Assumed ATA Charter

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