

1394-1995 Futures

**Scott Smyers
Director
Sony Research Laboratories**

IEEE 1394 Futures

- ◆ **Trade association activities**
 - **AV working group**
 - **PC working group**
 - **Architecture working group**
- ◆ **Standards activities**
 - **IEEE 1394a Activity**
 - **IEEE 1394.1 Activity**
- ◆ **1394 devices**

1394 Trade Association

- ◆ **Audio/Video Working Group**
 - **Continuation activity of Digital Video Consortium**
 - **Command delivery protocol**
 - **Consumer Audio/Video command set**
 - **Register level connection management**
 - **Carrying SD format video on 1394**
 - **Carrying MPEG on 1394**
 - ...
 - **Consumer audio command sets & data formats**

1394 Trade Association (cont)

- ◆ **Camera Working Group**
 - 1394 conferencing camera protocols
- ◆ **PC Working Group**
 - Power distributions rules
- ◆ **Architecture Working Group**
 - Compliant optimizations that require no changes to 1394
 - Reset and arbitration optimizations
 - Some of these changes make it into 1394a
- ◆ **Marketing, Packaging, Silicon, etc.**

1394 Power Distribution

- ◆ **Presented by Compaq to 1394 Trade Association PC Working Group**
- ◆ **Defines rules for peripheral and host devices**
- ◆ **Does not define anything for portable computers**
 - **Deliberately out of scope because they are at once bus managers, peripherals, power sources, power sinks and probably a few other things**

1394 Power Classes (i.e., types of devices)

- ◆ **Power Provider**
 - puts power on 1394 bus
- ◆ **Power Repeater (self powered)**
 - repeats power, does not provide nor sink 1394 bus power
- ◆ **Power Consumer**
 - uses 1394 bus power

Power Provider Rules

- ◆ **Reports power capabilities in SelfID packet**
 - **As defined in 1394 standard**
- ◆ **Provides no more than 33V max**
- ◆ **Does not repeat power (this means diodes)**
- ◆ **Device may have any number and type of connectors**
 - **6 pin connectors - must source power on each one**
 - **4 pin connectors**

Power Repeater Rules

- ◆ **Shall be self powered**
 - **Shall not provide bus power**
 - **Shall not sink any bus power, *ever***
- ◆ **Shall implement software controlled power (link on/off as defined in 1394 standard)**
- ◆ **Shall not mix connector types**
 - **PC peripherals may have any number of 6 pin connectors**
 - **A/V devices may have any number of 4 pin connectors (such devices are self powered, but not power repeaters!)**

Bus Powered Rules

- ◆ **Completely powered from the 1394 bus**
- ◆ **Shall have exactly one connector**
- ◆ **Shall draw less than 1W after initially connecting to 1394**
- ◆ **May draw up to 3W after receiving a link_on**
- ◆ **May draw more power to become fully operational**

IEEE 1394a

- ◆ **Activity is restricted to only fully backward compatible extensions to IEEE 1394**
- ◆ **Active Work Items:**
 - **Incorporate already defined compatible extensions to IEEE 1394:**
 - **Arbitrated short reset**
 - **Common Isochronous Packet Header (tag=1)**
 - **CSR definitions for consumer protocols**
 - **Plug Control Registers**
 - **Function Control Request/Response Registers**

IEEE 1394a (cont)

- ◆ **High Speed Extensions !**
- ◆ **Open ended speed upgrade**
- ◆ **Initial focus is 800Mbps and 1.6Gbps**
- ◆ **Upgrade definition is open ended (scalable to 3.2Gbps, and higher)**
- ◆ **Fully backward compatible**
- ◆ **(Retains 1394 requirement that higher speed PHYs shall be capable of communicating at all lower rates)**

IEEE 1394.1

- ◆ **Protocols for 1394 to 1394 bridges**
 - **Auto-configuration of busIDs**
 - **Asynchronous communications between devices on different buses**
 - **Routing of isochronous data**
- ◆ **Defines additional CSR registers**
- ◆ **Fully compatible with first generation 1394 devices**

IEEE 1394 Devices

- ◆ **Sony Digital Video products**
 - **DCR-VX1000**
 - **DCR-VX700**
 - **New passport-sized camcorder**
 - **Digital VCR**
- ◆ **All completely DVC compliant, including digital interface**
 - **(DVC “Blue Book” specifies IEEE 1394 as the digital video connection)**

IEEE 1394 Devices (cont)

- ◆ **Sony ISA to 1394 video capture card**
 - **Capture and edit DV format video data from DV products**
- ◆ **Professional video editing cards and software**
 - **Adaptec/DPS**
 - **Miro/Skipstone**
- ◆ **Yamaha digital audio products**
 - **Announced for availability in 1997**
- ◆ **JVC announced 1394 as the digital interface for Digital VHS**

IEEE 1394 Devices (cont)

- ◆ **Sony DSM250 digital communications camera**
 - **Implements digital camera protocol**
 - **Programmable frame sizes from 160x120 to 640x480**
 - **Programmable frame rates from 3.75 fps to 30 fps**
 - **Programmable color resolution from 8 to 24 bits per pixel**

IEEE 1394 Devices (cont)

- ◆ **PCI host adapters and/or controllers (in alphabetical order):**
 - **Adaptec**
 - **Sony**
 - **Symbios**
 - **Texas Instruments**
- ◆ **Sony Camlink chip for DVCR and Camcorder embedded applications**
- ◆ **PHYs**
 - **IBM, Sony, TI ... others?**

IEEE 1394 Devices (cont)

- ◆ **Other 1394 products:**
- ◆ **Many !**

Other 1394 News

- ◆ **VESA Home Network standards committee has defined 1394 as home network standard**
- ◆ **EIA R4.1 has defined 1394 for connection to Advanced TV**
- ◆ **DAVIC has adopted 1394 for interconnecting home electronics devices**

Other 1394 News: Device Bay !

- ◆ **Common expansion for PCs**
 - **Microsoft's vision for the future sealed PC**
- ◆ **Definition specifies 1394 for connection to mass storage**
 - **Hard Disks, CDROM, DVDROM, etc !**
- ◆ **Sponsored by:**
 - **Compaq**
 - **Intel**
 - **Microsoft**