all new hardware technology**
- **Latest ATA driver capabilities**
 - ◆ **ATA disk**
 - ◆ **ATAPI CD-ROM**
- **New technology for next ATA driver release**
 - ◆ **ATAPI Tape**
 - ◆ **PCI Bus Master DMA**
 - ◆ **Multi-thread**
 - ◆ **Command queuing**
- **Prefer BIOS to report/enable hardware capabilities**
 - ◆ **Plug and Play BIOS**



Multi-thread & Queuing Goals

- **Standard capabilities reporting**
 - ◆ **ATA Identify Drive and ATAPI Identify Device**
- **Standard capabilities enabling**
 - ◆ **Set Features**
- **Compatibility**
 - ◆ **Existing host controller/bridge hardware**
 - ◆ **Existing task file register space**
 - ◆ **Existing PCI Bus Master DMA**
 - ◆ **Edge triggered interrupts**
- **Ease Multi-peripheral driver integration**
 - ◆ **Single solution for ATA and ATAPI**
 - ◆ **Automate new protocols in device hardware LSI**
 - **Interrupt Service routines will handle**



Suggested Multi-thread & Queuing Process

- **Goal setting**
- **Proposal phase**
- **Industry review**
 - ◆ **Device driver developers**
 - ◆ **BIOS developers**
 - ◆ **System OEMs**
 - ◆ **Peripheral suppliers**
 - ◆ **LSI suppliers**
 - ◆ **Public**
- **Consensus around a single proposal**
- **Implementation phase**
 - ◆ **LSI**
 - ◆ **Peripherals**
 - ◆ **BIOS**
 - ◆ **Drivers**